POSITION STATEMENT

Dysphagia Diagnosis and Treatment: A Multidisciplinary Challenge

3rd Congress of European Society for Swallowing Disorders, Malmö, Sweden, 12–13 September 2013

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ESSD Position Statements

Paediatric Dysphagia

Plan

- Definition
- Categories
- Guidelines for assessment and management

First of all several definitions have to be stated

Definitions

- In paediatric dysphagia:
 - Swallowing disorders
 - Feeding disorders

Swallowing Disorders (SD) is the term used in this position statement because Oropharyngeal Dysphagia (OD) in paediatrics and oesophageal dysfunction are intrinsically linked so this term does not include feeding disorders.

Definitions: The Different Stages in Paediatric Development

- Newborn: infant born at term, with a birth weight of around 3.5 kg
 Preterm
 - By age: (define PMA or GA)
 - Extremely pre-term is below 28 weeks
 - Very preterm is 28–32 weeks
 - Moderate/late pre-term is 32–37 weeks
 - By weight: Less than 2.5 kg
 - VLBW = 1.0–1.5 kg
 - ELBW = up to 1.0 kg
- · Neonate: a baby who is aged 28 days and below
- Infants: under 2 years of age
- Children: under 18 years of age

The American Academy of Paediatrics (2004) recognised this problem over a decade ago with a call for consistency in the use of definitions to describe the length of gestation and age in neonates.

Proposition plan for each category

- The main points of the problem (the main aetiologies, the prognostic factors ...)
- Statement on screening
- Statement on assessment
- Statement on management of disorders and complications
- Statement on the multidisciplinary team

Swallowing Disorders in Preterm

Screening and Assessment

- When:
 - At the time of transition from tube feeding to oral feeding, readiness for oral feeding must be assessed using a valid and reliable clinical tool. Currently there is no consensus for a specific instrument.
 - Screening should be performed during the first 2 years of life by use of paediatric checklist of children's eating difficulties and a feeding observation.
 - In case of swallowing disorders where aspiration is suspected an instrumental evaluation has to be performed.
- How:
 - Observation of infant states, sucking, feeding skills during meal (breast or bottle feeding) and parent-infant interactions
 - In NICU (neonatal intensive care unit) assessment has to be performed using a Developmental Care approach (Als 1984): morbidity, behavior, sucking, feeding skills
 - After leaving neonatal care the screening should be performed by the infant's pediatrician preferably during a routine visit by a meal observation
 - Instrumental assessment should be used judiciously
 - Validated feeding scales are recommended
 - Changes in infant feeding should be reported using validated scoring systems

Management

- In NICU: there is no consensus regarding specific sensorimotor interventions
 - Oral and non-oral sensorimotor interventions appear to improve oral feeding performance in preterm infants and



could shorten the transition time to independent oral feeding in preterm infants.

- The modality of intra-oral stimulations are discussed because oral hypersensitivity or defensiveness are very common during the first life in preterm and may interfere feeding skills' development.
- After leaving hospital these infants remain at risk, therefore:
 - Education on feeding and swallowing should be provided by a specialist multi-disciplinary team.
 - It is important to help families
 - to understand better what are swallowing disorders
 - · to manage difficulties already present
 - to prevent feeding skills delay and aversive feeding behavior

Swallowing disorders in infant

Problem

- Main points
 - SD may be secondary to disease but also to immaturity, so the diagnosis is an ongoing process.
 - Management of swallowing disorders and nutrition must be aggressive and immediate, because of the reduced nutritional reserve which impedes the weight gain and growth, reduces the defence mechanism against infection, and can influence the infant's psychomotor and intellectual development.
 - SD in infants affects not only somatic development but also oromotor and psychomotor maturation.
- Main causes may be: neurologic, anatomic, secondary to systemic illness or to resolved medical conditions, a genetic syndrome, psycho-behavioural
- Low birthweight infants are at high risk of SD

Multidetermined disorders/Multiaxial diagnosis

Screening

- Screening is not systematic but determined by diagnosis such as cleft palate, Pierre Robin sequence, PraderWilli Syndrome, low birthweight, perinatal stroke...
- Screening will be performed by observation of a meal.
- In case of neurologic disease this screening may be planned regularly for instance twice during the first year of life and a minimum of once a year after.
- When aspiration is suspected a swallowing assessment has to be done.

Assessment

- How:
 - In all cases, the diagnosis must be thorough and accurate.
 - The clinical evaluation of SD is an evolving process including swallowing disorders and the ensuing consequences.
 - The assessment tool focusing on swallowing may be:
 - a feeding test or meal observation with validated scales
 - an instrumental assessment with FEES, or videofluoroscopy
 - Appropriate timing for follow up testing is required with videofluoroscopy before 2 years of age and with FEES for the older child if necessary.

- The assessment for ensuing consequences consist of the follow up of health and nutritional status, neurodevelopmental skills and mother-infant interactions with validated scales.
- When:
 - For neonates and infants, with unknown pathology, an assessment is indicated when immature sucking skills, poor endurance for oral feeding and risk of aspiration (RGO, Bronchitis...) are noticed.
 - The clinical evaluation of SD being an evolving process, once management decisions are made clinicians and caregivers should monitor the infants.
 - During follow up, validated scales to measure skills should be used along side instrumental evaluation.
 - The frequency of follow up assessments decrease with the infant's age; the main stages being weaning development and prelinguistic acquisition about 8 and 18 months.

Management

- Parents are the first caregivers as they are involved in the diagnosis and the management of the disorders
- · Precursors are the same as for preterm infants
- If oral feeding is impossible, education is required on:
 - prevention of saliva's aspiration
 - Improving oral skills despite the lack of oral-feeding experiences with sensorimotor stimulations (flavour, smell, chewing toys...)
 - The Speech and Language Therapist can support the development of these skills
- In cases of modified food textures, caregivers and health providers have to compensate for the lack of sensation and for the impact of chewing and speech-motor acquisitions.
- It is recognized that thickeners and modified texture diets have some risks and it is important that the multi-disciplinary team work together to minimize the impact of these (dehydration, constipation, reduced appetite)

Swallowing disorders in children

Problematic

- The main points
 - Psychological maturation and feeding behavioural disorders are critical during this period
 - Anatomical changes and growth can impact on swallowing skills and increase difficulties e.g. cerebral palsy, myopathies...
- The main causes of SD
 - Tumour
 - Neurological disorders
 - Neurodegenerative diseases
 - Respiratory disorders
 - Digestive disorders
 - Disorders of the ear, nose and throat

Screening

- There is no systematic Screening
- In a population at risk, screening should be performed each year of life by a check list of children's eating difficulties and/or a feeding observation and should also involved a specific follow up of nutritional status

• In an acute situation, more in depth screening and assessment must be performed

Assessment

- When:
 - Specific symptoms of dysphagia
 - Recurrent pneumonia without aetiology
 - Failure to thrive
 - Behavioural feeding disorders e.g. Limited food texture tolerance, high level of food refusal, high level of parental stress managing the meal time
 - Severe acquired disorders
- How:
 - The assessment tool focusing on swallowing may be an instrumental assessment with FEES, or Videofluoroscopy
 - Manometry and or impedance testing may be indicated when a reflux or UOS dysfunction are Suspected
 - These instrumental assessments have to be performed after a specific clinical evaluation

Management

- Psychological dimension +++ Interaction child/parents
- Dietetic approach/nutritional status for growth needs
- Swallowing Re-education

Guidelines for assessment

Clinical assessment

- Oro-pharyngeal evaluation of:
 - Oromotor skills with validated scales such as
 - NOMAS[®] (neonatal oral-motor assessment scale) for infant before 1 month of life
 - POSP[®] (Oromotor assessment)
 - SOMA[®] for infants after 8 months
 - Feeding observation should collect:
 - duration of the meal
 - calorific intake
 - amount taken and milk-volume
 - interaction during the meal

Instrumental assessment

- FEES provides a dynamic view of the pharyngo-larynx during:
 - Respiration
 - Crying or phonation
 - Saliva management
 - Swallowing.
- VFS is unable to test sensitivity but can show:
 - Aspiration
 - Oesophageal motility.
 - Adaptations (e.g. modified textures, specific strategies to support the child etc...) and
 - Positioning to minimise risk

Multi-disciplinary team

- It is recognized that due to the complex nature of SD in children, team-working is essential to minimize the health and psychosocial risks
- The MDT should include a range of professional (e.g. Paediatrician, SLT, Physiotherapist, Occupational therapist, Dietitian, Specialist nurse, Respiratory therapist, Clinical psychologist, Specialist doctors (when appropriate), Dentist, Social worker, education professionals), Carers, and Parents
- Programmes for children with SD need to be written by the MDT and agreed by all involved. In addition all programmes need to be re-evaluated regularly
- Programmes need to consider a child's activity and participation

References

- Arvedson JC, Brodski L. 2002 Pediatric swallowing and feeding: Assessment and management II edition Thomson Learning
- Schindler O., Ruoppolo G. Schindler A. 2011. *Deglutilogia* II edition Omega edizioni
- Lau C et al. 2000
- Mizuno K. and Ueda A. 2003
- Premji et al., 2004
- McCain et al., 2001
- Als, 1984



Programme Overview

	WORKSHOPS-Skäne University Hospital, Mälmö				Pre-congress course Malmömässan	
	Electrical stimulation	VFS and FEE	VFS and FEES		THURSDAY, Sept 12	
07:30-08:00					Registration	
08:00-08:30						
08:30-09:00	REGISTRATION	REGISTRAT	ION		WELCOME	08:45-09:00
09:00-09:30	Physiology of OD	VFS-A	FEES-B	1	The dysphagia team:	09:00-10:00
9:30-10:00	Clinical Diagnosis: EAT10, VVST, VFS	The machine	The machine		The European experience J Regan.	
		The	The		The US experience JA Robbins	
10:00-10:30	Standard treatment: diet; posture, excercises	Procedure	Procedure	2	Neurology for the	10:00-11:00
		Interpretation	Interpretation		dysphagologist,R. Dziewas, S	
10:30-11:00	CNS strategies: r-TMS t-DCS	Coffee Break	10:45-11:00		Hamdy	
11:00-11:15	Coffee Break 11:00–11:15	FEES-A	VFS-B		Coffee Break 11:00–11:30	11:00-11:30
11:15-11:45	Peripheral strategies, sensory e-stim	The machine	The machine	3	Clinical history is crucial! P	11:30-12:00
		The	The		Pokieser	
11:45-12:15	Sensory peripheral e-stim in neurogenic dys.	Procedure	Procedure	4	Radiology for the dysphagologist	12:00-13:00
12:15-13:15	Neuromuscular Electrical Stimulation: Vitalstim therapy and currents	Interpretation	Interpretation			
13:15-14:00	LUNCH				LUNCH	13:00-14:00
14:00-15:00	Role of NMES in muscle re-education			5	CT-MR-PET for the dysphagologist K Abul-Kasim	14:00-14:30
15:00-15:30	Vitalstim electrode placement strategies			6	Esophagology for the dysphagologist R Shaker	14:30-15:00
15:30-15:45	Coffee			7	Psychiatric aspects of dysphagia M Bülow	15:00-15:30
15:45-16:30	Practical labs: Vitalstim electrode placement				Coffee	15:30-16:00
16:30-17:00	Case studies and Progressions			8	The physical examination J Regan	16:00-17:00
17:00-17:30	Discussion and closing				-	
17:30-18:00	-			9	Therapy: More than manoeuvres JA Robbins	17:00-18:00

		3rd ESSD Congress Malmömässan		3rd ESSD Congress Malmömässan	
		FRIDAY, Sept 13		SATURDAY, Sept 14	
7:30-8:00		Registration			
8:00-8:30	1	Pediatric dysphagia, position statements V Woisard, P. Fichaux-Bourin, M. Walshe	7	The European curriculum V WoisardThe US curriculum B Martin-Harris	
8:30-9:00	2	Dysphagia after treatment for head & neck cancer G LawsonA Schindler,			
9:00-9:30		B Martin-Harris. 2 scientific presentations	8	ESSD initiatives and guidelinesP Clavé, B.	
9:30-10:00				Hanson, J. Lewis, D. Smithard, R. Speyer	
10:00-10:30		Coffee and Poster Viewing Group A		Coffee and Poster Viewing Group C	
10:30-11:00	3	lcome (10 min) O. Ekberg, P. ClaveDysphagia after treatment for		UES—friend or foe?H Feussner, R Shaker	
11:00-11:30		head & neck cancer cont. G Lawson, B.Martin-Harris, A			
11:30-12:00		Schindler.Position statements			
12:00-12:30		LUNCH		LUNCH	
12:30-13:00		Fresenius-Kabi Symposium. Ben		Nutricia Workshop	
13:00-13:30		Hanson			
13:30-14:00	4	Feeding and respirationA H Cedborg, B Martin-Harris, E Verin.	10	GER, globus, phonastenia and dysphagiaD Farneti, JA Robbins, R Shaker	

		3rd ESSD Congress	Malmömässan			3rd ESSD Cong	gress Malmömässa	n
		FRIDAY, Sept 13				SATURDAY, S	Sept 14	
14:00-14:30								
14:30-15:00	5	Presbyphagia. Norm	al and abnormal swall	owing in the elderlyJA	11	Oral/Enteral fee	edingJ Ekstroöm, J	Lexell, C Stene
15:00-15:30		Robbins, R Shake	er					
15:30-16:00		Coffee and Poster V	iewing Group B			Coffee and Pos	ter Viewing Group	D
16:00-16:30	6	Scientific	Scientific	Scientific	12	Scientific	Scientific	Scientific
16:30-17:00		Presentation	Presentation	Presentation		Presentation	Presentation	Presentation
17:00-17:30		Diagnosis 1	Neur. Diseases	Miscellaneous		Diagnosis 1	HNC	Treatment
17:30-18:00		ESSD General asser	nbly			CLOSING CEF	REMONY	

Scientific Programme

Department of Radiology, Skane University Hospital

Workshop 1	Electrical	stimulation	in the	treatment	of	dysphagia
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Time	Title	Faculty
08:30-09:00	Registration	
09:00-09:30	Physiology of deglutition and pathophysiology of oropharyngeal dysphagia	Pere Clave
09:30-10:00	Clinical diagnosis	Laia Rofes Pere Clave
	Clinical diagnosis. EAT-10. VVST	
	• Videofluoroscopy	
10:00-10:30	Review of standard treatments	Pere Clave Radika Vasudeva
	• Adaptation of diet—changes in bolus rheology	
	• Posture; exercise and compensation techniques	
10:30-11:00	Central nervous system strategies	Shaheen Hamdy
	• rTMS (repetitive transcranial magnetic stimulation)	
	• tDCS (transcranial direct current stimulation)	
11:00-11:15	Coffee Break	
11:15-11:45	Peripheral strategies	Shaheen Hamdy Laia Rofes
	• Sensory electrical stimulation	
	• Intrapharyngeal/paired	
	• Transcutaneous	
11:45-12:15	Sensory peripheral electrical stimulation in neurogenic dysphagia	Eric Verin
12:15-13:15	Neuromuscular Electrical Stimulation: Vitalstim therapy and currents	Dinesh Verma
13:15-14:00	Lunch	
14:00-15:00	Role of NMES in facilitation muscle re-education	Dinesh Verma
15:00-15:30	Vitalstim electrode placement strategies-demonstration	Dinesh Verma—Radika Vasudeva
15:30-15:45	Coffee Break	
15:45-16:30	Practical Labs—Vitalstim electrode placements	Dinesh Verma—Radika Vasudeva
16:30-17:00	Case studies and progressions	Radika Vasudeva
17:00-17:30	Discussion and closing	

Faculty: Clave, Pere; Rofes, Laia; Hamdy, Shaheen; Verin, Eric; Verma, Dinesh, and Vasudeva, Radika Supported by Vitalstim by DJO Global

Workshops WEDNESDAY SEPTEMBER 11

	Group A	Group B
9:00-10:45	VFS	FEES
	1. How the machine works	1. How the machine works
	2. The procedure to obtain images from the patient (healthy volunteers)	2. The procedure to obtain images from the patient (healthy volunteers)
	3. Interpretation of the images	3. Interpretation of the images
	M Bulow, R. Olsson, P. Pokieser	D. Farneti, A. Schindler
10:45-11:00	Coffee break	
11:00-13:00	FEES	VFS
	1. How the machine works	1. How the machine works
	2. The procedure to obtain images from the patient healthy volunteers)	2. The procedure to obtain images from the patient (healthy volunteers)
	3. Interpretation of the images	3. Interpretation of the images
	D. Farneti, A. Schindler	M Bulow, R. Olsson, P. Pokieser

Faculty: Olsson, Rolf (radiologist) Sweden, Bulow, Margareta (SLP) Sweden, Pokieser, Peter (radiologist) Austria, Schindler, Antonio (ENT and phoniatrician) Italy and Farneti, Daniele (ENT and phoniatrician) Italy. Supported by PENTAX

SCIENTIFIC PROGRAMME	Precongress Course THURSDAY SEPTEMBER 12
08:45-9:00	Welcome—Room: Julia
	Bulow, Margareta; Clave, Pere
09:00-10:00	Session 1. The dysphagia team
	Moderator: Bulow, Margareta
	The European experience. Regan, Julie
	The US experience. Robbins, JoAnne
10:00-11:00	Session 2. Neurology for the dysphagologist
	Moderator: Clave, Pere
	Neurophysiology of human swallowing in health. Hamdy, Shaheen
	Pathophysiology of neurogenic dysphagia. Dziewas, Rainer
11:00-11:30	Coffee break—Room: Exhibition Area
11:30-12:00	Session 3. The clinical history is crucial! Pokieser, Peter-Room: Julia
	Moderator: Ekberg, Olle
12:00-13:00	Session 4. Radiology for the dysphagologist. Martin-Harris, Bonnie
	Moderator: Pokieser, Peter
13:00-14:00	Lunch—Room: Exhibition Area
14:00-14:30	Session 5. CT-MR-PET for the dysphagologist. Abdul-Kasim, Kasim-Room: Julia
	Moderator: Hamdy, Shaheen
14:30-15:00	Session 6. Esophagology for the dysphagologist. Shaker, Reza
	Moderator: Ekberg, Olle
15:00-15:30	Session 7. Psychiatric aspects of dysphagia. Bulow, Margareta
	Moderator: Speyer, Renee
15:30-16:00	Coffee—Room: Exhibition Area
16:00-17:00	Session 8. The physical examination. Regan, Julie-Room: Julia
	Moderator: Walshe, Margaret
17:00-18:00	Session 9. Therapy: more than manoeuvres. Robbins, JoAnne
	Moderator: E Wagner-Sonntag

SCIENTIFIC PROGRAMME	Congress FRIDAY SEPTEMBER 13
08:00-08:30	Session 1. Pediatric dysphagia—Position statements—Room: Julia
	Walshe, Margaret; Woisard, Virginie, Fichaux-Bourin, Pascale
	Moderator: Woisard, Virginie
08:30-10:00	Session 2. Dysphagia after treatment for head & neck cancer
	Moderator: Lawson, Georges
	+ 2 Scientific Presentations
	1. Physiologic swallowing impairment and adaptation following oropharyngeal cancer treatment. Martin-Harris, Bonnie
	2. Dysphagia post therapy: assessment tools and rehabilitation program in daily practice. Lawson, Georges
	3. Management of Dysphagia during chemo-radiotherapy:
	a. Italian recommendations. Schindler, Antonio
	b. Belgian experience in CHU Mont Godinne. Lawson, Georges
OP01.	SWALLOWING THERAPY DOES NOT ACCELERATE RETURN TO NORMAL FOOD INTAKE AFTER RADIOTHERAPY
	Kalf, Hanneke; van den Berg, Manon; Merkx, Thijs; Wanten, Geert; Kaanders, Hans; Netherlands
OP02.	LATE DYSPHAGIA AFTER IMRT FOR HEAD AND NECK CANCER AND CORRELATION WITH DOSE-VOLUME PARAMETERS
	Mortensen, Hanna; Jensen, Kenneth; Aksglade, Karin; Behrens, Marie;
	Denmark
10:00-10:30	Coffee and Poster Viewing Group A, PP01-PP21, see abstract book-Room: Exhibition Area and Hamlet
10:30-10:40	Welcome. Ekberg, Olle; Clave, Pere
10:40-12:00	Session 3. Dysphagia after treatment for H&N cancer continued
	Moderator: A Schindler
	1. Impairments and treatment of OD after surgery
	a. After open neck surgery. Martin-Harris, Bonnie
	b. After supracricoid and supratracheal laryngectomy. Schindler, Antonio
	c. After transoral supraglottic laryngectomy. Lawson, Georges
	d. After transoral oropharyngectomy. Lawson, Georges
	Position statements on clinical guidelines for HNC
12:00-13:30	Lunch—Room: Exhibition Area
12:30-13:00	FRESENIUS-KABI Satellite Symposium/interactive workshop—Room: Romeo
	"Linking Protocols: from diagnosis to nutrition." Hanson, Ben
13:30-14:30	Session 4. Feeding and respiration—Room: Julia
	Moderator: Ekberg, Olle
	1. Respiratory-swallow phase training: efficacy and effects. Martin-Harris, Bonnie
	2. Neurophysiologic regulation of breathing and swallowing. Cedborg, Anne H.
	3. Pulmonary consequences of aspiration. Verin, Eric
14:30-15:30	Session 5. Presbyphagia, normal and abnormal swallowing in the elderly—Room: Julia
	Moderator: Smithard. David
	1. The Aging Swallow-Presbyphagia: A "set-up" for dysphagia and is it preventable? Robbins, JoAnne
	2. Effect of aging on the airway protective mechanisms against aspiration. Shaker. Reza
15:30-16:00	Coffee and Poster Viewing Group B PP22–PP42. see abstract book —Room: Exhibition Area and Hamlet
16:00-17:30	Parallel Session 06/1 Scientific Presentations: Diagnosis—Room: Julia
	Moderator: Spever, Renee
OP03.	FLUID MECHANICS OF OROPHARYNGEAL SWALLOWING AND DYSPHAGIA
	Engmann, Jan: Burbidge, Adam: Ramaioli, Marco: Beniamin, Le Reverend
	Switzerland

SCIENTIFIC	Congress
PROGRAMME	FRIDAY SEPTEMBER 13

OP04.	COMPARISON STUDY OF DIAPHRAGM MOVEMENT DURING VOLUNTARY COUGH IN STROKE PATIENTS WITH DYSPHAGIA
	<u>lm, Sun;</u> Park, Geun Young; Lee, Eu Jin; Kim, Young Moon Republic of Korea
OP05.	TRANSNASAL ENDOSCOPY—AN IRISH PILOT STUDY
	Lawson, Susan; Hall, Barry; Holleran, Grainne; Murphy, Maeve; McNamara, Deirdre Ireland
OP06.	QUANTITATIVE ASSESSMENT OF PHARYNGO-ESOPHAGEAL FUNCTION IN PATIENTS WITH DYSPHAGIA USING AUTOMATED IMPEDANCE MANOMETRY (AIM) ANALYSIS
	Rommel, Nathalie; Selleslagh, Margot; Liesenborghs, Claudia; Scheerens, Charlotte; Cock, Charles; Fraser, Rob; Kritas, Stamatiki; Vanbeckevoort, Dirk; Tack, Jan; Dejaeger, Eddy; Omari, Taher
	Belgium
OP07.	Withdrawn
OP08.	THE NUMBER OF SWALLOW TRIALS IN FEES PROTOCOLS TO ESTIMATE ASPIRATION RISK IN PATIENTS WITH OROPHARYNGEALDYSPHAGIA <u>Baijens</u> , Laura; Pilz, Walmari; Roodenburg, Nel; Speyer, Renee Netherlands
OP09.	DEVELOPING A SCALE TO IDENTIFY CHOKING RISK FOR ADULTS WITH INTELLECTUAL DISABILITY: INITIAL PILOT DATA
	Leavy, Deirdre; Barragry, Laura; O' Connor, Stephanie; Walshe, Margaret Ireland
OP10.	PREDICTORS FOR OROPHARYNGEAL DYSPHAGIA AND ASPIRATION IN PARKINSON'S DISEASE
	Simons, Janine A; Katalinic, Alexander; Ceballos-Baumann, Andres, O; Fietzek, Urban, M Germany
Parallel Session	n 06/2 Scientific Presentations: Neurological Diseases—Room: Romeo
Moderator: Olse	son, Rolf
OP11.	PREVALENCE AND RISK FACTORS OF OROPHARYNGEAL DYSPHAGIA IN STROKE PATIENTS
	Vilardell, Natalia; Rofes, Laia; Muriana, Desiree; Alvarez-Berdugo, Daniel; Palomeras, Ernest; Clave, Pere Spain
OP12.	ESOPHAGEAL SWALLOWING DISORDERS IN PATIENTS WITH DIFFERENT PARKINSONIAN SYNDROMES AS DETECTED BY HIGH RESOLUTION MANOMETRY
	Suttrup, Inga; Suntrup, Sonja; Marie-Luise, Siemer; Bauer, Jutta; Hamacher, Christina; Oelenberg, Stephan; Domagk, Dirk; Dziewas, Rainer; Warnecke, Tobias Germany
OP13.	THE IMPACT OF LESION LOCATION ON DYSPHAGIA PATTERN AND PNEUMONIA IN ACUTE STROKE
	Suntrup, Sonja; Kemmling, Andre; Hamacher, Christina; Suttrup, Inga; Warnecke, Tobias; Dziewas, Rainer Germany
OP14.	VALIDATION AND INITIAL EXPERIENCE WITH THE DUTCH VERSION OF THE MCGILL INGESTIVE SKILLS ASSESSMENT (MISA-D) REGARDING HEALTH OUTCOMES IN AN ELDERLY POPULATION WITH NEUROGENIC DYSPHAGIA.
	Vanderwegen, Jan; Kostermans, Tineke; Van Nuffelen, Gwen; De Bodt, Marc
	Belgium
OP15.	CLINICAL OROPHARYNGEAL SWALLOWING EVALUATION OF SUBACUTE SCLEROSING PANENCEPHALITIS IN RURAL AREA
	Serel, Selen; Demvr, Numan; Karaduman, Ayse; Anlar, Banu
	Turkey
OP16.	EFFICACY OF DYSPHAGIA SCREENING IN PREDICTING ASPIRATION PNEUMONIA IN POSTSTROKE PATIENTS Schindler, Antonio; Scarponi, Letizia; Mozznaica, Francesco; Franza, Paola; Rosa, Silvia; Gambaro, Paola Italy

SCIENTIFIC PROGRAMME	Congress FRIDAY SEPTEMBER 13
OP17.	LONG-TERM IMPROVEMENT IN DYSPHAGIA SEVERITY FOLLOWING PHARYNGEAL ELECTRICAL STIMULATION (PES) AFTER ACUTE STROKE: A PHASE II DOUBLE-BLINDED RANDOMISED CONTROLLED TRIAL
	Vasant, Dipesh H; Michou, Emilia; Tyrrell, Philippa; Vail, Andy; Mistry Satish; Jayasekeran, Vanoo; Anwar, Sajjad; Gamble, Ed; Hamdy, Shaheen
	United Kingdom
OP18.	THE PSYCHOLOGICAL AND SOCIAL IMPACT OF OROPHARYNGEAL DYSPHAGIA ON PEOPLE WITH MULTIPLE SCLEROSIS
	Walshe, Margaret; O' Connor, Ciara; Constantinou, Astero
	Ireland
Parallel Session	06/3 Scientific Presentations: Miscellaneous-Room: Hamlet Moderator: Clave, Pere; Arenaz-Bua, Beatriz
OP19.	OROPHARYNGEAL COLONIZATION BY RESPIRATORY PATHOGENS IS PREVALENT IN PATIENTS WITH COMMUNITY ACQUIRED PNEUMONIA
	<u>Ortega, Omar</u> ; Sakwinska, Olga; Combremont, Severine; Jankovic, Ivana; Clave, Pere Switzerland
OP20.	SWALLOWING DISORDERS IN THE ELDERLY: WHAT WE NEED TO KNOW
	Nogueira, Dalia; Lopes, Ines; Reis, Elizabeth Portugal
OP21.	THE EFFECT OF STRESSFUL AND RELAXING VISUAL STIMULI ON UPPER ESOPHAGEAL SPHINCTER PRESSURE
	Kuhn, Maggie; Domer, Amanda; Robinson, Aaron; Belafsky, Peter
	United States
OP22.	PHARYNGEAL PRESSURE FLOW METRICS ARE INDEPENDENTLY INFLUENCED BY AGE AND PRESENCE OF DYSPHAGIA
	Liesenborghs, Claudia; Omari, Taher; Scheerens, Charlotte; Selleslagh, Margot; Cock, Charles; Fraser, Robert; Kritas, Stamatiki; Van Oudenhove, Lukas; Goeleven, Ann; Dejaeger, Eddy; Rommel, Nathalie
	Belgium
OP23.	PERSPECTIVES ON THE SPEECH AND LANGUAGE THERAPIST'S ROLE IN PALLIATIVE CARE: RESULTS OF AN INTERNATIONAL SURVEY
	O'Reilly, Aoife; Walshe, Margaret
	Ireland
OP24.	A LONGITUDINAL STUDY OF RISK OF PNEUMONIA DEATH IN INDEPENDENTLY LIVING OLDER PEOPLE WITH SYMPTOMS OF DYSPHAGIA IDENTIFIED ON QUESTIONNAIRE SURVEY
	Nimmons, Danielle; Michou, Emilia; Jones, Maureen; Pendleton, Neil; Horan, Mike; Hamdy, Shaheen
	United Kingdom
OP25.	ATTITUDES, KNOWLEDGE, AND PRACTICES IN THE PROVISION OF ORAL CARE: A SURVEY
	Hill, Fiona; Ryan-Withero, Phillippa; Connors, Siobhan
	Ireland
OP26.	'YES, WE CAN EAT' IRELAND'S FIRST FEEDING TUBE WEANING PROGRAMME FOR CHILDREN WITH COMPLEX CARDIAC AND MEDICAL CONDITIONS.
	Butler, Celia; Greene, Zelda
	Ireland
17:30-18:00	ESSD General Assembly

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08:00-09:00	Session 7. International perspectives on dysphagia curriculums-Room: Julia
	Moderator: Robbins, JoAnne
	 Dysphagia curriculum for graduate studies: knowledge and skills, case-based learning, and clinical practicum. Martin-Harris, Bonnie
	2. An overview of the different organizations in charge of swallowing disorders training in Europe. Woisard, Virginie
09:00-10:00	Session 8. ESSD activities and initiatives
	Moderator: Clave, Pere
	1. Overview. Clave, Pere
	2. Dysphagia Working Group ESSD/EUGMS. Smithard, David
	3. Guideline and methodology to explore dysphagia amongst neurological patients: ESSD/ESPEN. Speyer, Renee
	4. Agora educational platform for ESSD. Lewis, Jane
	5. Rheological basis to develop a global classification
	i. In vitro. Hanson, Ben
	ii. In vivo. Clave, Pere
	iii. A COST approach to research on rheology. Clave, Pere; Lewis, Jane
10:00-10:30	Coffee and Poster Viewing Group C PP43-PP63, see abstract book-Room: Exhibition Area and Hamlet
10:30-12:00	Session 9. UES—friend or foe?—Room: Julia
	Moderator: Lawson, Georges
	UES, a friend: how can we manage its dysfunction medically. Shaker, Reza;
	UES from the surgeon's perspective. Feussner, Hubertus
12:00-13:30	Lunch—Room: Exhibition Area
12:30-13:30	WORKSHOP—NUTRICIA—Room: Ofelia The proof is in the pudding Chef Neil
13:30-14:30	Session 10. GER, globus, phonastenia and dysphagia-Room: Julia
	Moderator: Martin-Harris, Bonnie
	1. Voice and dysphagia. Farneti, Daniele
	2. GERD-Induced esophageal dysphagia. Shaker, Reza
14:30-15:30	Session 11. Oral/enteral feeding
	Moderator: Ekberg, Olle
	1. The importance of enteral nutrition. Stene, Christina
	2. Salivary functions and stimuli for secretion. Ekstrom, Jorgen
	3. High-intensity training in neurological diseases: implications for dysphagia. Lexell, Jan
15:30-16:00	Coffee and Poster Viewing Group D PP64-PP83, see abstract book-Room: Exhibition Area and Hamlet
16:00-17:30	Parallel Session 12/1 Scientific Presentations: Diagnosis 2-Room: Julia
	Moderators: Pokieser, Peter; Verin, Eric
OP27.	VALIDATION AND PSYCHOMETRIC ANALYSIS OF THE DUTCH VERSION OF THE SWAL-QOL (DSWAL-QOL).
	Vanderweaen, Jan; Van Nuffelen, Gwen; De Bodt, Marc
	Belgium
OP28.	A HINT TOWARDS OBJECTIVE CORTICAL CORRELATES OF FUNCTIONAL DYSPHAGIA
	Suntrup, Sonja; Teismann, Inaa; Warnecke, Tobias; Suttrup, jnaa; Hamacher, Christina; Pantev, Christo; Dziewas, Rainer
	Germany
OP29.	USEFULNESS OF CITRIC COUGH TEST FOR SCREENING OF SILENT ASPIRATION IN SUBACUTE STROKE PATIENTS: A PROSPECTIVE STUDY.
	Guillen-Sola, Anna; Chiarella, Sandra; Martinez-Orfila, Joan; Alvarado Panesso, Martha Liaia; Bas Costas, Nuria; Fiaueres Cuaat, Antoni; Marco, Ester
	Spain

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OP30.	ARE SCREENING PROCEDURES USEFUL IN POSTACUTE DYSPHAGIC PATIENTS?
	Ledl, Christian; Heller, Christina; Hinterberaer, Kathrin; Houamed, Miriam; Klabuschnia, Melanie
	Germany
OP31.	PREVALENCE OF OROPHARYNGEAL DYSPHAGIA IN THE NETHERLANDS: A TELEPHONE SURVEY
	Kertscher, Berit; Speyer, Renee; Heijnen, Bas
	Netherlands
OP32.	VALIDATION OF THE ITALIAN SWAL-QOL
	Schindler, Antonio; Ginocchio, Daniela; Vedrodyova, Miriam; Farneti, Daniele; Chiarello, Giulia; Simonelli, Marilia; Calcaano, Paola; Accornero, Anna
	Italy
OP33.	CLINICAL VARIABLES INFLUENCING SCREENING TIME DURING VIDEOFLUOROSCOPY
	Hill, Fiona; Keane, Julie; Flynn, Eadaoin; Gallaaher, Ruth; Farrell, Eric; Murphy Maeve
	Ireland
OP34.	THE INFLUENCE OF AGE, SEX AND VISUAL FEEDBACK ON MAXIMUM LIP STRENGTH AND ENDURANCE IN HEALTHY BELGIAN ADULTS.
	Vanderweaen, Jan; Guns, Cindy; Van Nuffelen, Gwen; Elen, Rik; De Bodt, Marc
	Belgium
Parallel Sessio	n 12/2 Scientific Presentations: Head and neck cancer-Room: Romeo
Moderators: La	wson, Georges; Fichaux-Bourin, Pascale
OP35.	CORRELATION OF HEALTH-RELATED QUALITY OF LIFE WITH SWALLOWING PERFORMANCE IN PATIENTS WITH LOCALLY ADVANCED HEAD-NECK CANCER TREATED WITH CHEMORADIATION
	Xinou, Ekaterini; Kyniaou, Maria; Chrysoaonidis, joannis; Printza, Athanasia; Kelekis, Anastasios; Iliopoulou, Chryssoula; Andreadis, Charalampos; Manaoudi, Doxa; Panaaiotopoulou-Mpoukla, Dimitra
	Greece
OP36.	PREVALENCE OF DYSPHAGIA AS A LONG TERM COMPLICATION OF HEAD AND NECK RADIOTHERAPY
	Szczesniak, Michal; Maclean, Julia; Zhana, Teng; Graham, Peter; Cook, Ian
	Australia
OP37.	TWO-YEAR RESULTS OF A PROSPECTIVE PREVENTIVE SWALLOWING REHABILITATION TRIAL IN PATIENTS TREATED WITH CHEMORADIATION FOR ADVANCED HEAD AND NECK CANCER
	van der Molen, Lisette; van Rossum, Maya A; Rasch, Coen RN; Smeele, Ludi E; Hilaers, Frans JM
	Netherlands
OP38.	PROPHYLACTIC SWALLOWING EXERCISES ON DYSPHAGIA AFTER RADIOTHERAPY FOR HEAD AND NECK CANCER—A PROSPECTIVE RANDOMIZED PHASE II TRIAL
	Mortensen, Hanna R; Jensen, Kenneth; Aksalaede, Karin; Lambertsen, Karin; Behrens, Marie; Eriksen, Eva; Grau, Cai
	Denmark
OP39.	DYSPHAGIA AND FEEDING MANAGEMENT AFTER SUPRACRICOID LARYNGECTOMY
	Pizzorni, Nicole; Scarponi, Letizia; Ginocchio, Daniela; Schindler, Antonio
	Italy
OP40.	USE OF THE MODIFIED BARIUM IMPAIRMENT PROFILE (MBSIMP) SCORING IN CLINICAL PRACTICE: 1-YEAR EXPERIENCE IN ANONCOLOGIC HOSPITAL IN GREECE
	Xinou, Ekaterini; Kyniaou, Maria; Chrysoaonidis, Ioannis; Printza, Athanasia; Iliopoulou, Chryssoula; Andreadis, Charalampos; Mangoudi, Doxa; Pazaitou-Panayiotou, Kalliopi; Panaaiotopoulou-Mpoukla, Dimitra
	Greece
OP41.	INTER-RATER RELIABILITY OF AUTOMATED IMPEDANCE-MANOMETRY (AIM) ANALYSIS AND FLUOROSCOPY IN PATIENTS WITH DYSPHAGIA FOLLOWING HEAD AND NECK RADIOTHERAPY
	Szczesniak, Michal; Omari, Taher; Maclean, Julia; Liu, Rona; Cook, Ian
	Australia

SCIENTIFIC Congress PROGRAMME SATURADAY SEPTEMBER 14

Parallel Session 12/3 Scientific Presentations: Treatment-Room: Hamlet

Moderators: Wagner-Sonntag, Edith; Denk-Linnert, Doris-Maria EFFORTFUL SWALLOWING DOES NOT AFFECT STRENGTH OF PHARYNGEAL CONTRACTION, RATHER ITS OP42. TIMING WITH BOLUS FLOW: AN AUTOMATED IMPEDANCE MANOMETRY (AIM) ANALYSIS Scheerens, Charlotte; Vermeyen, Benedicte; Van Oudenhove, Lukas; Selleslagh, Margot; Dejaeger, Eddy; Goeleven, Ann; Oustamanolakis, Pantelis; Tack, Jan; Omari, Taher; Rommel, Nathalie Belgium OP43. LOCALIZATION AND EXPRESSION OF TRPV RECEPTORS IN SENSORY AREAS OF THE HUMAN OROPHARYNX Alvarez-Berduao, Daniel; Casamitjana, J Francesc; Enrique, Ana; Rofes, Laia; Clave, Pere Spain OP44. CRICOPHARYNGEAL DYSFUNCTION: BALLOON DILATATION AND LASER MYOTOMY, A PILOT STUDY Arenaz Bua, Beatriz; Olsson, Rolf; Bulow, Margareta; Ekberg, Olle; Westin, Ulla Sweden OP45. PREPARATION OF THICKENED DRINKS: CAN ACCURACY BE IMPROVED BY USING PRE-THICKENED PRODUCTS AS A VISUAL REFERENCE? Hanson, Ben; Cohen, Stephen; Smith, Christina United Kingdom OP46. REHABILITATION FOR UPPER OESOPHAGEAL DYSFUNCTION FOR ADULTS WITH NEUROLOGICAL DYSPHAGIA: AN EVIDENCE BASED SYSTEMATIC REVIEW Chiana, Mindy; Walshe, Margaret Ireland OP47. DOES BOLUS VOLUME AND CONSISTENCY INFLUENCE SWALLOW PHYSIOLOGY DURING LEFT AND RIGHT HEAD ROTATION? AN AUTOMATED IMPEDANCE MANOMETRY (AIM) ANALYSIS Scheerens, Charlotte; Vermeyen, Benedicte; Van Oudenhove, Lukas; Selleslaah, Margot; Dejaeger, Eddy; Goeleven, Ann; Oustamanolakis, Pantelis; Tack, Jan; Omari, Taher; Rommel, Nathalie Belgium

17:30–18:00 Closing Ceremony—Room: Julia

Abstract Book

Oral Presentations OP.02–OP.47 FRIDAY SEPTEMBER 13

OP.02

Late Dysphagia After IMRT for Head and Neck Cancer and Correlation with Dose-Volume Parameters

Mortensen, Hanna R.*¹; Jensen, Kenneth¹; Aksglæde, Karin²; Behrens, Marie³; Grau, Cai¹

¹Department of Oncology, Aarhus University Hospital, Denmark; ²Motility Laboratory, Department of Gastroenterology L and Department of Radiology, Aarhus University Hospital, Denmark; ³Department of Occupational Therapy and Physiotherapy, Aarhus University Hospital, Denmark

Introduction: Among head and neck cancer survivors many experience diminished quality of life owing to dysphagia following treatment. The aim of this study was to investigate frequency, intensity and dose-volume dependency for late dysphagia in head and neck cancer patients treated with curative radiotherapy (IMRT).

Materials and Methods: Candidates for the study were patients treated with primary IMRT from 2006-2010; a total of 259 patients (88 %) accepted the invitation to participate by answering the EORTC OLO-C30 and H&N35 questionnaires. A total of 65 patients were further examined with i.a. Modified Barium Swallow (MBS) and saliva samples. Data on patient, tumor and treatment characteristics were obtained from the DAHANCA database including observed-rated dysphagia and DVHs of relevant organs at risk (OAR) were analyzed. Results: Median follow-up after treatment was 3.3 years (range 1.0-5.3), median age 63 years, 85 % men, larynx 37 %, pharynx 52 %, oral cavity 11 %; 57 % stage IV disease; weekly cisplatin 41 %, Zalutumumab 16 %. The QoL data showed low degree of dysphagia with mean scores below 15. The most frequent objective swallowing dysfunction was retention on MBS, occurring in 41 of the 65 patients (63 %). Penetration and aspiration was less common, 31 and 6 %, respectively. In general, complications observed on MBS and observer assessed late dysphagia correlated with the dose to superior and middle PCM, whereas quality of life endpoints correlated with dose-volume parameters in the larynx and supraglottic larynx.

Conclusion: In this cohort a high rate of retention was found on MBS whereas aspiration was rare. Objective and subjective swallowing dysfunction cannot be expected to be described using DVH parameters of the same OAR.

OP.03

Fluid Mechanics of Oropharyngeal Swallowing and Dysphagia

Engmann, Jan*¹; Burbidge, Adam²; Ramaioli, Marco²; Benjamin, Le Révérend²

¹Nestlé Research Center, Vers-chez-les-Blanc, Switzerland; ²Nestlé Research Center, Switzerland

Introduction: We apply mathematical/physical techniques for the description of fluid flow to flows arising in liquid and semisolid bolus swallows and compare predictions with experimental data.

Methods: Physically based mathematical descriptions of swallowing flows are used to draw conclusions about the effects of various material/physiological parameters, e.g. viscosity, density, muscle elasticity, throat geometry. Model experiments have been used to verify some of these conclusions.

Results and Discussion: The (healthy) swallowing process appears to involve two kinds of flow processes: (i) a fast flow due to rapid tongue propulsion, for which the viscosity of the fluid is relatively unimportant; and (ii) a squeezing of the pharynx that strips out the remaining fluid boundary layer after the majority of the high speed bolus has passed, for which the fluid viscosity is extremely important. One can describe the flow process as a balance between muscular (elastic) squeezing and fluid resistance to flow (due to viscosity). This balance defines a timescale for the fluid passage, the residence time being proportional to the ratio of viscosity/elasticity and one can predict the quantitative changes due to a change in either quantity. Effects of geometry are more subtle, but in general, smaller flow paths lead to increased residence times. This improved understanding should result in better guidelines for rheological modification to specific patterns of physiological impairment in swallowing. Model verification is currently severely restricted by a lack of high resolution, dynamical, in-vivo imaging techniques, which we are beginning to address.

OP.04

Comparison Study of Diaphragm Movement During Voluntary Cough in Stroke Patients with Dysphagia

Im, Sun*1; Park, Geun Young²; Lee, Eu Jin²; Kim, Young Moon²

¹The Catholic University of Korea, College of Medicine, Bucheon St. Mary's Hospital, Republic of Korea; ²Catholic University of Korea, College of Medicine, Republic of Korea

Introduction: This study was carried out to determine if stroke patients with dysphagia (group A) have reduced diaphragm excursion movement compared to stroke patients without dysphagia (group B) and to normal healthy controls (group C).

Materials and Methods: Diaphragm movement was assessed using M-mode ultrasonography. Diaphragm movements were examined during quiet breathing, deep inspiration and voluntary cough. Maximal inspiratory, expiratory pressures (cmH₂O) along with peak cough flow (liter/min) during voluntary cough were measured.

Results and Discussion: A total of 74 patients (group A = 23, group B = 24, group C = 27) were recruited. The mean \pm SD (cm) diaphragm movement of the hemiplegic side for group A/B/C during rest, deep inspiration and voluntary cough were 1.5 \pm 0.4/1.8 \pm 0.5/ 2.1 ± 0.4 cm (P < .001); $2.4 \pm 0.7/3.3 \pm 1.1/4.5 \pm 1.0$ cm (P < .001), $1.7 \pm 0.5/2.9 \pm 0.5/3.6 \pm 0.8$ cm (P < .001) respectively, and the differences were statistically significant. Differences were also observed in the maximal inspiratory (P < .001), expiratory pressures (P < .001) and peak cough flow (P = .027) among the three groups. During deep inspiration, there was also significant reduction in the nonhemidiaphragmatic excursion in group A (P = .035). Stroke patients with dysphagia have significantly reduced diaphragm movement and weak inspiratory, expiratory and cough forces, consistent with respiratory muscle weakness compared to normal healthy controls and to stroke patients without dysphagia. Compromised respiratory muscle function along with reduced diaphragm movement and impaired cough forces, may put stroke patients with dysphagia at increased risk of aspiration pneumonia.

Transnasal Endoscopy—An Irish Pilot Study

Lawson, Susan^{*1}; Lawson, Susan²; Hall, Barry³; Holleran, Grainne³; Murphy, Maeve⁴; McNamara, Deirdre⁵

¹Tallaght Hospital, Dublin 24, Ireland; ²Department of Speech and Language, Tallaght Hospital, Ireland; ³Department of Clinical Medicine, Tallaght Hospital, Ireland; ⁴Department of Speech & Language Therapy, Tallaght Hospital, Ireland; ⁵Department of Clinical Medicine, Tallaght Hospital, Ireland

Introduction: Unsedated trans-nasal endoscopy (TNE) offers the possibility of accurate, safe and efficient endoscopic assessment of the pharynx, oesophagus and stomach with less cost and fewer risks compared with sedated upper endoscopy (SE).

Our aim: To compare the feasibility, safety and tolerance of TNE as an alternative to SE in an Irish context.

Methods: Patients attending a joint SLT Gastroenterology dysphagia clinic scheduled for SE were prospectively recruited and invited to undergo TNE. Patients opting for unsedated SE acted as controls. Indication, findings, duration and complications were recorded. A visual analogue scale was used to assess patient tolerance. All statistics performed using SPSS19. Results were expressed as a mean compared with student T-test (P > 0.05 = significant). Logistic regression analysis was performed for variables associated with endoscopy.

Results: 19 (TNE = 10 SE = 9) patients were enrolled. Majority of patients were male (n = 10), mean age 56 (range 35–74). Intubation achieved with all patients with no reported complications. No difference in pain on intubation or during the procedure between the two groups was evident. Choking on intubation was lower in TNE (p = 3.2 [1.4-4.9, 95 % CI] group compared to SE (P = 5.4 [2.9-7.8, 95 % CI] group. This was statistically significant. There was a statistical difference in gagging experienced on intubation, with gagging lower in TNE group. TNE (P = 2.4 [0.9-3.8, 95 % CI] and SE (P = 5.1 [2.2-7.9, 95 % CI]. Statistically significant differences were evident in gagging during the procedure, TNE (P = 1.8 [1-2.9, 95 % CI]) being better tolerated than SE (P = 4.1 [1.8-6.5, 95 % CI].

Discussion: This small study has shown that TNE may be a valuable alternative to SE in diagnostic upper endoscopy, with greater patient tolerance leading to increased accuracy of assessment.

OP.06

Quantitative Assessment of Pharyngo-Esophageal Function in Patients with Dysphagia Using Automated Impedance Manometry (AIM) Analysis

Rommel, Nathalie^{*1}; Selleslagh, Margot²; Liesenborghs, Claudia³; Scheerens, Charlotte³; Cock, Charles⁴; Fraser, Rob⁴; Kritas, Stamatiki⁵; Vanbeckevoort, Dirk⁶; Tack, Jan⁷; Dejaeger, Eddy⁸; Omari, Taher⁹

¹KU Leuven, Neurosciences, ExpORL, Herestraat 49, Belgium; ²KU Leuven, Neurosciences, ExpORL, Belgium; ³KU Leuven, Neurosciences, ExpORL-TARGID, Belgium; ⁴Repatriation General Hospital, Australia; ⁵Women's and Children's Health Service, Australia; ⁶University Hospital Leuven, Radiology, Belgium; ⁷KU Leuven, TARGID, Belgium; ⁸University Hospital Leuven, Belgium; ⁹School of Paediatrics and Reproductive Health, University of Adelaide, Australia

Introduction: Automated Impedance Manometry (AIM) analysis defines swallow metrics indicative of bolus timing and presence,

contractile vigour and luminal diameter. The Swallow Risk Index (SRI) and integrated nadir impedance to impedance ratio (iZn/Z) are global indices correlating with aspiration risk and post-swallow residue respectively (Omari et al., Gastroenterology 2011; Omari et al., Neurogastro. Mot. 2012). This study compared AIM metrics, the SRI and iZn/Z ratio for controls and dysphagic patients.

Materials and Methods: 87 asymptomatic controls 20–91 years (39 M, mean 59 years) and 201 dysphagic patients 17–91 years (117 male, mean 67 years) were investigated. Swallowing of 5–10 ml liquid boluses was recorded by solid state manometry-impedance catheter (OD 3.2 mm, 36 pressure at 1 cm, 12 impedance at 2 cm). AIMplot software was used to derive AIM metrics, SRI and iZn/Z indices. Results: 140 patients had abnormal swallow function (SRI > 15). 123 patients had significant post-swallow residue (iZn/Z > 500). The SRI and iZn/Z ratio were higher in relation to dysphagia (Table). The latency from bolus flow to pharyngeal contraction was shorter and pharyngeal bolus dwell time was longer in patients with dysphagia (Kruskal–Wallis, p < 0.001, p < 0.05 for all pairwise comparisons). UES relaxation pressures were not significantly different in relation to dysphagia.

Discussion: Pharyngeal HRIM with AIM analysis can detect increased swallow dysfunction and post-swallow residue in dysphagic patients.

	Patien	ts	Contro	ols	P-
	N = 2	201	N = 8	37	value
PeakP	125	[80; 178]	131	[104; 193]	0.077
PNadlmp	30	[19; 51]	10	[4; 19]	< 0.001
TNadlmp_PeakP	0.198	[0.111; 0.278]	0.432	[0.365; 0.489]	< 0.001
Flow Interval	1.209	[0.679; 1.839]	0.516	[0.329; 0.914]	< 0.001
SRI	29	[11:53]	3	[1; 7]	< 0.001
UES Ri	0.807	[0.616; 1.087]	0.660	[0.477; 0.859]	< 0.001
UES Nad P	2	[-3; 9]	3	[0; 9]	0.231
UES IBP	15	[8; 25]	15	[8; 26]	0.820
UES Resistance	18	[9; 31]	24	[11; 46]	0.132
UES Nadlmp	470	[287; 646]	196	[165; 264]	< 0.001
UES PNadlmp	10	[2; 23]	6	[2; 11]	0.003
IntZn/Z	585	[377; 805]	130	[65; 213]	< 0.001
UES PostRelaxationP	392	[295; 494]	163	[143; 221]	< 0.001

OP.08

The Number of Swallow Trials in Fees Protocols to Estimate Aspiration Risk in Patients with Oropharyngeal Dysphagia

Baijens, Laura^{*1}; Speyer, Renee²; Pilz, Walmari³; Roodenburg, Nel³; Speyer, Renée⁴

¹Maastricht University Medical Center, P. Debyelaan 25, The Netherlands; ²School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Australia; ³Maastricht University Medical Center, The Netherlands; ⁴Department of Otorhinolaryngology and Head and Neck Surgery, Leiden University Medical Center, The Netherlands

Introduction: A reliable and valid assessment tool to detect patients at risk for aspiration is of great importance. In the literature the assessment protocols to identify aspiration during FEES frequently use a restricted number of swallow trials per patient.

Materials and Methods: The present study estimated the probability of aspiration as function of the number of swallow trials in dysphagic patients using FEES. Eighty-four patients were included. Two different patient populations were distinguished: one group consisted of patients having oropharyngeal dysphagia due to head and neck cancer and possible oncological treatment effects on swallowing (N = 34) whereas the second group contained patients having oropharyngeal dysphagia as a result of a neurological disease (N = 50). All patients underwent a standardized FEES examination using ten swallows of thin liquid followed by ten swallows of thick liquid boluses of 10 cc each. FEES recordings were rated for aspiration by an expert panel blinded to patients' identity and clinical history. Descriptive statistics, Kaplan–Meier survival analysis technique, and Log Rank/Mantel– Cox tests were used.

Results: In both patient populations the aspiration risk is underestimated when using a limited number (three or four) of swallow trials. The oncology and neurology patients differ significantly in the number of swallow trials required to determine aspiration for thin liquid consistency (median values 2 and 7 respectively, p = 0.006). **Conclusion:** Present data suggest that FEES protocols using a limited number of swallow trials can underestimate the aspiration risk in both oncological and neurological patients suffering from oropharyngeal dysphagia, especially when using thin liquid viscosities.

OP.09

Developing a Scale to Identify Choking Risk for Adults with Intellectual Disability: Initial Pilot Data

Leavy, Deirdre $^{\ast 1};$ Barragry, Laura $^{2};$ O'Connor, Stephanie $^{2};$ Walshe, Margaret $^{\ast 1}$

¹Trinity College, Ireland; ²Cheeverstown House, Ireland

Introduction: Choking is a significant risk for adults with Intellectual Disability (ID). Early identification of high risk clients is important. Speech and language therapists (SLTs), and multi-disciplinary team (MDT) members require a user friendly scale to identify these individuals. This study aims to develop a valid reliable Choking Risk Scale (CRS) for MDT use.

Methods: Scale content and construct validity was developed from the literature and other scales. To develop content, construct, face and ecological validity the 37 item CRS was piloted on 54 people with ID. SLTs initially completed a Likert scale on their perceptions of choking risk on these clients. One month later, a CRS was completed on each client. Content validity was checked by comparing CRS scores with perceptions of risk Likert scores. Qualitative data was obtained on content, face and ecological validity. Inter-rater reliability was also examined.

Results: Data was incomplete on five people with ID and these were excluded from the analysis. Data on 49 people was analysed. A significant correlation was found between CRS scores and Likert scale ratings (p < 0.001) suggesting that perception of choking risk is validated by CRS scores. Feedback was given on content and face validity. Strong inter-rater reliability (p < 0.001) on the CRS was found between raters.

Discussion: The CRS was amended based on these results. It is now ready to develop its psychometric properties further and prepare for publication. Once validated, the CRS should inform clinical practice and improve the overall management of clients with ID.

OP.10

Predictors for Oropharyngeal Dysphagia and Aspiration in Parkinson's Disease

Simons, Janine A.*¹; Katalinic, Alexander²; Ceballos-Baumann, Andres, O.³; Fietzek, Urban, M.³

¹University of Luebeck, Institute of Social Medicine and Epidemiology, Ratzeburger Allee 160, House 50, Germany; ²University of Luebeck, Institute of Social Medicine and Epidemiology, Germany; ³Schoen Klinik Muenchen Schwabing, Center for Parkinson's Disease and Movement Disorders, Germany

Introduction: Dysphagia is a relevant but often unrecognized and underestimated problem in patients with Parkinson's disease (PD). In this paper we investigated swallowing impairments and clinical characteristics to classify predictors for the development of dysphagia and aspiration risk.

Materials and Methods: Data were gathered from 77 PD patients at a German Movement Disorder Center. Patients received neurological examinations as well as clinical and endoscopic swallowing evaluations (FEES) with different consistencies. Patients were assigned to three groups 'not dysphagic-A', 'oropharyngeal dysphagia-B' and 'dysphagia with penetration/aspiration-C' (P/A) along their severity grades of underlying rating-scales. Significance or correlation analyses were performed with the Kruskal–Wallis and Fisher's exact test, or shown with Spearman's rho coefficient.

Results: 21 patients were not dysphagic (mean age 68.8 ± 7.4 years, median mod. Hoehn&Yahr 3), 34 patients showed oropharyngeal dysphagia (70.7 ± 8.4 years H&Y3) and 22 patients had dysphagia with P/A (71.8 ± 9.5 years, H&Y4). Whereas H&Y values ≥ 4 are represented in group-A <10 % only, they were found significantly more often in group-B (38 %) and C (77 %). Significant differences in the mean UPDRSIII values could be outlined between group-A (20.89 ± 12.71) and B (31.50 ± 9.77) with p = 0.02, or C (38.46 ± 14.28) with p = 0.03. Weak correlation existed between dysphagia and rising drooling-score-scale (rs = +0.264, p = 0.020), and no significance regarding the results of disease duration, cognitive assessments, BMI or dysarthria score.

Discussion: Evaluations of swallowing are highly correlated with H&Y-stage and motor performance. According to clinical relevance sensible cut-offs for necessary swallowing diagnostics have to be determined.

OP.11

Prevalence and Risk Factors of Oropharyngeal Dysphagia in Stroke Patients

Vilardell, Natàlia^{*1}; Rofes, Laia²; Muriana, Desiree³; Álvarez-Berdugo, Daniel³; Palomeras, Ernest³; Clavé, Pere²

¹Hospital de Mataró, Ctra Cirera s/n, Spain; ²Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (Ciberehd), Instituto de Salud Carlos III, Spain; ³Hospital de Mataró, Spain **Introduction:** Oropharyngeal dysphagia (OD) is a severe condition in stroke patients that can lead to malnutrition, respiratory infections and death.

Aims: To assess prevalence and risk and prognostic factors associated to post-stroke OD.

Materials and Methods: We conducted a prospective, observational study on stroke patients consecutively admitted to a General Hospital over 10 months. OD was clinically assessed using the volume-viscosity swallow test (V-VST). Rankin Scale (RS), Barthel Index (BI), and National Institute of Health Stroke Scale (NIHSS) were collected during the admission. Clinical and neuroanatomical data were collected according to National Spanish Stroke Register (Renisen).

Results: During the study period, 254 patients were screened 180 fulfilling the inclusion criteria (74.2 \pm 11.5 years, 51.8 % males). Previous to stroke, patients presented good functional status (BI 90.4 \pm 17.1, RS \leq 1 72.8 %). Prevalence of post-stroke OD was 41.7 %. OD was significantly associated to age >70 years, OR 2.5 (1.2–5.1); previous disability RS > 1, OR 2.4 (1.2–4.6); previous stroke, OR 2.5 (1.4–4.8); severity of stroke NIHSS > 7, OR 4.1 (1.2–10.0); total anterior circulation infarction, OR 3.4 (1.2–11.2) and right lateralization, OR 2.6 (1.4–5.1). OD was associated with higher risk of respiratory infections, OR 17.9 (2.3–141.8), prolonged hospitalization and intrahospital mortality, OR 9.04 (1.1–76.8), and poor outcome following discharge including impaired functional status RS > 2, OR 4.4 (2.3–8.2) and increased risk of institutionalization, OR 3.4 (1.8–6.8).

Discussion: Prevalence of post-stroke OD is very high, it is associated to specific clinical neurological and neuroanatomical factors and causes severe health impairment during hospitalization and after discharge.

OP.12

Esophageal Swallowing Disorders in Patients with Different Parkinsonian Syndromes as Detected by High Resolution Manometry

Suttrup, Inga^{*1}; Suntrup, Sonja¹; Marie-Luise, Siemer²; Bauer, Jutta²; Hamacher, Christina¹; Oelenberg, Stephan¹; Domagk, Dirk²; Dziewas, Rainer¹; Warnecke, Tobias¹

¹UKM Münster, Department of Neurology, Germany; ²UKM Münster, Department of Gastroenterology, Germany

Introduction: Dysphagia is a common symptom in patients with Parkinsonian syndromes and may affect all stages of deglutition. Whereas oropharyngeal dysphagia has been well investigated, not much data exist on esophageal swallowing disorders in different Parkinsonian syndromes.

Materials and Methods: We included 42 consecutive patients (25 men; 17 women; mean age 65.8 ± 9.1 years) with different Parkinsonian syndromes, i.e. idiopathic Parkinson's disease (PD; n = 33), multiple system atrophy (MSA; n = 5), progressive supranuclear palsy (PSP; n = 3) and Lewy-body-disease (LBD; n = 1). All subjects were questioned about symptoms of dysphagia and underwent fiberoptic endoscopic evaluation of swallowing (FEES) as well as high resolution manometry (HRM).

Results: HRM detected dysmotility of the esophagus in 85.7 % of subjects (rated as severe in 50 %). Whereas 61.9 % of all patients showed a disturbed function of the upper esophageal sphincter (UES), only 21 % revealed slight impairment of the lower esophageal sphincter (LES). Oropharyngeal dysphagia was detected in 59.5 % of patients by using FEES. In the group of patients that were not complaining about any symptom of dysphagia (n = 15), oropharyngeal

swallowing impairment was found in 60 % and esophageal disturbance in 66.7 % of subjects. Although the disease severity, i.e. Hoehn and Yahr scale, did not differ between the group of PD patients and the group of patients with atypical Parkinsonism (MSA, PSP, LBD), the latter showed a significantly higher prevalence of both oropharyngeal and esophageal swallowing disorders.

Discussion: Dysmotility of the esophagus is the most common finding of swallowing dysfunction in patients with PD and atypical Parkinsonism and even more frequent than oropharyngeal dysphagia.

OP.13

The Impact of Lesion Location on Dysphagia Pattern and Pneumonia in Acute Stroke

Suntrup, Sonja^{*1}; Kemmling, Andre²; Hamacher, Christina¹; Suttrup, Inga¹; Warnecke, Tobias¹; Dziewas, Rainer¹

¹Department of Neurology/University of Muenster, Germany; ²Department of Radiology/University of Hamburg, Germany

Introduction: Although early identification of patients at risk for dysphagia is crucial in acute stroke care, predicting whether a particular patient is likely to have swallowing problems based on the admission brain scan is difficult because a comprehensive model of swallowing control is missing. In this study we systematically evaluated whether stroke location is associated with specific dysfunctional swallow patterns.

Methods: 200 acute stroke patients were investigated with FEES. Stroke lesions were obtained from each patient's neuroimaging and registered to standard brain space. The percentage of lesioned volume of 137 atlas-based brain regions was determined in each case. Significant differences of regional % infarction with region specific odds ratios were afterwards calculated across patients grouped according to the following variables: dysphagia, penetration/aspiration, residuals, pneumonia (present vs. absent, respectively), dysphagia severity (mild vs. severe), swallowing reflex, cough reflex (sufficient vs. insufficient, respectively).

Results: 165 patients were diagnosed with dysphagia, 80 of whom even had severe swallow impairment. For each item there were significant differences of regional % infarction in distinct brain areas between patients who showed that specific swallow dysfunction and those who did not. For example, significant difference of regional % infarction between dysphagia and no-dysphagia cases was found in the right precentral, postcentral and supramarginal gyri, opercular region and related white matter tracts.

Discussion: Our data show that distinct brain lesion locations are associated with characteristic swallowing disturbance patterns. Neuroimaging obtained for stroke ascertainment may function as a tool to risk-stratify patients.

OP.14

Validation and Initial Experience with the Dutch Version of the McGill Ingestive Skills Assessment (MISA-D) Regarding Health Outcomes in an Elderly Population with Neurogenic Dysphagia

Vanderwegen, Jan*¹; Kostermans, Tineke²; Van Nuffelen, Gwen³; De Bodt, Marc⁴

¹UMC Saint-Pierre, Hoogstraat 322, Belgium; ²AZ Sint-Lucas, Belgium; ³Antwerp University Hospital, Belgium; ⁴Ghent University, Belgium

Introduction: The MISA-D is the Dutch version of the McGill Ingestive Skills Assessment (MISA) used to evaluate feeding abilities in elderly patients with neurogenic dysphagia. Research questions were: Can MISA-D be performed in a variety of patients? Corroboration that age is uncorrelated with ingestive skills? Are cognitive decline and MISA-D scores correlated? Is MISA-D predictive for airway-problems or mortality? To further validate MISA-D scores using known-groups. Determine test-retest reliability for intra- and interrater reliability.

Methods: 82 patients (mean age = 79 yo) were included: Parkinson's disease (n = 17), stroke (n = 32), dementia (n = 23) and normal controls (n = 10). Standardized observation was followed-up for up to 180 days with monitoring of pneumonia or death.

Results: Feasibility of MISA-D was excellent in all patients. No significant correlation with age or MMSE was found. Pulmonary infection incidence was too low to allow statistical analysis. Survival analyses revealed higher MISA-D scores to be correlated with decreased risk of death. Comparing controls and patients revealed significant differences in all MISA-D subscores. Intra- and interrater reliability was excellent (ICC > 0.70).

Discussion: The MISA-D allows reliable differentiation between normal and abnormal feeding skills. This study adds to evidence that the relationship between MISA-D scores and risk of mortality is ageindependent. The lack of pneumonia may point to recommending too restrictive diets in patients able to safely consume a more challenging diet. These results provide further evidence for the use of the MISA-D in elderly patients with neurogenic ingestive skill loss, making it helpful in advancing clinical research on ingestion skills and its treatment.

OP.15

Clinical Oropharyngeal Swallowing Evaluation of Subacute Sclerosing Panencephalitis in Rural Area

Serel, Selen*¹; Demýr, Numan²; Karaduman, Ayse²; Anlar, Banu²

¹Hacettepe University, Hacettepe University, Faculty of Health Sciences, Turkey; ²Hacettepe University, Turkey

Introduction: Subacute sclerosing panencephalitis (SSPE) is a progressive neurological disorder of childhood and early adolescence caused by aberrant measles virus infection. The aim of this study was to show the clinical features of their oropharyngeal structures and swallowing.

Materials and Methods: The study included 20 SSPE patients whose mean age were 14.6 ± 4.05 years. The clinical motor function was evaluated with the Gross Motor Function Classification System (GMFCS).And clinical orofacial structure and swallowing evaluation were done.

Results: 45 % of the patients (n:9) were female and 55 % (n:11) were male. The mean diagnosis age was 8.56 ± 4.03 years. 80 % of the patients were in level V and the others were level II according to GMFCS. We found that 35 % of them had open mouth, 25 % had open bite, 60 % had high palate in orofacial structure evaluation. 40 % of them had tongue thrust but the percentage of food spillage from the mouth was 80 %. 90 % had oral hygiene problems. In clinical swallowing evaluation, all of them had liquid intake, 85 % could take puding consistency and only 25 % had solid food intake. This result showed us they have had chewing problem (75 %). 20 % of them had recurrent pneumonia history and coughing, choking during feeding. Their families refused transition to nonoral feeding despite recurrent pneumonia.

Discussion: SSPE is characterized with serious disabilities that affects the children and their families' quality of life negatively. Problems with orofacial structures and hygiene, chewing problems and resume oral intake despite recurrent pneumonia histories draws attention in our study. So these problems should be handled in detail, risks about swallowing problems should be explained and family training should be given.

OP.16

Efficacy of Dysphagia Screening in Predicting Aspiration Pneumonia in Poststroke Patients

Schindler, Antonio*¹; Scarponi, Letizia²; Mozznaica, Francesco²; Franza, Paola³; Rosa, Silvia³; Gambaro, Paola³

¹Department of Biomedical and Clinical Sciences "L. Sacco", University of Milan, Via G. B. Grassi 74, Milan, Italy; ²Department of Biomedical and Clinical Sciences "L. Sacco", University of Milan, Italy; ³Stroke Unit, Sacco Hospital, Italy

Introduction: Post-stroke dysphagia ranges between 29 and 78 % and may lead to aspiration pneumonia. A systematic use of dysphagia screening is highly recommended since it can reduce the incidence of stroke-associated pneumonia (SAP). The aim of this study is to assess the effectiveness of dysphagia screening for prevention of SAP in Italian acute stroke patients admitted to the intensive care unit (ICU). **Materials and Methods:** In the year 2011, 169 acute stroke patients were admitted to the ICU. All patients were evaluated following the SSA protocol (Standardized Swallowing Assessment). Data regarding feeding and incidence of pulmonary complications in the immediate post-stroke period and after at least 6 months follow-up were recorded and analyzed.

Results: All the 169 stroke patients were evaluated by trained nurses, and were divided into two groups: group 1 was composed by 107 patients (63 %) without signs of dysphagia, group 2 was composed by 62 patients (37 %) positive in the SSA examination. Patients in group 2 appeared older, with a mayor stroke gravity than the patients included in group 1. Sixteen subjects (9.5 %) developed pneumonia during hospitalization. Six of them with tube feeding, developed a right or bilateral pneumonia while 10 patients developed a left pneumonia. The patients that developed a right pneumonia were positive to the SSA test. The 5.2 % of the 134 patients 6 months after the hospitalization developed a pneumonia.

Discussion: Dysphagia screening is associated with a low incidence of pneumonia. Enteral nutrition does not reduce to zero the risk of develop SAP.

OP.17

Long-Term Improvement in Dysphagia Severity Following Pharyngeal Electrical Stimulation (PES) After Acute Stroke: A Phase II Double-Blinded Randomised Controlled Trial

Vasant, Dipesh H.*¹; Michou, Emilia¹; Tyrrell, Philippa²; Vail, Andy³; Mistry, Satish¹; Jayasekeran, Vanoo¹; Anwar, Sajjad⁴; Gamble, Ed⁵; Hamdy, Shaheen¹

¹Gastrointestinal Centre, Institute of Inflammation and Repair, University of Manchester, UK; ²Stroke Medicine, UK; ³Medical Statistics, University of Manchester, UK; ⁴Trafford General Hospital, UK; ⁵University Hospital South Manchester, UK **Introduction:** Pharyngeal Electrical Stimulation (PES) is a promising treatment, already known to activate pharyngeal motor pathways and in pilot studies improved swallowing function 2 weeks after acute stroke [1–2], however the longer-term effects on swallowing remain unexplored.

Materials and Methods: 36 hospitalised patients with new-onset dysphagia (22 males, mean age 70 ± 2.1 years), were recruited within 6 weeks of stroke after failing a standardised swallowing-screening test [3]. Patients were randomised to either Active (n = 18) or Sham (n = 18) PES via an intraluminal pharyngeal catheter at 5 Hz, at 75 % maximum-tolerated intensity for 10 min, for 3 days. A validated Dysphagia Severity Rating (DSR) scale (0–12 (normal-severe dysphagia)) [2] was applied by independent, blinded speech therapists at baseline, 2 weeks and 3 months post-intervention. Data were compared using non-parametric tests and intention to treat analysis.

Results: Active but not Sham PES improved DSR at 2 weeks, (Active: baseline median 12 (IQR 12-5), 2 weeks median 4 (IQR 9-2), U = 41, *p = 0.007, Sham: baseline 9 (IQR 11-3), 2 weeks 5 (IQR 10-1), U = 62.5, p = 0.1). At 3 months, compared to baseline there was overall improvement in DSR in both groups (Active: 3 months median 2 (IQR 3-0), U = 9.5, p = 0.000, Sham: 3 months median 1 (IQR 3-0), U = 28, p = 0.001). However, when DSR at 2 weeks and 3 months were compared there was only improvement in the Active PES group (Active: U = 43.5, **p = 0.018, Sham: U = 62, p = 0.09).

Discussion: These data provide further evidence that PES expedites swallowing recovery post-stroke, an effect that is maintained at 3 months after intervention.

References: 1. Fraser, C., et al., Neuron, 2002. 2. Jayasekeran, V., et al., Gastroenterology, 2010. 3. Martino, R., et al., Stroke, 2009 (Fig. 1).



Fig. 1 Change in dysphagia severity post PES

OP.18

The Psychological and Social Impact of Oropharyngeal Dysphagia on People with Multiple Sclerosis

Walshe, Margaret*1; O' Connor, Ciara2; Constantinou, Astero2

¹Trinity College Dublin, 7-9 South Leinster St, Ireland; ²Trinity College Dublin, Ireland

Introduction: The prevalence of dysphagia in multiple sclerosis (MS) is estimated to range from 32 to 55 %. Studies to date have focused on the impairment of dysphagia with limited information on its impact on the person's psychological and social functioning.

Personal accounts of dysphagia suggest that it does have a significant effect on the individual. The aim of this study is to explore the psychological impact of oropharyngeal dysphagia (OD) on a group of people MS. The research questions are: (1) what is the psychosocial impact of OD in this population? (2) Is there a correlation between the severity of OD and the severity of psychosocial impact?

Materials and Methods: Ninety-two people with MS covering a range of severities of MS impairment participated in the study. All were screened for cognitive impairment. The Dysphagia Handicap Index (DHI), MASA, 3 oz water swallow test and videofluoroscopy studies were completed on all individuals.

Results: The results of the DHI suggest that dysphagia does impact on the person with MS limiting their social and psychological functioning. There is no strong correlation between the severity of OD impairment and the impact experienced by these people with MS.

Discussion: The impact of dysphagia on people with MS is discussed. The clinical utility of the DHI with this population is examined. Implications for clinical practice are outlined with directions for further research in this area.

OP.19

Oropharyngeal Colonization by Respiratory Pathogens is Prevalent in Patients with community Acquired Pneumonia

Ortega, Omar*¹; Sakwinska, Olga²; Combremont, Severine²; Jankovic, Ivana²; Clavé, Pere¹

¹Hospital de Mataró, Spain; ²Nestlé Research Center, Switzerland

Introduction: Oropharyngeal dysphagia (OD) is a risk factor for community-acquired pneumonia (CAP). The patterns of upper respiratory/alimentary tract colonization by facultative respiratory pathogens are still unknown. We aimed to describe the colonization patterns of the upper respiratory/alimentary tract in older patients with OD.

Materials and Methods: A case-control study with older (\geq 70 years) people including healthy controls (n = 15), and OD patients with (n = 15) and without (n = 30) CAP was performed. OD and aspiration were confirmed by videofluoroscopy. Colonization by pneumonia pathogens (*Streptococcus pneumoniae, Staphylococcus aureus, Haemophilus influenzae, Pseudomonas aeruginosa, Escherichia coli*) in eight locations of the upper respiratory/alimentary tract was determined by qPCR, and microbiota composition by pyrosequencing.

Results: Impaired safety of swallow was found in 61.5 % OD patients with CAP, 40 % without CAP, and 0 % healthy controls. Up to 87 % of patients with OD and 57 % healthy controls (p = 0.013) were colonized by ≥ 1 pathogens, colonization of the oral cavity being 63 % in CAP patients, 60 % in dysphagic patient without CAP and 36 % in healthy elderly (p < 0.05). In contrast, total bacterial load was similar between all groups of patients. The oral cavity was more colonized by pathogens than the nasopharynx in all patients (55 vs. 20 %; p < 0.001). Pyrosequencing showed clear differences in microbial population structure between oral cavity and nasopharynx. **Conclusions:** Dysphagic patients, and particularly those with CAP, presented high rates of oral colonization by respiratory pathogens and videofluoroscopic signs of impaired safety of swallow. Further studies will confirm the role of these bacteria in the pathophysiology of CAP.

Swallowing Disorders in the Elderly: What We Need to Know

Nogueira, Dalia*1; Lopes, Inês2; Reis, Elizabeth2

¹Escola Superior de Saúde de Alcoitão, Portugal; ²Lisbon University Institute, Portugal

Introduction: Risk factors affecting the ability to swallow are varied considering the mechanical, neurologic, and mental status changes common in the older population. Cognitive disorders, motor function and nutritional status are major risk factors for both swallowing and feeding. Even when the swallow is functional, dementia patients may be unable to sustain nutrition with oral feeding. Assessment of mobility should consider the patient's ability to execute the activities of daily living. A multidisciplinary approach is necessary for an effective and preventive diagnosis with a careful attention to the individual's description of his or hers swallowing difficulties. Each aspect of the clinical evaluation contributes to a more comprehensive understanding of the individual's swallowing problem.

Materials and Methods: The study examined 136 elderly receiving permanent or partial care but not signalized as dysphagic. The MMSE and the Barthel Index were used to assess cognitive and motor function respectively. The EAT 10 was used for self-reporting swallowing disorders. For evaluating the risk of dysphagia, participants were screened with the 3 ozwst. Also the body mass index was calculated (BMI).

Results and Discussion: About 40 % of the participants were found to be at risk of dysphagia. A significant relationship was reported between the participants' perceived level of dysphagia, BMI and the motor and cognitive function. The present study reflects the necessity of using a multidisciplinary approach, including self perception, to assess and prevent dysphagia consequences in an elderly population at risk.

OP.21

The Effect of Stressful and Relaxing Visual Stimuli on Upper Esophageal Sphincter Pressure

Kuhn, Maggie*¹; Domer, Amanda²; Robinson, Aaron³; Belafsky, Peter³

¹University of California, Davis, 2521 Stockton Blvd, USA; ²University of South Florida, USA; ³University of California, Davis, USA

Introduction: Dysfunction of the upper esophageal sphincter (UES) is associated with swallow disability and globus pharyngeus. Though auditory and chemical stimuli have previously been shown to influence UES pressure, the effect of visual stimuli on UES pressure has not been assessed. We sought to evaluate the influence of stressful and relaxing visual stimuli on UES pressure.

Materials and Methods: High-resolution manometry (HRM) was performed on 8 healthy patients with no history of dysphagia. Baseline UES pressures (mmHg) were established. Each subject was randomly presented stressful and calming images during separate trials. Pre- and post-visual stimulus data were blindly evaluated and compared with the paired samples T test.

Results: The mean age of the cohort was 30.6 (\pm 7.5) years. 87.5 % (7/8) was female. The mean UES baseline pressure was 44.8 (\pm 13.7) mmHg. When presented with the stressful image, average UES pressure increased to 52.6 (\pm 16.9) mmHg (p = 0.003). When presented with a calming image, average UES pressure decreased to 42.5 (\pm 13.3) mmHg (p = .213).

Discussion: Stressful imagery significantly elevated UES resting pressure in healthy adults. Calming imagery did not appear to influence UES pressure. These results may have clinical significance in the treatment of UES dysfunction and globus pharyngeus.

OP.22

Pharyngeal Pressure Flow Metrics are Independently Influenced by Age and Presence of Dysphagia

Liesenborghs, Claudia^{*1}; Omari, Taher²; Scheerens, Charlotte¹; Selleslagh, Margot¹; Cock, Charles³; Fraser, Robert³; Kritas, Stamatiki²; Van Oudenhove, Lukas⁴; Goeleven, Ann⁵; Dejaeger, Eddy⁶; Rommel, Nathalie¹

¹Translational Research Centre for Gastrointestinal Disease (TARGID)/Department Neurosciences (ExpORL); KU Leuven, Belgium; ²Women's and Children's Health Network, Australia; ³Repatriation General Hospital, Australia; ⁴Translational Research Centre for Gastrointestinal Disease (TARGID); KU Leuven, Belgium; ⁵Department of Neurosciences (ExpORL); KU Leuven, Belgium; ⁶Geriatrics, University Hospital Leuven, Belgium

Introduction: Swallowing problems are common in the elderly. The two factors considered responsible for this phenomenon are a higher prevalence of diseases associated with oropharyngeal dysphagia and a natural decline of swallowing ability with ageing. This study assessed the influence of ageing on swallowing function in dysphagic patients. Materials and Methods: 72 patients (47 M, mean 61 years, range 17-89 years) were referred for videomanometric assessment. The control group consisted of 68 healthy volunteers (29 M, mean 59 years, range 20-91 years) (Omari 2013). All underwent impedance manometry assessment using a high resolution solid-state catheter (OD 3.2 mm, 36 P at 1 cm, 12 Z at 2 cm). Liquid bolus swallows (5-10 ml) were analysed with Automated Impedance Manometry (AIM) (Omari 2011). Statistical analysis of pressure flow metrics was done using non-parametric two-way ANOVA comparing: (1) patients with healthy controls and (2) participants <60 and ± 60 years of age.

Results: Patients significantly differed from controls in 11 out of 13 AIM-metrics studied (Table 1). Participants under 60 years differed in 7 AIM-metrics in comparison to those over 60 years indicating higher aspiration risk, poorer bolus propulsion, reduced bolus clearance and poorer UES compliance in the aged. Some AIM-metrics were influenced solely by age or solely by dysphagia presence. The impact of dysphagia on AIM-metrics is present in both young and aged groups. The effect of ageing on AIM-metrics is present in both dysphagic and non-dysphagic groups.

Discussion: We conclude that pressure flow metrics in elderly dysphagic patients are influenced independently by disease presence and by increased age. Consequently, swallowing skills of these patients are challenged in a multifactorial fashion.

Table 1 Meadians [interquart	ile ranges] for liquid swallows
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AIM-metrics	AGE under ver	sus over 60 years		Controls versus Dysphagia			DYSPHAGIA* AGE (Interaction effect)
	<60 years	≥ 60 years	p- value	HV	Patients	p-value	p-value
Peak Pressure (mmHg)	128 [102–166]	121 [88–172]	.7546	140 [109–206]	113 [81–142]	<.0001*	.4918
Pressure at Nadir Impedance (mmHg)	11[4–17]	12 [5–29]	.0295*	9 [4–15]	15 [7–28]	0.0050*	.3493
Time from Nadir Impedance to Peak Pressure (ms)	400 [256–481]	327 [196–448]	.0399*	466 [412–501]	241[157–306]	<.0001*	.3140
Flow Interval (ms)	596 [331–931]	968 [555–1343]	.0080*	513 [329–903]	10214 [774–1556]	<.0001*	.7380
Swallow Risk Index	2 [1–9]	8 [2–16]	.0369*	2 [0.8–4.6]	12[0.8-4.6]	<.0001*	.1390
UES Relaxation Interval (ms)	685 [467-882]	756 [574–933]	.3270	585 [451–774]	825 [667–1079]	<.0001*	.1234
UES Nadir Pressure (mmHg)	2 [-4-5]	4 [-10-10]	.0238*	3[1-8]	2[-9-9]	.1389	.6767
UES Intrabolus Pressure (mmHg)	12 [15–19]	17 [9–34]	.0114*	15 [8-20]	14 [5–32]	.5079	.9650
UES Resistance (mmHg/s)	16 [8-32]	24 [12–47]	.0170*	23 [12-46]	18 [6–37]	.0606	.8469
UES Nadir Impedance (Ohms)	183 [162–295]	234 [181–382]	.1338	117 [159–218]	364 [204-465]	<.0001*	.6827
UES Pressure at Nadlmp (mmHg)	4 [-4-9]	6[1–13]	.4280	6[2–11]	2 [-11-9]	.0213*	.6160
Integrated Nadir Imp/Imp ratio	159 [69–322]	235 [115-438]	.2535	106 [62–158]	424 [224–604]	<.0001*	.6867
UES Post relaxation Peak (mmHg)	181 [146–284]	218 [161–342]	.1680	157 [140–173]	333 [233–405]	<.0001*	.4478

P-values <.05 are marked with * after non-parametric two-way ANOVA on ranks

OP.23

Perspectives on the Speech and Language Therapist's Role in Palliative Care: Results of an International Survey

O'Reilly, Aoife*1; Walshe, Margaret²

¹Trinity College Dublin, Department of Clinical Speech and Language Studies, Ireland; ²Trinity College Dublin, Ireland

Introduction: Palliative care (PC) aims to affirm life, minimise the complications of life limiting disease and maximise quality of life (Roe and Leslie 2010). Speech and language therapists (SLTs) can improve the quality of life of people receiving PC through management of their communication and swallowing difficulties (Tomblin and Mueller 2012). However, the role of the SLT in this area is poorly defined and little is understood about current international SLT practice in this area. **Materials and Methods:** A descriptive research approach was used with an anonymous, non-experimental, cross-sectional study design. Purposive and snowball sampling was used to recruit participants internationally using gatekeepers. An online survey was disseminated using Survey Monkey (www.surveymonkey.com).

Results: Three hundred and twenty (320) SLTs from Ireland, Germany, UK, Canada, Australia, USA, New Zealand and Singapore responded to the survey. Practices in this area were similar across continents. Current SLT practices as well the as barriers and facilitators to this practice were identified. The need for a position paper in this area was emphasised.

Discussion: Internationally, SLTs believe that they have a role in PC. Respondents acknowledged that the area of dysphagia management and communication is under-resourced, under-acknowledged and under developed. They highlighted the need for additional research as well as specialist training and education for SLTs as well as other MDT members.

OP.24

A Longitudinal Study of Risk of Pneumonia Death in Independently Living Older People with Symptoms of Dysphagia Identified on Questionnaire Survey

Nimmons, Danielle*; Michou, Emilia; Jones, Maureen; Pendleton, Neil; Horan, Mike; Hamdy, Shaheen

University of Manchester, UK

Introduction: Dysphagia has been estimated to affect around 11.4 % of healthy elderly people living in the community and aspiration pneumonia can be a harmful consequence. We aimed to longitudinally investigate whether dysphagia symptoms on questionnaire were associated with pneumonia deaths in an independently living elderly population.

Materials and Methods: 800 members of a community dwelling elderly cohort received the Sydney oro-pharyngeal dysphagia questionnaire via mail in 2009. A score of \geq 180 was indicative of significant dysphagia. In 2012, death certificates were analysed for those in the cohort who had died over the 3 year period. Logistic regression analyses were done to investigate whether dysphagia score and threshold were predictive of pneumonia deaths after adjusting for age and gender.

Results: 101 (19 %) subjects of the original cohort had died since 2009 and of these, 16 (15 %) subjects had pneumonia as a cause of death on death certificate. For those who later died of pneumonia, the median swallow score in 2009 was 50 and IQR was 62.75; compared to a median of 42 and IQR of 122.5 for those who died without pneumonia. Yet, logistic regression found no significant association between dysphagic symptom threshold, severity and pneumonia deaths in this cohort (p = 0.301, OR = 1.383, CI = 0.749–2.553).

Discussion: We found no compelling evidence that dysphagia symptom score on questionnaire survey predicted pneumonia deaths in this cohort of older people. The results suggest that symptoms (in contract to clinical signs) of dysphagia are not a reliable indicator of risk of pneumonia and death. This highlights the importance of understanding how swallowing changes with age and how symptoms vs. clinical signs of dysphagia affect the lives of elderly people.

OP.25

Attitudes, Knowledge, and Practices in the Provision of Oral Care: A Survey

Hill, Fiona*1; Ryan-Withero, Phillippa2; Connors, Siobhan3

¹Department of Speech & Language Therapy, Tallaght Hospital, Ireland; ²Nurse Practice Development, Tallaght Hospital, Ireland; ³Clinical Nursing Intensive Care, Tallaght Hospital, Ireland

Introduction: Inadequate oral care may predispose dependent hospitalised individuals to difficulties chewing, difficulties swallowing, and respiratory complications, including aspiration pneumonia. Despite the positive effects of appropriate oral care on health and quality of life there is a paucity of local, national, and international evidence based oral care guidelines. Consequently, variability exists in the management of oral care. The aim of this study is to explore attitudes, knowledge, and oral care practice patterns of hospital healthcare staff.

Methods: 92 healthcare staff from a sample of neurological, agerelated, intensive care, and general medical wards of an acute hospital completed an oral care survey. The questions explored demographics, attitudes, clinical knowledge and training, practices, and resources.

Results: 52 % of respondents had more than 10 years clinical experience. Although the majority viewed oral care as an important aspect of patient care over half did not recognise its importance in preventing respiratory infection. Almost one third had not received training in assessment (33 %) and provision (27 %) of oral care, and half requested initial/further training. Half of respondents were unsure or reported that no oral care protocol existed on their ward. 21 and 39 % did not routinely use toothbrushes or toothpaste, respectively, while 72 % of respondents consistently used foam sponges for oral care. Factors influencing attention to oral care included patients' condition, status of oral cavity, and workload and time constraints.

Discussion: Findings of this research support the need for oral care educational initiatives for healthcare staff and development and promotion of quality evidence based oral care protocols in the hospital sett.

OP.26

'Yes, We Can Eat' Ireland's First Feeding Tube Weaning Programme for Children with Complex Cardiac and Medical Conditions

Butler, Celia*¹; Greene, Zelda²

¹Our Lady's Children's Hospital, Crumlin, Ireland; ²Our Lady's Children's Hospital Crumlin, Ireland

Introduction: As a consequence of life saving complex medical and surgical interventions, an increasing number of infants are tube fed.

Following surgery a significant number of infants remain 'tube dependent'. In 2012; 89 % of paediatric referrals to a Cardiology Speech and Language Therapy (SLT) Service were tube fed. To address this the Cardiology service established Ireland's first Multidisciplinary (SLT, Dietitian, Psychologist, Play Specialist, Medical, Nursing) 'Yes, We Can Eat' intensive paediatric tube weaning programme.

Method: 51 infants (25 Female, 26 Male-age range 6–72 months; average age 21.5 months) with a range of medical diagnoses attended the programme (September 2008–December 2012). The average length of inpatient stay-20 days. A strict protocol was followed: Infants had appropriate and safe reduction of tube feeds and by days 5–8 the tube feeds were stopped. Infants were monitored daily by the Medical team and Dietitian. Infants attended daily 'messy picnic' with the SLT and Clinical Psychologist. If Infants were medically stable, parents were encouraged to have time outside of the hospital with their child.

Results: 45/51 participants successfully tube weaned. Of the four cases who did not wean; one child had a suspected metabolic condition, one child had aspiration pneumonia secondary to reflux and two children experienced excessive weight loss. Two participants were partially tube weaned. Range of weight loss 0-22 % (average 8.1 %). The success rate 88 %.

Discussion: Establishment of oral feeding is fundamental to a child's global and nutritional development. This multidisciplinary approach is successful in tube weaning children with complex medical backgrounds. Longer term outcomes need to be assessed.

OP.27

Validation and Psychometric Analysis of the Dutch Version of the SWAL-QOL (DSWAL-QOL)

Vanderwegen, Jan*1; Van Nuffelen, Gwen2; De Bodt, Marc2

¹UMC Saint-Pierre, Hoogstraat 322 (ORL), Belgium; ²Antwerp University Hospital, Belgium

Introduction: The aim of this study was to translate, validate and study the psychometric properties of the Dutch version of the SWAL-QOL. This will provide a reliable tool to measure quality of life in patients with oropharyngeal dysphagia.

Methods: The original SWAL-QOL was translated into Dutch according to international guidelines. 268 patients with stable dysphagia of different etiologies (head and neck cancer, stroke, degenerative neurological disorders) and 124 healthy subjects filled out the questionnaire; 50 patients were recruited for a 2-week test-retest reliability.

Results: The mean age of the study population was 67.8 yo; 66 % were males, 12 and 4 % were on nonoral food and liquid status respectively. All DSWAL-QOL subscales were non-normal distributed with a negative skew and several ceiling effects, but the full range of score distribution was observed. Internal consistency using Cronbach's alpha showed that only one scale (sleep) failed to reach the 0.80 standard. Spearman's rho and Intraclass Correlation Coefficient showed the test-retest reliability to be 0.78 and 0.794 (median values). Principal components analysis with oblique rotation yielded 6 components (1: eating desire, food selection, burden and eating duration; 2: fatigue and sleep; 3: symptoms; 4: social functioning; 5: communication; 6: fear and mental health). Clinical validity showed significant results of the DSWAL-QOL in discriminating healthy and dysphagic patients, tube-feeders versus oral feeders, patients on normal versus soft or pureed diet, and patients on thin versus thickened or no liquids.

Discussion: The DSWAL-QOL combines acceptable psychometric properties and good clinical validity, making it an excellent tool to examine the impact of dysphagia on quality of life in Dutch-speaking patients.

OP.28

A Hint Towards Objective Cortical Correlates of Functional Dysphagia

Suntrup, Sonja^{*1}; Teismann, Inga²; Warnecke, Tobias²; Suttrup, Inga²; Hamacher, Christina²; Pantev, Christo³; Dziewas, Rainer²

¹Department of Neurology/University of Muenster, Albert-Schweitzer-Campus 1, Germany; ²Department of Neurology/ University of Muenster, Germany; ³Institute for Biomagnetism and Biosignalanalysis/University of Münster, Germany

Background: Psychogenic or "functional" dysphagia is a rare phenomenon of largely unknown etiology. However, current research on functional disorders provides growing evidence for objective neuronal correlates of allegedly psychogenic symptoms. This study investigated whether functional dysphagia is associated with alterations in the cortical swallowing network.

Methods: Five patients diagnosed with functional dysphagia after thorough neurological, gastroenterological and ENT examination participated in this study. We assessed swallow-related cortical activation applying whole-head magnetoencephalography and statistically compared the activation pattern to that of an age- and gender-matched healthy subject group using a nonparametric permutation algorithm.

Results: Swallow performance did not differ between groups in terms of total swallow count, submental EMG power and amplitude. Compared to healthy volunteers, patients showed increased activation in the insula, dorsolateral prefrontal cortex and lateral premotor, motor as well as inferolateral parietal cortex of the right hemisphere (p < 0.01).

Discussion: These regions are known to constitute interfaces between inner perception of body signals, cognitive appraisal, attentional control and higher order sensorimotor processing. Disturbed interaction in these network hubs may be related to enhanced selfmonitoring leading towards functional symptom perception during otherwise normal deglutition. The observed changes may either represent pre-existing vulnerability or a form of maladaptive cortical plasticity arising from the patient's persistent mental fixation on his deglutition. In any case our results provide a possible mechanistic explanation for a condition that is generally said to be of psychogenic origin.

OP.29

Usefulness of Citric Cough Test for Screening of Silent Aspiration in Subacute Stroke Patients: A Prospective Study

Guillén-Solà, Anna*¹; Chiarella, Sandra²; Martínez-Orfila, Joan²; Alvarado Panesso, Martha Ligia²; Bas Costas, Núria²; Figueres Cugat, Antoni²; Marco, Ester²

¹Hospitals Mar-Esperança-Parc de Salut Mar, Sant Josep de la Muntanya 12, Spain; ²Hospitals Mar-Esperança, Parc de Salut Mar, Spain **Introduction:** To assess the usefulness of the cough test with citric acid aerosol (CCT) to detect silent aspiration in stroke patients.

Materials and Methods: Prospective study of a consecutive stroke patients (N = 134; 74 men, 60 women; mean age 62.2 years, SD 11.9 years) who had complained of dysphagic symptoms from December 2010 to October 2012 in a Tertiary University Public Hospital. All patients were administered a CCT and underwent videofluoroscopic swallowing study (VFS). After five peaks of coughing, citric acid inhalation was terminated when the next cough occurred. Healthy volunteers were also screened.

Results: Disability was moderately severe in 33.6 % in the modified Rankin scale. Barthel index at admission was 42.8 (SD 18.6), with a moderate, negative correlation between the Penetration Aspiration Scale and the Barthel Index at admission (r = -0.369, p < 0.001) and at discharge (r = -0.430, p < 0.001). In the total sample with a positive CCT, the VFS revealed penetration in 14 (38.9 %) cases, aspiration in 5 (13.9 %), silent aspiration in 5 (13.9 %) and normality in 12 (33.3 %) patients. The sensitivity and specificity indexes for determining the reliability of the CCT as a screening method for silent aspiration in comparison with the VFS were 0.19 and 0.71, respectively. Other comparisons were made between silent aspirators (PAS = 8) and different subgroups of patients but values of sensitivity, specificity, efficiency and predictive values remained very poor. The CCT also was not useful to classify aspirators and nonaspirators.

Conclusion: The CCT not a useful screening tool for silent aspiration in patients with stroke.

OP.30

Are Screening Procedures Useful in Postacute Dysphagic Patients?

Ledl, Christian*¹; Heller, Christina²; Hinterberger, Kathrin²; Houamed, Miriam²; Klabuschnig, Melanie²

¹Schoen Klinik Bad Aibling, Kolbermoorerstrasse 72, Germany;
²Schoen Klinik Bad Aibling, Germany

Introduction: Several procedures have been proposed to screen acute patients for dysphagia. Criteria comprise water tests in combination with judgments on lingual pareses, voice change, the presence of dysarthria or delayed swallow. This study aims to compare the predictiveness of various screening procedures on aspiration of saliva, fluids and puree in patients with postacute dysphagia.

Method: In 27 patients, FEES, Toronto Bedside Swallowing Screening Test (TOR-BSST), Daniels Test and swallow provocation tests (0.4 and 2.0 ml volumes) were performed within 6 h. Patients were 68.7 years old and 80.4 days post onset (mean values). Etiologies were ischemic stroke (7), hemorrhagic stroke (7), neuropathies (7), TBI (3) and others (3). Saliva, water (5 ml) and puree were tested during FEES (reference procedure) and raters were blinded to the results of the screening tests.

Results: TOR-BSST reached 100 % sensitivity for all consistencies; Daniels achieved 95 % sensitivity for fluids, 100 % for saliva and puree. The 0.4 and 2 ml (in parentheses) provocation tests obtained 77 % sensitivity (25) for saliva, 63.2 % (77.8) for fluids and 100 % (100) for puree. Specificity values were low and differed for various consistencies (TOR-BSST: 7.1, 14.3, and 3.8 % for saliva, fluids and puree; Daniels: 28.6, 42.9, and 15.4 %; 0.4 provocation: 38.5, 14.3, and 33.3 %; 2.0 provocation: 46.2, 71.4, and 39.1 %).

Discussion: TOR-BSST and Daniels tests detect aspiration reliably but overestimate the presence of dysphagia in chronic patients. The clinical relevance of these procedures in postacute patients is restricted due to the high number of false positives. The 2 ml provocation test reaches sufficient sensitivity and specificity for fluids but fails to predict results for saliva and puree.

OP.31

Prevalence of Oropharyngeal Dysphagia in the Netherlands: A Telephone Survey

Kertscher, Berit*1; Speyer, Renée2; Speyer, Renée3; Heijnen, Bas3

¹Institute of Health Studies, HAN University of Applied Sciences, The Netherlands; ²School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Australia; ³Department of Otorhinolaryngology and Head and Neck Surgery, Leiden University Medical Center, The Netherlands

Introduction: Oropharyngeal dysphagia is a common problem and comorbidity among various patient groups and puts a patient at risk for pneumonia, malnutrition and possibly death. However, recent and specific figures of prevalence are often missing. This pilot study investigated the prevalence of dysphagia in the Netherlands as retrieved by a telephone survey.

Methods and Materials: In order to acquire the general prevalence of oropharyngeal dysphagia in the Dutch population, the Eating Assessment Tool (EAT-10 questionnaire) has been conducted over the phone using a standardized protocol. The EAT-10 is a validated questionnaire containing ten questions about solid intake, fluid intake and swallowing.

Results: In total, 6,700 persons were reached by telephone. 2,609 persons (39 %) agreed to participate. The participants were divided into eight age groups. Based on the EAT-10 outcome, prevalence data per age group differed from 3.3 % (30–39 years) to 28.4 % (80–89 years). In total 219 participants (8.4 %) scored a score of three or higher on the EAT-10 questionnaire indicating swallowing abnormalities.

Discussion: 8.4 % of the participants, representing a random selection of the general Dutch population, showed abnormalities in swallowing. As expected, the risk of oropharyngeal dysphagia increased with age. Most participants having difficulties in swallowing experienced extensive problems with swallowing pills.

OP.32

Validation of the Italian SWAL-QOL

Schindler, Antonio*¹; Ginocchio, Daniela²; Vedrodyova, Miriam²; Farneti, Daniele³; Chiarello, Giulia³; Simonelli, Marilia⁴; Calcagno, Paola⁴; Accornero, Anna³

¹Department of Biomedical and Clinical Sciences "L. Sacco", Via GB Grassi 74, Italy; ²Maugeri Foundation, Italy; ³ENT Department, Italy; ⁴IRCCS S. Lucia, Italy

Introduction: The SWAL-QOL is a questionnaire currently adopted for the assessment of dysphagia-related disability in patients with dysphagia of different origin. The SWAL-QOL is available in English, Dutch, Chinese, Swedish, while no Italian version is available. The aim of the study is to analyze reliability and clinical validity of the Italian SWAL-QOL. **Materials and Methods:** Six different dysphagia centers were involved in this cross-sectional study. The study consisted of four phases: item generation, internal consistency and reliability analysis, normative data generation, validity analysis. Discussion of SWAL-QOL with 30 patients and its back translation were accomplished. The final version was checked for readability. Recruited population included 90 patients and 200 asymptomatic subjects to test internal consistency, 78 dysphagia patients for test-retest reliability analysis. Normative data were gathered from the 200 subjects. The scores of patients and asymptomatic subjects were compared. SWAL-QOL and fiberoptic endoscopic evaluation of swallowing (FEES) scores in 78 patients were correlated through Spearman test.

Results: The Italian SWAL-QOL is readable to people of five year of education. Excellent internal consistency and strong test-retest reliability were found. SWAL-QOL mean score of the normal cohort was 210.1 ± 5.1 . Asymptomatic patients scored higher than dysphagic patients on Mann–Whitney test (p = 0.001). SWAL-QOL and FEES scores mildly correlated.

Discussion: The Italian SWAL-QOL is reliable and valid; it application in everyday clinical practice is recommended.

OP.33

Clinical Variables Influencing Screening Time During Videofluoroscopy

Hill, Fiona*; Keane, Julie; Flynn, Eadaoin; Gallagher, Ruth; Farrell, Eric; Murphy, Maeve

Department of Speech & Language Therapy, Tallaght Hospital, Ireland

Introduction: Videofluoroscopy (VFS) is an important instrumental examination for evaluating oropharyngeal swallow biomechanics and interventions. Radiation exposure must comply with the As Low As Reasonably Achievable (ALARA) principle but numerous variables may influence fluoroscopy screening time. This study examines the impact of Speech and Language Therapist (SLT) experience, dysphagia severity, and screener on fluoroscopy screening time.

Methods: A retrospective review was carried out on 1,006 adult VFSs completed over a five year period in a Dublin Academic Teaching Hospital. The VFSs were carried out jointly by SLTs and radiologist or radiographer. SLT VFS experience, dysphagia severity, screener (i.e. radiologist or radiographer) and fluoroscopy screening time were the variables recorded for analysis.

Results: Average fluoroscopy screening time was 5.3 min (95 % confidence interval: 5.17–5.47 min). Fluoroscopy screening time was not associated with screener (p = 0.05). Greater dysphagia severity resulted in statistically significant increases in screening time (p < 0.001). SLTs with more VFS experience had significantly shorter fluoroscopy screening time (p < 0.001). These effects were independent (by linear regression).

Discussion: While the average screening time found in this study is above recently reported averages, the study supports previous research findings on the impact of SLT VFS experience and dysphagia severity on VFS screening time. Therapists should be cognisant of these influences in their clinical practice and strive to minimise their effects with robust procedures. Further research is needed to investigate the impact of other patient and procedural factors which may significantly influence patient radiation exposure during VFS.

The Influence of Age, Sex and Visual Feedback on Maximum Lip Strength and Endurance in Healthy Belgian Adults

Vanderwegen, Jan*¹; Guns, Cindy²; Van Nuffelen, Gwen²; Elen, Rik³; De Bodt, Marc²

¹UMC Saint-Pierre, Hoogstraat 322 (ORL), Belgium; ²Antwerp University Hospital, Belgium; ³Thomas More, Belgium

Introduction: To investigate the influence of age, sex, and visual feedback on maximum lip strength and endurance in healthy Belgian adults. Normative data will be determined to allow for future use. Methods: The IOPI (Iowa Oral Performance Instrument) device was used to determine lip closing force and endurance (at 50 % of maximum force) in 420 healthy adults, aged between 20 and 95 yo. The number of males and females was equally distributed per decade of age. None of the participants had a history of dysphagia, oral cavity surgery, dyspnea, dysarthria, apraxia or playing wind instruments. The measurements were made according to standardized instructions. Results: Lip strength showed a normal distribution; endurance was log10-transformed to reach normality. Maximum lip strength in males of 71-80 yo showed a minor but significant decrease while no change in lip strength in females of different ages could be found. Endurance displayed a marked decrease in males older than 71 yo and females older than 80 yo. Comparing sexes demonstrated higher lip strength for males in only two decades and no differences for lip endurance. All subjects attained higher maximum lip pressures when using biofeedback. There were no significant differences between the three trials to attain maximum lip pressures.

Discussion: In this large sample, lip strength and endurance related parameters were investigated. Our data show that lip strength remains almost stable across the life span. Lip endurance decreases by the seventh decade of life. Only minor differences between sexes are found. Our normative data will prove valuable in assessing lip function in dysphagic and dysarthric patients and to better plan rehabilitation therapy.

OP.35

Correlation of Health-Related Quality of Life with Swallowing Performance in Patients with Locally Advanced Head-Neck Cancer Treated with Chemoradiation

Xinou, Ekaterini^{*1}; Kynigou, Maria²; Chrysogonidis, Ioannis³; Printza, Athanasia⁴; Kelekis, Anastasios³; Iliopoulou, Chryssoula²; Andreadis, Charalampos²; Mangoudi, Doxa²; Panagiotopoulou-Mpoukla, Dimitra²

¹Theagenion Anticancer Hospital, Al. Simeonidi 2, Greece; ²Theagenion Anticancer Hospital, Greece; ³AHEPA University Hospital, Greece; ⁴Papageorgiou University Hospital, Greece

Introduction: The aim of this study was to assess the longitudinal changes of HR-QoL and to test the hypothesis that a worse swallowing performance severity scale (SPSS) correlates with a lower health-related quality of life (HR-QoL) both before and after concurrent chemoradiation (CRT) in patients with locally advanced headneck cancer (HNC).

Materials and Methods: In this prospective, longitudinal study, 41 patients with locally advanced HNC were treated uniformly with CRT (with or without induction chemotherapy). Overall QoL was assessed by summary scores of the EORTC QLC 30 and H&N 35 questionnaires. Quality of life and objective evaluations (SPSS scoring of videofluoroscopic study) were recorded longitudinally starting before initial treatment and ending at 12 months following therapy. Correlations between SPSS and overall QoL were assessed using longitudinal repeated measures of analysis and Pearson correlations. Results: Almost all QoL scores worsened 1 month after therapy and improved at 3 and 6 months, with minor further improvements at 12 months. The highest symptom score on QLQ-C30 was for fatigue, followed by financial problems and appetite loss. In the H&N35 module, dry mouth, sticky saliva, and senses problems ranked as the three worst symptoms. Global health status (QoL) score showed a correlation with SPSS only before therapy (p = 0.031). A high correlation (p < .0001) of SPSS with swallowing, coughing and trouble with social eating was noted before therapy, whereas after therapy this correlation was lower.

Discussion: The results of the study suggest that HR-QoL is not correlated with SPSS after treatment and that despite worse swallowing patients experience a better quality of life after therapy.

OP.36

Prevalence of Dysphagia as a Long Term Complication of Head and Neck Radiotherapy

Szczesniak, Michal*¹; Maclean, Julia²; Zhang, Teng³; Graham, Peter⁴; Cook, Ian³

¹Department of Gastroenterology and Hepatology, St George Hospital, Australia; ²Speech Pathology Department, St George Hospital, Australia; ³Department of Gastroenterology and Hepatology, St George Hospital, Australia; ⁴Department of Radiation Oncology, Cancer Care Centre, St George Hospital, Australia

Introduction: The aim of this study was to determine the prevalence, severity, morbidity and time course of dysphagia symptoms after head and neck radiotherapy (>1 year).

Materials and Methods: An observational cross-sectional study was conducted in a large consecutive series of head and neck cancer patients. All patients on the St George Hospital Cancer Care database, who had received head and neck radiotherapy or chemo-radiotherapy with curative intent 0.5–8 years previously (2004–2011) and recorded as being alive were surveyed by the SSQ. Causes of mortality were assessed from medical records (n = 101).

Results: Patients were surveyed a mean 3 years post radiotherapy. From initial mail out of 124 questionnaires, response rate was 83/124 (67 %). Impaired swallowing (SSQ Score >234) was reported in 59 % of patients. Most frequent complaints were (1) difficulty swallowing hard foods, (2) difficulty swallowing dry foods, (3) feeling of food getting stuck in throat and (4) coughing and choking when swallowing solid foods. Neither age, tumour location, adjuvant treatments nor time from radiotherapy had any effects on severity of self-reported dysphagia. Record review revealed that cancer accounted for 61 % (62/101) of deaths and aspiration pneumonia was responsible for 18 % (7/39) of non-cancer-related deaths. Nineteen patients died of other causes, and in 13 the cause was unknown.

Discussion: Dysphagia is a very prevalent long term complication of head and neck radiotherapy and aspiration pneumonia is a causing significant mortality in this population.

Two-Year Results of a Prospective Preventive Swallowing Rehabilitation Trial in Patients Treated with Chemoradiation for Advanced Head and Neck Cancer

van der Molen, Lisette $*^1$; van Rossum, Maya A.²; Rasch, Coen R. N.³; Smeele, Ludi E.⁴; Hilgers, Frans J. M.⁴

¹The Netherlands Cancer Institute, Plesmanlaan 121, The Netherlands; ²Previously affiliated with the University Medical Centre Leiden, The Netherlands; ³Department of Radiation Oncology, Academic Medical Centre/University of Amsterdam, The Netherlands; ⁴Department of Head and Neck Oncology & Surgery, The Netherlands Cancer Institute, The Netherlands

Introduction: The addition of chemotherapy to radiotherapy is associated with a substantial increase in early and late toxicities. Keeping the involved musculature active during CCRT despite cessation of swallowing, might be a valuable adjunct to the reduction of the radiation dose. In this presentation, the long term (2-year) overall results of preventive exercising are presented, as are subgroup analyses according to exercise regime and site of disease.

Materials and Methods: The study cohort consisted of 29 patients, randomized in two exercise groups: a standard (S) group receiving routine swallowing exercises (N = 14), and an experimental (E) group receiving swallowing exercises based on TheraBite Jaw Motion Rehabilitation system (N = 15). Assessment of functional changes was carried out with multidimensional outcome-measures (e.g. video-fluoroscopy, study-specific questionnaires) at 4 time points (pretreatment, at 10-weeks, 1-year, and 2-years post-treatment).

Results: Overall, in the first year post-treatment many initial tumor-, and treatment-related problems diminished significantly, except xerostomia (59 %). The only additional improvement at 2-years is that overall weight significantly further increased (p = .000), however, without regaining baseline value. In the subgroup analysis according to exercise group, this difference was significant in the E-group only (p = .002). The same was the case for the subgroup analysis according to site of disease, with a significant weight gain in the 'below the hyoid bone' group only. Feasibility and compliance of both preventive exercise programs were good.

Discussion: This study shows that overall functional problems at 1and 2-years post CCRT are limited. Both rehabilitation programs produce similar results, with a slight but significant benefit for the E-group in weight gain at 2 years, as also seen in the 'below the hyoid bone' group. Both rehabilitation programs applied are feasible and show good compliance despite the burdensome CCRT.

Abstracts

OP.38

Prophylactic Swallowing Exercises on Dysphagia After Radiotherapy for Head and Neck Cancer—A Prospective Randomized Phase II Trial

Mortensen, Hanna R.*¹; Jensen, Kenneth²; Aksglæde, Karin³; Lambertsen, Karin⁴; Behrens, Marie⁵; Eriksen, Eva⁵; Grau, Cai²

 ¹Department of Oncology, Aarhus University Hospital, Denmark;
 ²Department of Oncology, Aarhus University Hospital, Denmark;
 ³Motility Laboratory, Department of Gastroenterology L and Department of Radiology, Aarhus University Hospital, Denmark;
 ⁴Department of ENT Head and Neck Surgery, Aarhus University Hospital, Denmark; ⁵Department of Occupational Therapy and Physiotherapy, Aarhus University Hospital, Denmark

Introduction: Many head and neck cancer survivors experience reduced quality of life due to radiotherapy (RT) related dysphagia. The aim of this randomized trial was to evaluate the impact of prophylactic swallowing exercises on swallowing in head and neck cancer patients treated with RT.

Materials and Methods: Consecutive patients treated with curative RT for laryngeal, pharyngeal or oral cavity cancer were eligible. Participants in the treatment group performed swallowing exercises at home for 10 repetitions 3 times a day, beginning at start of RT and onwards. The control group were given standard care. The exercises intended to increase strength and range of movement of jaw, base of tongue, pharyngeal constrictors, laryngeal elevators including supra-hyoid muscles. Participants were followed until 11 months post-RT (Table 1) and evaluated with Modified Barium Swallow at 4 timepoints and Quality of life questionnaires (EORTC C30 and H&N35) at 9 timepoints. Data were analysed according to intention-to-treat.

Results: A total of 44 patients were included; 22 in each group. Median age 61 years, 82 % men, 73 % stage IV disease and 45 % received con-comitant cisplatin. There was no difference between the groups regarding dysphagia score and tube feeding. Similarly there was no difference between groups in any of the Quality of life subscales Oor the MBS findings and there was no change over time. Compliance was moderate, 41 % in the intervention group exercised at least once a day in the 5th week of treatment; half of these had some degree of pain in relation to the exercises. Updated results will be presented.

Conclusion: Systematic swallowing exercises during/after treatment had no impact on subjective or objective swallowing outcomes within the first two months after RT.

Table	1	Training	protocol
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	Pre- RT	1. Week	3. Week	5. Week	14 Days post-RT	2 Months post-RT	5 Months post-RT	8 Months post-RT	11 Months post-RT
Inclusion and randomization	_								
Modified Barium Swallow	-					_	_		_
QoL questionnaire	-	-	-	-	-	_	_	_	_
Swallowing diary (intervention group)	-	-	-	-	-	-	_	-	-
Swallowing exercises (intervention group)	-	-	-	-	-	_	_	_	-
Weight	_	-	-	-	-	-	-	-	-

Dysphagia and Feeding Management After Supracricoid Laryngectomy

Pizzorni, Nicole*¹; Scarponi, Letizia²; Ginocchio, Daniela³; Schindler, Antonio²

¹Department of Biomedical and Clinical Sciences "L. Sacco", University of Milan, Milan, Italy, Via Abruzzi 6K, Italy; ²Department of Biomedical and Clinical Sciences "L. Sacco", University of Milan, Milan, Italy; ³IRCCS "Salvatore Maugeri", Italy

Introduction: Supracricoid laryngectomy (SCL) is increasingly performed all over the world for the treatment of selected laryngeal cancers. The aim of the study is to describe the management of dysphagia and feeding in the early stage after SCL.

Materials and Methods: 22 patients who underwent SCL (8 females, 14 males), aged 67 ± 4 years (range 56–78) have been included in the study. Each patient underwent fiberoptic endoscopic evaluation of swallowing (FEES) with both a trans-nasal and trans-tracheostomy approach 4 days after surgery and with week intervals in order to decide the rehabilitation program and when to start oral feeding. Penetration aspiration scale (PAS), pooling score (PS) and Dysphagia outcome and severity scale (DOSS) were used for quantification of FEES.

Results: The criteria applied in order to start oral feeding after SCL were: PAS < 7 with at least one consistency and the possibility to introduce at least 1,500 Kcal/die (DOSS > 2). Eight patients underwent PEG before surgery, while in 14 patients a nasogastric tube was inserted after surgery. No case of pulmonary complication was found, but in 2 patients oral feeding could not be achieved. In the remaining 20 patients the mean length of enteral feeding was 34 days (range 14–78). The mean number of FEES per patients was 8 (range 5–12) before oral feeding.

Discussion: FEES is an optimal tool for the management of oropharyngeal dysphagia after SCL, since it allows when to start oral feeding avoiding pulmonary complications. The application of FEES after SCL is suggested.

OP.40

Use of the Modified Barium Impairment Profile (MBSIMP) Scoring in Clinical Practice: 1-Year Experience in an Oncologic Hospital in Greece

Xinou, Ekaterini*¹; Kynigou, Maria²; Chrysogonidis, Ioannis³; Printza, Athanasia⁴; Iliopoulou, Chryssoula²; Andreadis, Charalampos²; Mangoudi, Doxa²; Pazaitou-Panayiotou, Kalliopi²; Panagiotopoulou-Mpoukla, Dimitra²

¹Theagenion Anticancer Hospital, Al.Simeonidi 2, Greece; ²Theagenion Anticancer Hospital, Greece; ³AHEPA University Hospital, Greece; ⁴Papageorgiou University Hospital, Greece

Introduction: MBSImPTM[©] is a new modified barium swallow rating tool, which provides a standardized objective assessment of videofluoroscopic studies (VFSS). The aim of this study was to examine the feasibility and the clinical usefulness of MBSImPTM[©] scoring in clinical treatment protocol in an oncological hospital in Greece.

Materials and Methods: Between April 2012 and May 2013, 317 VFSS were performed in 208 patients (132 males/76 females; age range 27–89 years). All studies were completed by a radiologist

trained/certified in the data collection protocol, interpretation and scoring of the MBSImPTM©. Radiation exposure and time needed to complete MBSImPTM© overall impression form was calculated in all studies.

Results: The majority of the studies were performed in patients with head-neck (80 %), lung (9 %) and breast cancer (3 %). Average radiation exposure time using the MBSImPTM© approach was 3.4 min (range 1.9–4.9 min) and the average time needed to complete MBSImPTM© overall impression form was 13 min. Comparison of the oral score, the pharyngeal score and the score of the individual parameters within each patient permitted a better objective evaluation of swallowing improvement or deterioration and an easier communication with the clinicians.

Discussion: The results of this study suggest that MBSImPTM© scoring is feasible and practical in everyday practice. It does not lead to unnecessary radiation exposure during VFSS and facilitates comparison between and within patients.

OP.41

Inter-Rater Reliability of Automated Impedance-Manometry (AIM) Analysis and Fluoroscopy in Patients with Dysphagia Following Head and Neck Radiotherapy

Szczesniak, Michal^{*1}; Omari, Taher²; Maclean, Julia³; Liu, Rong⁴; Cook, Ian⁵

¹Department of Gastroenterology and Hepatology, St George Hospital, Australia; ²School of Paediatrics and Reproductive Health, Australia; ³St George Hospital, Department of Speech Pathology, Australia; ⁴Department of Geriatric Medicine, The First Hospital of Lanzhou University, China; ⁵University of New South Wales, St George Clinical School, Australia

Introduction: AIM is new non-radiological method to analyse impedance-derived bolus flow and pressures measured during the pharyngeal swallow. We compared the inter-rater reliability of videofluoroscopy in assessing post-swallow residue to that of AIM-derived residue measure (iZn/Z) and the swallow risk index (SRI) in a population of patients with dysphagia following head and neck radiotherapy.

Materials and Methods: From 16 patients, 86 videofluoroscopic swallows were classified into aspiration, penetration or no aspiration-penetration by three blinded experts (Rosenbek 1996). The iZn/Z (measure of post-swallow residue) was derived for a post-swallow region spanning the mid-point of the pharyngeal stripping wave to the proximal margin of the upper oesophageal sphincter, and from 0.25 to 1.25 s after the peak of the pharyngeal stripping wave. The iZn/Z was evaluated by 1 expert and 2 novice observers.

Results: Among individual swallows, agreement among observers assessing penetration and aspiration on videofluoroscopy was modest with intra-class correlation coefficient (ICC) of 0.57 [0.46, 0.68]. Agreement among observers for AIM-derived swallow risk index (SRI) and the iZn/Z was good with ICC 0.78 [0.74, 0.82] and ICC 0.79 [0.74, 0.82]. When compared with historical age-matched controls, the SRI was higher in patients with aspiration Δ 30 [55.8, 4.6, p < 0.05] as was iZn/Z, in patients with aspiration (Δ 244 [419.7, 69.52, p < 0.05]) or penetration (Δ 240 [394.3, 85.77, p < 0.05]).

Discussion: The AIM-derived markers of residue (iZn/Z) and global index of swallowing dysfunction (SRI) are reliable and easily determined objective non-radiological markers of clinically relevant features of disordered swallowing after head and neck radiotherapy.

Effortful Swallowing Does Not Affect Strength of Pharyngeal Contraction, Rather Its Timing with Bolus Flow: An Automated Impedance Manometry (AIM) Analysis

Scheerens, Charlotte^{*1}; Vermeyen, Bénédicte²; Van Oudenhove, Lukas³; Selleslagh, Margot¹; Dejaeger, Eddy⁴; Goeleven, Ann²; Oustamanolakis, Pantelis³; Tack, Jan³; Omari, Taher⁵; Rommel, Nathalie¹

¹Translational Research Center for Gastrointestinal Disorders and ExpORL Department of Neurosciences, Belgium; ²ExpORL Department of Neurosciences, Belgium; ³Translational Research Center for Gastrointestinal Disorders, Belgium; ⁴Geriatric Medicine, Belgium; ⁵Gastroenterology Unit, Child, Youth & Women's Health Service, Australia

Introduction: The effortful swallow (ES) is designed to increase tongue base to posterior wall contact in patients with reduced oropharyngeal pressure, hereby improving bolus clearance. However, the effect of bolus volume and consistency on swallowing during this maneuver is unclear. Hence, we aim to quantify the effect of ES on pressure flow metrics and its interaction with bolus volume and consistency in healthy subjects.

Materials and Methods: 12 healthy controls (6 M, mean age 32 years, 21–53 years) swallowed 3 bolus consistencies (liquid, semisolid, solid) in 2 volumes (small [5 ml, 2 cm²] or large [10 ml, 4 cm²]). All swallows were recorded with combined high resolution manometry-impedance (36P12Z) and analyzed using AIMplot software, deriving swallow metrics for the pharynx and upper esophageal sphincter (UES). Different mixed models were estimated with each AIM metric as dependent variable, and volume, consistency and head posture as within-subject independent variables. Pairwise differences were tested using post-hoc t-tests corrected for multiple comparisons. **Results:** No significant effect of ES on pharyngeal peak pressure was found (p = 0.4). ES significantly increased time from nadir impedance to pharyngeal peak pressure (p < 0.0001), indicating improved bolus propulsion compared to head neutral position.

Discussion: This study shows that ES does not increase the strength of the pharyngeal contraction, but rather influences its timing with bolus flow. We believe this observation may be clinically relevant as ES is often the maneuver of choice in patients with pharyngeal hypocontractility. Our finding may contribute to the understanding of inconsistent treatment success while using this swallow maneuver.



Table 1 Swallow protocol with the number of swallows per volunteer

		Head Neutral	Effortful Swallow	Total
Liquid	5 ml	5	2	7
liquid	10 ml	5	2	7
Semisolid	5 ml	5	2	7
Semisolid	10 ml	5	2	7
Solid	2 cm^2	5	2	7
Solid	4 cm^2	5	1	6

OP.43

Localization and Expression of TRPV1 Receptors in Sensory Areas of the Human Oropharynx

Alvarez-Berdugo, Daniel*¹; Casamitjana, J. Francesc¹; Enrique, Ana¹; Rofes, Laia²; Clavé, Pere²

¹Hospital de Mataró, CSdM, Spain; ²CIBERehd, Instituto de Salut Carlos III, Spain



Confocal microscope image from human pharynx marked with anti-TRPV1 antibody (red) and antiPGP9.5 antibody (green). Cell nuclei are marked with Hoechst (blue). TRPV1 signal is found in the basal lamina of the epithelium and in some nerves innervating the epithelium

Introduction: In earlier studies, we demonstrated that stimulation of TRPV1 with capsaicinoids improved swallow response in patients with oropharyngeal dysphagia (OD) suggesting that TRPV1 agonists could become useful pharmacological tools in the treatment of OD. TRPV1 expression has been explored in animal models but there is little information for humans. We aimed to characterize the quantitative expression and cellular type localization of TRPV1 receptors in the human oropharynx using RT-qPCR and immunofluorescence.

Materials and Methods: Human biopsies from areas innervated by cranial nerves V (tongue), IX (pharynx) and X (epiglottis) were obtained during surgical interventions. mRNA was extracted from 10 samples and retrotranscribed to cDNA for TRPV1 expression quantification by RT-qPCR. Four samples were marked with TRPV1 and PGP9.5 (neural marker) specific antibodies to produce immunofluorescent preparations visible under a confocal microscope.

Results: Relative expression of TRPV1 was maximal in the tongue (2.583 ± 0.1487) and decreased in the epiglottis $(1.399 \pm 0.1300, p < 0.05)$. We found TRPV1 immunofluorescence in nerve fibres marked with PGP9.5 and basal epithelial cells from all three studied regions.

Discussion: We found that TRPV1 is expressed in all the human oropharyngeal regions we examined, with a higher relative level in the tongue than in the epiglottis. We also found that TRPV1 is expressed in both sensory fibres and epithelial cells from the tongue (V) through the pharynx (IX) to the epiglottis (X). This information will be useful for future pharmacological assays using TRPV1 agonists to treat swallowing disorders.

OP.44

Cricopharyngeal Dysfunction: Balloon Dilatation and Laser Myotomy, A Pilot Study

Arenaz Bua, Beatriz*¹; Olsson, Rolf²; Bülow, Margareta²; Ekberg, Olle²; Westin, Ulla²

¹Skåne University Hospital, Önh Kliniken, Sweden; ²Skåne University Hospital, Sweden

Introduction: Cricopharyngeal dysfunction (CPD) is caused by failed or partial sphincter relaxation, a lack of pharyngoesophageal coordination, or a reduction in the muscular compliance of the upper esophagus sphincter (UES). Typical symptoms are dysphagia, frequent aspiration, and functional narrowing at the level of the UES. It is characteristic a reduction in the maximal opening of the UES during transsphincteric flow. Clinical and radiological assessment of CPD can be challenging: videomanometry combining solid state manometry and videofluoroscopy allows direct comparison of pressure readings with dynamic anatomy.

Materials and Methods: This is a prospective randomized pilot study in order to study the effect of balloon dilatation (BD) and laser myotomy (LM) of the cricopharyngeal muscle (CM), using videomanometry as an objective measure and the Swedish version of Sydney Swallowing Questionnaire (SSQ) to register patient's self-assessment at baseline and 1 and 6 months after treatment. Descriptive statistics and repeated measures ANOVA will be used to analyze data using SPSS version 21.

Results: Ten patients were included, but only 8 completed the study, 4 were treated with BD and 4 with LM. The UES sagital diameter in millimeters increased significantly: pre-operative mean 5.32, CI ((4.09-6.91), 1 month post-operative mean 7.53, CI ((6.54-8.67), and 6 months post-operative mean 8.11, CI ((6.37-10.36), p = 0.017. According to the SSQ score, all patients felt better 1 month after treatment, but after 6 months 50 % of those treated with BL showed a trend to worsen.

Discussion: We will discuss how SSQ score and videomanometry parameters change pre- and post-operatively and how they can help us to choose the right technique for each patient.

OP.45

Preparation of Thickened Drinks: Can Accuracy Be Improved by Using Pre-Thickened Products as a Visual Reference?

Hanson, Ben*1; Cohen, Stephen2; Smith, Christina2

¹University College London, Mechanical Engineering Department, UK; ²University College London, UK

Background: Fluid thickeners are widely used for dysphagia management, however the ability to produce a thickened drink to the required consistency varies significantly. This study investigated whether pre-thickened products—of known consistency—could assist in the preparation of thickened drinks by providing a reference.

Methods: 60 student volunteers produced 200 ml drinks to stages 1, 2 and 3 by mixing starch-based thickener with (i) apple juice (ii) apple juice already pre-thickened to stage 1 (iii) naturally-thick tomato juice. Half the volunteers—Group A—were provided with UK National Descriptors and thickener manufacturer's instructions. Group B were additionally provided with 200 ml pre-thickened oral nutritional supplements in glasses. Performance indicators were measured (quantities of powder and liquid, viscosity, mixing quality) and volunteers completed questionnaires on their experiences.

Results: Despite having identical instructions, the subjects' approaches varied widely in terms of mixing order, measuring quantities, and the duration and vigour of mixing. Thickening apple juice: Group B showed less variability in powder/liquid ratio and viscosity compared to Group A. When the apple juice had already been slightly thickened Group A showed the largest variability of all tests: some "stage 1" results were higher viscosity than some "stage 3". In comparison, Group B's results were closer to the target consistency and much less variable. Similar advantages of Group B were noted when thickening naturally-thick tomato juice.

Conclusions: Written instructions are insufficient to produce repeatable results, especially when a drink is not naturally thin. The provision of a pre-thickened product as a "reference" liquid improved the accuracy of thickening drinks.

OP.46

Rehabilitation for Upper Oesophageal Dysfunction for Adults with Neurological Dysphagia: An Evidence Based Systematic Review

Chiang, Mindy; Walshe, Margaret*

Trinity College Dublin, Ireland

Introduction: Upper oesophageal sphincter (UOS) dysfunction is prevalent in adults with neurological dysphagia, with reported incidence ranging from 5.7–44 %. Treatment options include surgery, pharmacological interventions and rehabilitation techniques. Clinicians have limited direction on the efficacy and effectiveness of these approaches. While a Cochrane systematic review is in progress on

pharmacological interventions, there is little information on other interventions. The aim of this systematic review is to evaluate the evidence on non pharmacological interventions, specifically rehabilitation approaches involving exercise to improve UOS function and dysphagia.

Materials and Methods: Inclusion criteria were all published and unpublished randomized and non randomized studies in all languages on adults who had UOS dysfunction associated with a neurological condition. Electronic databases (PubMed, EMBASE, CINAHL, AMED, Web of Science, Scopus) were searched from inception to April 2013. Grey literature was hand searched. Data was extracted by two independent reviewers and moderated by a third person. Appraisal of quality was completed using the Cochrane risk of bias tool.

Results and Discussion: 306 studies were identified. Only 5 studies met the inclusion criteria. These studies involved four exercise interventions: jaw opening exercise, Shaker exercise, Mendelsohn manoeuvre with sEMG biofeedback, and effortful swallow with electrical stimulation. Overall the methodological quality of the studies was weak. This review highlights the critical lack of evidence supporting exercise interventions for UOS dysfunction. The implications for clinical practice and research are discussed.

OP.47

Does Bolus Volume and Consistency Influence Swallow Physiology During Left and Right Head Rotation? An Automated Impedance Manometry (AIM) Analysis

Scheerens, Charlotte^{*1}; Vermeyen, Bénédicte²; Van Oudenhove, Lukas³; Selleslagh, Margot¹; Dejaeger, Eddy⁴; Goeleven, Ann²; Oustamanolakis, Pantelis³; Tack, Jan³; Omari, Taher⁵; Rommel, Nathalie¹

¹Translational Research Center for Gastrointestinal Disorders and ExpORL Department of Neurosciences, Belgium; ²ExpORL Department of Neurosciences, Belgium; ³Translational Research Center for Gastrointestinal Disorders, Belgium; ⁴Geriatric Medicine, Belgium; ⁵Gastroenterology Unit, Child, Youth & Women's Health Service, Australia

Introduction: Head rotation is a postural change used to prevent aspiration or residue in patients with asymmetric laryngeal or pharyngeal impairment. However, the effect of bolus volume and consistency on swallowing during this postural change is unclear. Hence, we aim to quantify the effect of left and right head turn on pressure flow metrics and the interaction with bolus volume and consistency in healthy subjects.

Materials and Methods: 12 healthy controls (6 M, mean age 32 years, 21–53 years) swallowed 3 consistencies (liquid, semisolid, solid) in 2 volumes (small [5 ml-2 cm²] or large [10 ml-4 cm²]). All swallows were recorded with high resolution manometry-impedance (36P12Z) and analyzed with AIMplot, deriving swallow metrics for pharynx and upper esophageal sphincter (UES). Mixed models were estimated with each AIM metric as dependent variable, and volume, consistency and head posture as within-subject independent variables. Pairwise differences were tested using post-hoc t-tests corrected for multiple comparisons.

Results: Left and right turn showed a significant increase in UES nadir impedance, indicating reduced UES diameter compared to head neutral. Larger volumes elicited significantly higher pharyngeal peak pressures compared to smaller boluses in left and right turn. More

viscous boluses significantly decreased UES nadir impedance, indicating larger UES diameter compared to thin boluses.

Discussion: First, this study shows that swallow metrics during head rotation are affected by bolus volume and consistency in healthy controls. This implies that the therapeutic outcome of head rotation may differ according to the swallowed bolus. Second, our study shows that head rotation impacts on the UES diameter and strength of pharyngeal contraction during deglutition. Interaction effects on AIM parameters Peak Preasure and UES Nadir Impedance.



Poster Presentations PP01–PP83

PP01

Healthcare Workers Involved in the Care of Individuals with Dysphagia in Nursing Homes: Their Perceptions of Dysphagia and Its Management

Galligan, Aileen*1; Leonard, Rachel²

¹National University of Ireland Galway, Áras Moyola; ²Discipline of Speech and Language Therapy, National University of Ireland Galway

Introduction: The incidence of Dysphagia increases with age and prevalence among residents in nursing homes is particularly high. Aspiration pneumonia is recognised as a cause of morbidity and mortality in the elderly population. Yet healthcare workers with frequent patient contact may be limited in their knowledge and training in Dysphagia. Therefore research in this area is required.

Materials and Methods: A questionnaire design was used. Questionnaires were forwarded to participants responsible for the care and feeding of older adults with Dysphagia in nursing homes. The aim was to explore healthcare staffs' perceptions in relation to the identification and management of Dysphagia and assess the need for further education.

Results: 92 % of participants stated that more training was required, while 52 % identified 'lack of knowledge/training' as a factor preventing them from following Speech and Language Therapists' (SLT) guidelines. Findings also highlighted a significant lack of awareness around the role of the SLT in swallowing; when asked who they felt should be responsible for conducting a dysphagia review, 28 % of participants selected a Doctor, 12 % Senior Nursing Staff and 20 % a Dietitian. Time restrictions were also reported as a barrier to compliance with SLT recommendations.

Discussion: There is a need to identify how improvements can be made to ensure those with Dysphagia receive appropriate care and management and those involved in their care receive adequate training and support to deal with the problem effectively. This may be achieved through provision of basic training to healthcare workers.

PP02

Prevalence of Oropharyngeal Dysphagia in Patients with Stable COPD

Gonzalez Lindh, Margareta*1; Koyi, Hirsh2; Fredriksson, Lennart3

¹Logopedmott, Gävle Sjukhus; ²Department of Respiratory Medicine, Gävle Hospital; ³Centre for Research & Development, Uppsala University/City Council of Gävleborg, Gävle, Sweden

Introduction: Prevalence of dysphagia in patients with Chronic Obstructive Pulmonary Disease (COPD) is widely an unknown phenomenon in Sweden. The cause is believed to lie in the intricate coordination of swallowing and breathing. The aim of this study was primarily to test 51 patients with moderate to severe COPD using a timed waterswallow test, a cookieswallow test and a questionnaire to explore the prevalence of oro-pharyngeal dysphagia. Was it possible to determine at what stage of the disease (GOLD) the patient start experiencing symptoms of dysphagia and is there a difference between men and women regarding the amount of dysphagia symptoms.

Materials and Methods: 51 patients with an FEV1 \leq 75 % of predicted were enrolled prospectively. Spearman's rank correlation coefficient was used to identify possible correlations between lung function and signs/symptoms of oro-pharyngeal dysphagia.

Results: 65 % of the patients experienced some sort of subjective swallowing dysfunction when asked; either coughing, choking or bolus retention. 49 % showed signs/symptoms (s/s) of measurable oro-pharyngeal dysphagia in the objective testing. If all data was considered (subjective + objective) 78 % showed some form of swallowing dysfunction (severity not graded). A significant correlation was found between lung function (FEV1 %) and (1) subjective s/s, (2) objective s/s and (3) all s/s of dysphagia. No significant difference was found between men and women in regards to amount of dysphagia symptoms.

Discussion: These results confirm the growing body of evidence from international research suggesting that a subgroup of people with COPD are prone to oropharyngeal dysphagia.

PP03

Apnea-Hypopnea During Water Swallowing in Patients with Amyotrophic Lateral Sclerosis

Nozaki, Sonoko*1; Sugishita, Shuhei2; Saito, Toshio3

¹Hyogo University of Health Sciences; ²Takasago Municipal Hospital; ³Toneyama National Hospital

Introduction: Swallowing difficulty is increased along with progression of respiratory disturbance in patients with Amyotrophic Lateral Sclerosis (ALS). To analyze the respiratory patterns during swallowing is important for the management of this disease. We evaluated the respiratory cycle at rest and after 3 ml water swallowing, and apnea/hypopnea (A/H) during water swallowing.

Materials and Methods: We evaluated respiratory patterns in swallowing in 10 ALS patients (66.0–7.1 yo) and in 10 healthy volunteers as control (61.7–10.0 yo). Respiratory patterns were evaluated by simultaneous recording of cervical swallowing sound in water swallow. A hypersensitive microphone measured cervical sound. A thermistor was used for pneumography. The means of four continuous respiratory cycles at rest and after swallow of water were used for analysis. Respiration with amplitude of 1/2 or smaller than that of the pneumography was defined as A/H.

Results and Discussion: The respiratory cycle was 3.15 ± 0.76 s at rest, and 2.78 ± 0.83 s after swallowing, in the ALS, 3.46 ± 0.57 s at rest and 3.24 ± 0.50 s after swallowing in control. The A/H duration in the ALS (14.33 ± 8.89 s) was significantly longer than that in control (3.64 ± 1.00 s) (p = 0.004 by the t-test). The ALS patients with severe respiratory failure or with aspiration in video-fluoroscopy showed extended A/H duration. We speculate that A/H prolongation is caused by severe swallowing disturbance and respiratory failure in ALS, which increases the risk of aspiration.

PP04

The Performance of Speech and Language Pathologist in Therapy Nutritional Multidisciplinary Team

Ferreira, Thiago*1; Torres, Ana Catarina2; Furkim, Ana Maria3

¹Primavera Hospital, Six Street, N. 105; ²Federal University of Bahia; ³Federal University of Santa Catarina

Introduction: Care with dysphagic patient has stood out among health workers and institutions are more aware about their care, the risk of aspiration and prolonged and recurrent hospitalizations. The Speech and Language Pathologist (SLP) is part of the Therapy Nutritional Multidisciplinary Team (TNMT), in order to optimize this service. The aim of this research is to characterize the performance of the SLP in TNMT.

Materials and Methods: This is a transversal study, conducted with the TNMTs coordinators in four hospitals of two Brazilian cities, using a questionnaire that included the duties of this teams.

Results and Discussion: Of the hospitals surveyed had 67.8 % TNMT. The aspects considered to define the reintroduction of oral diet were: level of consciousness (n = 4), the results of swallowing objective exams (n = 2) and SLP evaluations (n = 2). The SLP evaluations are backed up by evaluation protocols in 100 % of the teams. For the removal of feeding tubes were considered the following factors: percentage of acceptance of oral diet (n = 4), no coughing or choking (n = 2) SLP prognosis (n = 2). Among the professionals involved in this definition the SLP was cited by all teams and was related to the volume of the oral diet offered in 100 % of the responses. From SLP that make up these teams, 60 % are specialists in dysphagia or 'hospital SLP'. The SLP, a member recently inserted therein, assumes role of utmost importance in the conduct of feeding planning of the individual.

PP05

Long Term Follow Up of Severe Dysphagic Patients with Chronic Aspiration: Report of 3 Cases

Woisard, Virginie*1; Da Costa, Magda2

¹Voice and Deglutition Unit ENT Department, Larrey Rangueil University Hospital; ²Anesthesiologia and Critical Care Unit Department

Introduction: The evolution of pulmonary status in patients of chronic aspiration is rarely described.

Materials and Methods: In this presentation, the case of 3 patients living with severe chronic aspirations since more than 7 years is exposed before stopping eating by the mouth. In the 3 cases, a combined

follow up was organized with the swallowing center and the pulmonary department because of the refusal of a non oral feeding.

Results and Discussion: The aetiologies of the swallowing disorders are (1) irradiation for a Hodgkin lymphoma performed in 1978, (2) surgery and radiation therapy for a Head Neck Cancer in 2003, (3) symptomatic Occulopharyngeal myopathy since 2000. The three patients are now feeded by a PEG because of a progressive denutrition. Only the case (3) have some typical pneumonia before the placement of the PEG. The case (1) presented a severe respiratory decompensation as an early complication of the PEG. The case (2) never presented an acute episode. The pulmonary diseases observed by tomodensitometry, fiberendoscopy and functional assessment will be described. A chronic inflammatory pneumonia is a constant disease. Several profiles of decompensation are possible.

PP06

Dysphagia Secondary to the UES Dysfunction Caused by Tracheostomy Presence

Ton, Valeria*; Ciocchini, Claudia; Gonzalez, Dalma; Silahian, Valeria.

C.I.A.R.E.C. Rehabilitation Hospital, Monroe 4770

Introduction: The epidemiological profile of hospitalized patients in rehabilitation has changed. This matter requires speech therapists rethink treatment models in order to board sub-acute patients since their hospitalization. The admission of tracheostomized patient in our facility has increased exponentially. Although endotracheal intubation, ventilator support and tracheostomy are life sustaining procedures during hospitalization, they complicate the normal swallowing physiology. Superior airway isolation by tracheostomy makes swallowing and speech difficult or can even prevent it.

Objectives: To evaluate tracheostomy tube on the UES opening effects and its consequent dysphagia. To describe the physiopathological mechanism that cuff inflated tracheostomy causes on swallowing and respiratory mechanics. To predict if airway instrumentation by a tracheal tube affects UES opening.

Materials and Methods: A prospective study was undertaken in 25 tracheostomized patients in a rehabilitation hospital with two diagnostic categories: neurological disorders and respiratory diseases. Dysfunction of the UES opening and presence of dysphagia were diagnosed by videofluoroscopy study, which was made by deflated cuff and speech valve. **Results:** The appearance of reduced UES opening during swallowing and decrease of hyolaryngeal excursion were observed in 80 % of the study population. This situation causes penetration and/or aspiration due to abundant residues after swallowing on posterior tongue, pharyngeal wall, vallecula and pyriform sinus.

Discussion: A correct therapeutic approach of these patients that recovers impaired muscular function caused by the tracheostomy presence would accelerate the recovery of oral feeding and communication and decrease some procedure to dilate the UES.

PP08

The Use of Endoscopy in the Evaluation of Severity of Dysphagia: Inter-Rater and Intra-Rater Reliability of the P-Score

Farneti, Daniele*¹; Prencipe S., Raffaella²; Fattori, Bruno³; Nacci, Andrea³; Mancini, Valentina³; Genovese, Elisabetta⁴

¹Audioloy Phoniatry Service—"Infermi" Hospital Rimini, Via Settembrini n. 2; ²Audiology Phoniatry Service—Infermi Hospital Rimini; ³ENT Audiology Phoniatry Unit—University of Pisa; ⁴Audiology Service, University of Modena

Introduction: This study evaluates the intra-inter rater reliability of the Pooling score (P-score) in the clinical endoscopic evaluation of severity of swallowing disorder, considering residues in the pharynx and larynx. The score is expressed by a number (ranging from 4 to 11) deriving from the sum of numbers attributed to the site, amount and management of material pooling.

Materials and Methods: Four judges evaluated 30 short films of pharyngeal transit of 10 solid, 11 creamy and 9 liquid boluses in 23 subjects complaining of dysphagia (10 M/13 F, age from 31 to 76 years, mean aged 58.56 years). The films were randomly distributed in 2 CDs: CD0, see at time 0 and after 7 days, and CD1, seen one day after CD0. Prior to scoring the films, the judges had a 30 min session on the explanation and use of the P-score.

Results: The inter-rater and intra-rater reliability was calculated, using the intraclass correlation coefficient ICC (3,k) for items site, amount, management and the P-score total. The coefficient ICC (3,k) was found to be respectively: 0.999, 0.997, 1.00 and 0.999. The analysis of variance showed no statistically significant dependency by the consistency in the differences detected.

Discussion: The study showed a very high correlation among the raters and times of observation. The consistency of the bolus does not affect the outcome of the test, which should, however, be facilitated by the possibility to train judges in its use.

PP09

Psychometric Characteristics of Questionnaires on Functional Health Status in Oropharyngeal Dysphagia: A Systematic Literature Review

Speyer, Renée*1; Kertscher, Berit2; Heijnen, Bas3

¹School of PHTMRS, JCU, Townsville, QLD, Australia & Department of ORL Head and Neck Surg, LUMC; ²Institute of Health, HAN University of Applied Sciences; ³Department of Otorhinolaryngology and Head and Neck Surgery, Leiden University Medical Center

Introduction: In the assessment of oropharyngeal dysphagia in adults, it is common practice to use a symptom list to describe a patient's functional health status (FHS). This systematic review provides an overview of FHS questionnaires and the corresponding psychometric characteristics.

Materials and Methods: A systematic literature search was performed by two independent reviewers using two different electronic databases Pubmed and Embase. All available inclusion dates up to April 2013 were used. Key words (Mesh and Thesaurus terms) were supplemented by using free text words. Only original articles describing FHS questionnaires in oropharyngeal dysphagia were included, thus, excluding for example Health Related Quality of Life questionnaires (HRQoL). Questionnaires that did not provide information on psychometric characteristics as well as lack the necessary information to determine psychometric characteristics were listed but excluded from outcome tables.

Results: Although quite a few FHS questionnaires can be retrieved from the literature, only limited information is available on the psychometric characteristics of FHS questionnaires.

Discussion: Further research is required on determining the psychometric characteristics of FHS questionnaires. The use of FHS questionnaires not showing good validity and/or reliability must be avoided because of their questionable contribution to patients' outcome measurement.

PP10

The Oropress; A New Safe, Valid and Reliable Wireless Tool for Measuring Swallowing and Isometric Pressures

Perry, Alison*¹; Casey, Vincent²; Conway, Richard²; McCormack, Joanne²; Hickey, Catraione²; Ni Chualain, Carmel²; Walshe, Margaret³

¹Head, Department of Clinical Therapies, Faculty of Education and Health Sciences; ²University of Limerick; ³Trinity College Dublin

Introduction: Existing tools for measurement of oral tongue-palatal forces during swallowing have variable, or unknown, psychometric properties and many are not 'fit for purpose' as their stability of measurement is poor. There is a need for accurate baseline measures of such pressures to examine (i) the effect of therapy on changing oral tongue pressures and (ii) the effect of changing such pressures on swallowing function. This presentation describes the design of a new tool, the OroPress, consisting of a small, unobtrusive sensor adhered to the hard palate that links wirelessly to a laptop computer, which may be used to record isometric and swallowing (tongue-palatal) pressures. We present data from pilot studies of norm participants and discuss our planned studies with clinical populations.

Materials and Methods: Thirty five norm participants, purposefully recruited across age and gender, tested the psychometric properties of the OroPress tool (safety, reliability) during both swallowing and isometric tasks. Ten norm participants (SLT students) were separately recruited to test the validity of the OroPress by comparing it with the IOPI during isometric tasks.

Results: The OroPress tool has been shown to be safe, extremely accurate in measurement, and a valid and reliable tool for pressure measurement during both swallowing and isometric conditions in the series of studies with students and norm participants undertaken at UL and at TCD. We will present and discuss the data and their implications. **Discussion:** We have designed a wireless tool for extremely accurate and reliable measurement of oral tongue pressures during both swallowing and isometric tasks. This enables us to have sensitive baseline data and examine the effect of therapy on changing these pressures.

PP11

Swallowing: How Much Larynx Do We Need?

Vith, Ursula*1; Castiglioni, Kristina2; Bohlender, Joerg E.2

¹Department of Phoniatrics and Logopedics, ENT, University Hospital of Zurich, Frauenklinikstr. 24, Switzerland; ²Department of Phoniatrics and Logopedics, ENT, University Hospital of Zurich, Switzerland

Introduction: The voice formation and the capacity to swallow are strongly affected in patients with Cricohyoidopexy (CHP) or Cricohyoidoepiglottopexy (CHEP). Due to changes in anatomy and sensibility of the pharynx and larynx area, there is great danger of aspiration and consequently aspiration pneumonia. In most cases, temporary tracheostomy and a change of diet to enteral nutrition is inevitable.

Method: Individual case studies of 5 patients (4 male and 1 female, aged 43–57).

Results: Relevant factors, such as the number of preserved arytenoid cartilages, age, compliance and general health of a patient significantly affect the outcome of a successful rehabilitation of voice and swallowing.

Discussion: Although anatomic structures present great changes after CHP or CHEP, swallowing free of aspiration and the formation of a strong voice is possible.

PP12

Tongue Pressures, Endurance and Swallowing Pressures as Clinical Indices in Dysphagic Population

Pavlidou, Elena^{*1}; Printza, Athanasia²; Triaridis, Stefanos²; Goutsikas, Charalambos²; Mataxas, Spyros²; Konstantinidis, Jiannis²

¹Aristotle University Thessaloniki, Desperai 22; ²Aristotle University Thessaloniki

Introduction: The aims of this study are (1) to evaluate and analyze the range of the tongue strength and the endurance in patients with various causes of dysphagia, (2) to document the impact of the reduced tongue strength on swallowing function by examining the swallowing pressures and (3) the comparison of all these clinical indices between the disordered groups.

Materials and Methods: Thirty patients with swallowing disorders participated in the study. Ten patients with degenerative neurologic disease, ten post stroke dysphagic patients and ten Head and Neck Cancer patients were included. All clinical measures were obtained using the Iowa Oral Performance Instrument (IOPI). Maximum isometric pressures were evaluated by compressing the air-filled balloon into the palate with the maximum voluntary effort. Additionally dry swallow pressures were recorded. All measures were repeated three times for each subject.

Result: All measured pressures statistically significantly reduced in the dysphagic population. Statistically significant differences were noted between the subgroups for the mid and posterior tongue endurance. Swallowing pressures did not differ significantly between the groups.

Discussion: Lower tongue endurance is the main finding in the dysphagic population. The magnitude of the decrease depends on the specific medical condition. A holistic approach of the oromotor mechanism may provide a better insight into the pathology in terms of swallowing function.

PP13

Clinical Swallowing Evaluation and Its Impact on Quality Indicators in Hospital for Surgical Patients

Castan o Perez, Rube'n Osmar*

Hospital Universitario Austral, Av pte Peron no. 1500

Clinical Swallowing Evaluation and Its Impact on Quality Indicators in Hospital for Surgical Patients Authors: Castano R, Cesario H, Hita A, Pratesi P, Grassi D, Sacco

Introduction: Oropharyngeal dysphagia is a consequence of many acute and chronic diseases, a functional consequence of many a surgery and oncological treatment. This study analyzed the results and impact on quality indicators chosen by a long-term acute care hospital.

Materials and Methods: A professional specialized in swallowing disorders used Clavé's bedside volume-viscosity swallow test (V-VST) in the context of general wards as well as in intensive care and coronary units. This observational retrospective epidemiological study analyses the results of the evaluation of 97 patients aged 18 years old and over, during two successive years. The variables analysed are four: Impaired safety, efficiency, food intake, and dysphagia classification. **Results:** The authors' critique of a systematic revision on aspects such as the lack of studies on a single evaluation and the differentiation of safety and efficiency impairments, given that they determine different comorbidities, was considered to analyse the results. We could observe that dysphagia prevalence in the aforementioned groups was similar to the evidence: the relevant aspect of this study is that there is a direct relation between safety impairments, no oral feeding and mild severe dysphagia. Discussion: This finding enables us to infer that bedside clinical evaluation on different risk groups impacts positively on quality indicators: ratio: antibiotic taken, days on MRA, surgical discharge, in-hospital mortality in cardiovascular surgeries and stroke.

PP14

Improvement of Tongue Strength and Endurance via Lingual Exercises in Patients with Dysphagia

Pavlidou, Elena^{*1}; Printza, Athanasia²; Triaridis, Stefanos²; Kynigou, Maria³; Metaxas, Spyros²; Konstantinidis, Jiannis²

¹Aristotle University Thessaloniki, Desperai 22; ²Aristotle University Thessaloniki; ³Theageneio Hospital

Introduction: It is clinically important to examine tongue function in terms of rehabilitation of swallowing difficulties. The purpose of the study is to evaluate the effects of the lingual exercises in patients with dysphagia by measuring the strength and the endurance of the tongue before and after treatment.

Materials and Methods: This is a prospective cohort intervention study with 4 and 8 weeks follow-ups. Eleven patients with dysphagia (seven neurologic and four Head and Neck Cancer patients) were included in the study. Subjects performed an 8-week isometric lingual exercise program by using the Iowa Oral Performance Instrument (IOPI). Anterior, mid and posterior tongue elevation and endurance were obtained by compressing an air-filled bulb between the tongue and the hard palate. Isometric pressures, endurance and the screening EAT 10 questionnaire were collected at baseline, week 4 and week 8. Results: There was a statistically significant increase in maximum isometric pressures (week 4: P < .003 anterior tongue; week 8: P < .002 anterior tongue and P < .001 posterior tongue) and endurance (week 8: P < .003 anterior tongue; P < .004 posterior tongue). EAT 10 was significantly decreased in all subjects (week 8: P < .001). Discussion: These findings indicate that systematic lingual exercises improve the strength of the tongue and the endurance and enable patients with dysphagia to improve their swallowing ability.

PP15

Late Diagnosis, Success and Failure in Swallowing Rehabilitation Therapy

Castaño Perez, Rubén Osmar*1; Bilbao, Jorge2; Cesario, Hernan2

¹Hospital Universitario Austral, av pte peron No. 1500; ²Hospital Universitario Austral

Introduction: This study purports to evaluate the results of swallowing rehabilitation therapy on tertiary care patients. The variables analyzed were paramount for their association with this study results and for future discussion on the scope of this study.

Materials and Methods: 30 patients aged between 16 and 91 years old were studied. They were subjected to a swallowing and rehabilitation protocol during an average three-month period on tertiary care. Inclusion criteria: Dysphagia patients who did not receive rehabilitation therapy during their acute process or secondary care. The variables analyzed were gender, age, dysphagia topography, and secondary morbidity to previous swallowing disorders and during rehabilitation therapy, associated motor consequences and feeding methods. Direct and indirect rehabilitation maneuvers, proprioceptive maneuvers and cryotherapy were used in the protocol.

Results: Group A: responded to rehabilitation therapy whereas group B showed no response to the latter. The above mentioned response involves no artificial means nutrition and hydration in patients, whereas the absence of response involves the patient's inability to hydrate and nourish orally.

Discussion: A relevant factor in this study is the high percentage of respiratory complications. When patients did not receive rehabilitation during secondary care, out of the total patient population, 10 suffered from 1 respiratory complication and 1 patient suffered from 3 complications. All of them needed antibiotic treatment. It can be concluded that swallowing rehabilitation therapy should take place early for neurogenic dysphagia.

PP16

Effects of the Talk Tools[®] Assessment and Treatment of the Jaw on Feeding Skills in Children with Developmental Feeding and/or Swallowing Disorders

van der Walt, Karin; Jagoe, Caroline; Walshe, Margaret*

Trinity College

Introduction: Oral motor disorders in children with oral-preparatory dysphagia are frequently associated with functional feeding difficulties. While oral motor exercises (OMEs) are routinely used in clinical practice, evidence for their efficacy is lacking. The study aims to explore the effects of the Talk Tools[®] Assessment and Treatment of the Jaw on oral-motor skills that are important for functional feeding on children with oral-preparatory dysphagia (OPD). Additionally, it aims to determine whether parents of children with oral-preparatory dysphagia observe a reduction in the perception of drooling.

Materials and Methods: Seven (N = 7) participants with OPD participated in six-weeks of intervention utilizing the Talk Tools[®] Jaw Program. The Schedule of Oral Motor Assessment (SOMA), Feeding functional Assessment (FFA) and the Drooling Impact Scale (DIS) were used as baseline measures, and re-administered immediately following a 6 week therapy block and at a 4 week post-therapy maintenance point. Participants' caregivers completed a questionnaire on their perception of the Talk Tools[®] Jaw program once therapy had concluded.

Results: A significant improvement for oral-motor skills in response to the Talk Tools[®] Jaw Program was found in the SOMA and FFA. A significant improvement was maintained after a 4 week maintenance period. There were no significant reductions in the impact of drooling. Parental responses on a feeding questionnaire revealed positive perceptions with regards to improvements in feeding and chewing abilities.

Discussion: The findings of this phase 1 study suggest that the Talk Tools[®] Jaw Program is be effective in improving oral motor skills in children with oral-preparatory dysphagia.

PP17

Comparison of the Effect of Pyriform Balloon Swallow in Stroke Patients with Dysphagia Depending on the Lesion Side

Kim, Yong Kyun*¹; Seok, Hyun²; Yoon, Jeong Gyu³

¹Kwandong University College of Medicine, Myongji Hospital,
 697-24 Hwajung, Dukyang; ²Sooncheonhyang University Hospital;
 ³Kwandong University College of Medicine, Myongji Hospital

Introduction: The objective is to compare effects of balloon swallow at pyriform sinus depending on the lesion side in stroke patients with dysphagia.

Materials and Methods: Subjects 16 stroke patients with cricopharyngeal dysfunction in videofluoroscopic swallow study (VFSS) were divided into 2 groups. One are 8, brain lesion on the right, and the other are 8, brain lesion on the left. Intervention The balloon using 16 Fr foley catheter was inserted through the left nostril into the left pyriform sinus. Balloon was positioned on the pharyngo-esophageal segment (PES) under fluoroscopy. The balloon was swallowed into the esophagus. After swallow it was de-ballooned and then relocated on the PES. This was repeated for 5 min. Evaluation The changes of pre and post-balloon swallow in laryngeal elevation, pharyngeal transit time, and pharyngeal remnants of VFSS were compared between two groups.

Results: There was a significant decrement of post-swallow in pharyngeal remnants after balloon swallow in both groups. The remnants after balloon swallow in the group of right hemispheric lesion were less than those in the group of left hemispheric lesion.

Discussion: Balloon swallow at pyriform sinus can be one of the modalities to relieve dysphagic symptom in stroke patients with cricopharyngeal dysfunction. Furthermore, the application of balloon on the contralateral side of pyriform sinus would be more effective for decrease of pharyngeal remnants.

PP18

Health Care Professionals' Perceptions of Dysphagia in the Acute Care Setting

Gallagher, Ailish*1; Leonard, Rachel2

¹National University of Ireland, Galway, Speech and Language Therapy Department; ²Discipline of Speech and Language Therapy, National University of Ireland, Galway

Introduction: Dysphagia is a condition which may lead to negative health consequences. The role of the Speech and Language Therapist (SLT) in the management of Dysphagia is well established. However research shows that a team approach is essential in improving patient outcomes. Compliance with SLT recommendations by members of the multi-disciplinary team is reported to be low thus impinging on the standard of care being provided to those with dysphagia.

Materials and Methods: Anonymous questionnaires were distributed to health care providers working with people with Dysphagia in an acute care setting.

Results: Lack of time and knowledge were identified as the main barriers to compliance with SLT recommendations (46 %). 10 % of

participants stated that they would always 'like to follow guidelines' but time pressures prevented them from doing so. 17 % of participants stated that they felt the patients' quality of life is of greater importance than complying with SLT recommendations and, 33 % reported the patient's refusal to comply with modifications was a factor in non-compliance. 83 % reported that further training and supervision is required for those working with people with dysphagia in the acute care setting.

Discussion: Healthcare providers in the acute care setting have acknowledged that it is not always possible to comply with SLT recommendations. Similar to other studies conducted in the area, lack of knowledge and time were the key risk factors for non-compliance. A need for further training to ensure an adequate standard of care is provided to those with dysphagia was identified.

PP19

Results of Paraesophageal Hernia Repair After 9 Years—An Anatomical Repair is Sufficient!

Wilhelm, Dirk*1; Schirren, Rebecca2; Feussner, Hubertus2

¹Department of Surgery, Klinikum rechts der Isar; ²Klinikum rechts der Isar/TU München

Introduction: Paraesophageal hernia (PEH) should be repaired because of typical symptoms and the risk of severe complications. Controversy persists as to the surgical approach and whether an antireflux procedure and a mesh repair is required. Data of a systematic longterm follow-up after an anatomical repair without mesh and with a fundoplication on demand are analysed.

Materials and Methods: This study reviews the longterm results of 117 patients who underwent surgical repair of large paraesophageal hernia, either via the open, transabdominal or the laparoscopic approach without mesh reinforcement. A fundoplication was only added in case of a manifest reflux disease. Mean follow-up was 9 years. Patients were reviewed by means of a standardized questionnaire and had a thorough diagnostic work-up in case of disease related symptoms.

Results: 20 % of investigated patients showed a sliding hernia in esophagograms, however most of the patients were free of symptoms. True recurrences were observed in 2 patients after conventional open repair and in 2 patients after a laparoscopic procedure. Surgical mortality was 1.7 % over the entire follow-up period. Reoperations were necessary in 12 patients for incisional hernia, for small bowel obstruction in one patient and for the mentioned recurrences in 4 patients. 85 % of patients had an improved symptoms score after PEH repair. A fundoplication had been applied in 12 patients to prevent from reflux.

Discussion: Our data report on the long-term outcome after tailored PEH repair under avoidance of prosthetic material. Given the completely satisfying results, we consider our proceeding with an on-demand anti-refluxive reconstruction and with abandonment on prosthetic material as recommendable for the primary restoration of paraesophage.

PP20

Surgery of Glottis Closure for Treatment to Prevent Aspiration Pneumonia in Adults

Nagai, Miki*; Enomoto, Keisuke; Takeda, Kazuya; Harada, Shotaro; Sakata, Yoshiharu

Osaka General Medical Center

This report describes a surgical procedure for intractable aspiration pneumonia, and is investigated the effect and the invasion of surgery of glottis closure for treatment to prevent aspiration pneumonia. For 2 years, eighteen patients suffering from severe aspiration pneumonia were treated with a glottis closure originally reported by Montgomery in 1975 and modified by Kano et al in Japan in 2007. Eleven patients are progressive neural disease, and four patients are head and neck cancer. Before surgery, all patients need tube feeding, and thirteen patients already with tracheal canula. We assess the effect after surgery by oral feeding and no tracheal cannula necessary and the invasion of surgery by postoperative complication and hospitalization. Nine patients with mild level of independent living of bedridden are often all oral feeding and sometimes no tracheal cannula necessary. Nine patients with severe level of independent living of bedridden are tracheal cannula necessary and tube feeding after surgery. No serious postoperative complications, but postoperative cutaneous fistula with three patients. The mean hospitalization of six patients including five severe bedridden patients who were planned hospitalization could leave our hospital for 12 days. This surgical procedure is minimally invasive and successful in treating mild and severe bedridden patients with progressive neural disease as well as head and neck cancer.

PP21

Correlating Swallowing- and Speech Outcome in Patients with Advanced Head and Neck Cancer Treated with Chemoradiotherapy

Jacobi, Irene^{*1}; van der Molen, Lisette²; van Heemsbergen, Wilma²; Hilgers, Frans²; van den Brekel, Michiel²

¹The Netherlands Cancer Institute, NKI-AvL, Department of Head & Neck Oncology & Surgery; ²The Netherlands Cancer Institute

Introduction: Several structures in the head and neck area have an important role in both swallowing and speech. Previous analyses showed that one year after patients with advanced head and neck cancer finished chemoradiation treatment, articulation precision and strength were decreased. The decreases were significantly related to mean radiation doses to structures such as e.g. the tonsil fossa/soft palate. Here, we analyze whether swallowing- and speech outcome correlate in this patient group, and to what extent correlating measures are related to the same structures.

Materials and Methods: Thirty-four patients with advanced stage (III, IV) squamous cell carcinoma were recorded before, (10 weeks and) one year after chemoradiotherapy. Swallowing data were available for the same assessment points. Articulation data, swallowing outcome, and mean radiation doses to structures in the head and neck area were correlated.

Results: One year after the end of treatment, patients who reported to have no problems in swallowing solid consistencies showed the strongest/k/-plosives whereas those who experienced problems showed weaker plosives. Swallowing and articulation measures both correlated significantly with mean doses to the tonsil fossa/soft palate. In contrast, swallowing fluid consistencies was neither correlated to velar plosive strength, nor to mean radiation doses to the tonsil fossa/soft palate. Work in progress includes further analyses on the relationship of articulation-, voice- and swallowing outcome.

Discussion: Articulation and swallowing outcome that reflect velopharyngeal closure and base of tongue movement were both comparably affected by radiation doses to the tonsil fossa/soft palate.

PP22

Comparison of Swallowing Outcomes After Transoral CO₂ Laser Versus Partial Laryngectomy

Demýr, Numan¹; Serel, Selen^{*1}; Karaduman, Ayse¹; Suslu, Nilda¹; Inal, Ozgu¹; Kucuk, Babur²

¹Hacettepe University, Turkey; ²Ankara University, Turkey

Introduction: We aimed to show the comparison of swallowing outcomes after transoral CO_2 laser surgery (TLS) versus partial laryngectomy (PL).

Materials and Methods: The study included 15 supraglottic larynx cancer patients. The patients were divided into two groups according to surgery type. All patients evaluated with fiberoptic endoscopic swallowing evaluation 10 days and 4 weeks after surgery, the Penetration Aspiration Scale (PAS) was used. The decannulation time, discharge time, oral intake start and nasogastric tube (NG) removal time were noted.

Results: 8 of the patients had PL and 7 of them had TLS. There is no statistically significant difference between two groups in PAS scores (p > 0.05) 10 days and 4 weeks after surgery. The mean decannulation time was 9.13 ± 9.28 days, the mean discharge time was 18.6 ± 6.64 days, the mean oral intake start 18 ± 6.59 days and NG removal time was 28.93 ± 7.79 days in PL. The mean discharge time was 14 ± 3.74 days, the mean oral intake start 13.57 ± 3.36 days and NG removal time was 22.43 ± 3.69 days in TLS. Only one patient of TLS had tracheostomy and the decannulation time was 10 days. There is statistically significant difference between two groups in their decannulation, discharge, oral intake start and NG removal times in favour of TLS group (p < 0.05).

Discussion: TLS is used extensively for its favourable features including an effective cutter penetrating target tissue, sealing off blood vessels with minimal thermal effect and collateral damage. So we think these features may affect the swallowing outcomes better. So we found statistically significant difference between two groups in their decannulation, discharge, oral intake start and NG removal times favour of TLS group If the group numbers is increased, the differences can be shown better.

PP23

How to Develop the Feeding Skills in Patient with Cleft Larynx?

Winnicka, Ewa^{*1}; Dorota, Majak²; Anna, Rybak³; Matuszczyk, MaÅ 'gorzata³; Zych, Kamila³; Socha, Piotr³; Adamczyk, Aleksandra³; Wejnarska, Karolina³

¹Department of Gastroenterology, Hepatology and Eating Disorders, The Childrenâ's Memorial Health Institute, Academy of Special Ed, Poland; ²Department of Radiology, The Childrenâ's Memorial Health Institute, Poland; ³Department of Gastroenterology, Hepatology and Eating Disorders, The Childrenâ's Memorial Health Institute, Poland

Our aim was to present the effects and methods used during the development and the therapy of feeding skills. A 2.5 years boy, born with a cleft larynx and subglottic stenosis of the larynx, trachea flaccidity and other defects, was qualified for surgery of the larynx by-step. The patient came under our care at the time when he was after his first surgery and prior to the final reconstruction. Patient choked after all kinds of foods and food appeared in tracheostomy. The final reconstruction of tracheostomy could not be done due to dysphagia. The feeding team (gastroenterologist, speech therapist, nutritionist, psychologist, radiologist) was involved during whole feeding therapy. We began the diagnostic approach with the Videofluoroscopic Swallow Study (VFSS) which showed a large proportion of food in the tracheostomy tube as a result of the leaking food penetration from the outside into the tube. It turned out that the boy was not properly fed by his parents, what resulted in a lack of control over the food in the mouth. The diagnosis of feeding team showed feeding disorders in addition to dysphagia. Optimal care of the feeding team resulted in the eager food consumption without choking. The food was sucked out of the tube occasionally and in very small quantities. Although in significantly lower amounts, food was occasionally aspirated form tracheostomy tube, so it was decided to perform second VFSS. The test suggested a shunt in surgical area and it was decided to perform a computed tomography of the neck. In the presented case report we stress the role of individual specialists in the diagnostic and therapeutical approach in patient with dysphagia and feeding disorders on the basis of the cleft larynx.

PP24

Dysphagia and Aspiration After Chemoradiation— How to Manage?

Denk-Linnert, Doris-Maria; Roesner, Imme*; Leonhard, Matthias

Medical University of Vienna, Department of Otorhinolaryngology, Austria

Chemoradiation, an organ-preserving treatment modality in head and neck cancer patients, often has a debilitating effect on swallowing function, even years after therapy. Acute and long-term dysphagia and aspiration are often underestimated sequelae. They do not only bring about potentially life-threatening complications due to pulmonary consequences (aspiration pneumonia) or malnutrition but also have a negative impact on quality of life. The prevalence data vary widely. Tube feeding is necessary in a great number of treated patients-even during 5 years follow-up (13-25 %, Bourhis et al. 2011). For the diagnostic workup, instrumental diagnostic evaluation of swallowing function with FEES(ST) [fiberoptic (flexible) evaluation of swallowing (with sensory testing)] and/or videofluoroscopic swallowing study are indispensable to reveal the pathophysiology of dysphagia and to establish a therapy regimen. In addition, subjective rating scales should be used to describe the impaired quality of life. Functional swallowing therapy comprises individually tailored causal, compensatory and adaptive treatment modalities and should start as early as possible. Early therapy onset seems to be a positive prognostic factor of therapeutic success. In case of insufficient oral nutrition, non-oral feeding (PEG) has to be provided. Until now, no possible prevention strategies (dose and protocols of radiation, structures to be spared) have been defined. Therefore, prospective clinical trials are necessary for further research. Case studies will demonstrate the diagnostic and therapeutic management challenges.

PP25

COMT Gene Polymorphisms are Associated with Symptoms of Dysphagia in an Elderly Population

Nimmons, Danielle*¹; Pendleton, Neil¹; Payton, Tony¹; Wilkinson, Jack²; Hamdy, Shaheen¹

¹University of Manchester, UK; ²Research and Development Department, Salford Royal Hospital, UK

Introduction: Polymorphisms of the enzyme Catechol-O-Methyl Transferase (COMT) have been associated with age related degeneration and brain plasticity. We hypothesized, given the link with dopamine and brain function, interactions between polymorphisms of the COMT gene would predict dysphagia symptoms in an elderly population.

Materials and Methods: 800 members of a genetically well characterized community dwelling elderly cohort received the Sydney oro-pharyngeal dysphagia questionnaire via mail. A score of 180 or more was indicative of significant dysphagia. Saliva samples were assessed for COMT polymorphism carrier status. Logistic regression analyses were performed to investigate whether any of the polymorphisms under consideration were predictive of dysphagia after adjusting for age and gender, in addition to interaction effects between polymorphisms.

Results: 638 subjects (80 %) returned the questionnaire. Saliva samples were available for analysis in 540 of these subjects with 82 (15 %) having significant dysphagia (scores \geq 180). COMT polymorphisms rs165599 and rs10835211 were found to be associated with dysphagia symptoms with a significant interaction between the two (p = 0.018, OR = 0.21, CI = 0.06–0.77). The effect of each of these two polymorphisms varied according to the carrier status of the other. In the case of rs10835211, the effect of heterozygosity was protective or harmful dependent on the respective status of rs165599, with rs165599 homozygosity producing a >400 % increased risk of dysphagia.

Discussion: We have found a novel relationship between self-reported symptoms of dysphagia and COMT status of polymorphisms rs165599 and rs10835211. These results demonstrate the importance of genetic factors in age related problems, such as dysphagia.

PP26

Correlation Between Neuropsychological Disorders and Dysphagia in Patients with Cognitive Disorders

Giattini, Alberto*¹; Capriotti, Marco²; Caiazzo, Annarita²; Morsut, Franceso²; Cocci Grifoni, Silvia²

¹Ist. S. Stefano, Via dei Girasoli, 6, Italy; ²Ist. S. Stefano, Italy

Introduction: Dementias can generate complications such as pneumonia and dysphagia which are common causes of death. A complete assessment of swallowing functions can determine a rehabilitation treatment and prevent aspirations. The aim of this study is to demonstrate a correlation between cognitive impairment and swallowing disorders, directed towards the prevention of connected complications in patients with cognitive disorders.

Materials and Methods: In a rehabilitation division 18 patients, with postsurgical orthopedic diagnosis, were assessed. They did not have cerebrovascular, neoplastic, demyelinating or extrapyramidal diseases. The Dysphagia Outcome and Severity Scale (DOSS), and Mini Mental Status Examination (MMSE), have been used as screening. Then patients were assessed with neuropsychological tests. To assess swallowing abilities MISA6 Scale was used as well as a Fiberoptic Endoscopic Examination of Swallowing (FEES). A control group with normal swallowing symptoms underwent the same examinations. Scores of cognitive tests were compared with subscales of MISA, using the Spearman's Rank Correlation Coefficient.

Results: We saw a correlation between the apraxic abilities and solid/ liquid ingestion/management. Positioning had a strong correlation with attentive abilities. We didn't find a strong correlations between memory and ingestion abilities. Data obtained from healthy subjects showed an abnormality in the study group. **Discussion:** The correlations obtained provide us with important prognosis information of swallowing disorders in patients with cognitive impairment. Langmore, in her study, demonstrated a strong correlation between swallowing disorders and frontotemporal dementia. In clinical practice this one of the most worrying factor.

PP27

Levodopa and Swallowing Impairments in Parkinson's Disease (PD) Revisited

Michou, Emilia*¹; Harris, Lou²; Rothwell, John³; Hamdy, Shaheen¹

¹The University of Manchester, UK; ²The University of Manchester, UK; ³UCL, UK

Dysphagia in PD patients, affects nutritional and drug intake and reduces quality-of-life. Here, we investigate the possible neurophysiological mechanisms contributing to dysphagia in PD when 'on' and 'off' Levodopa with transcranial magnetic stimulation (TMS). 26 verified PD patients (65 \pm 9 yoa, 10 male) were reviewed with dysphagia severity questionnaires and Swal-QOL. After 12 h 'off' L-dopa, patients underwent cortical TMS mapping of pharyngeal musculature, craniobulbar TMS stimulation, and videofluoroscopy (VFS), and all were repeated following L-dopa re-intake. Factorial and non-parametric statistical tests were applied. 11 patients reported swallowing disturbances and their Swallowing QOL score was reduced. However, VFS identified swallowing impairments both 'on' and 'off' Levodopa in 10 patients (SI), while 6 patients showed impairments only 'On L-dopa' (SIon), with the remainder 10 subjects showing no impairments (NSI). Aspiration-penetration scores worsened on L-Dopa (P < .05) for SIon. In Levodopa-replete state, both SIon and NSI had significantly different pharyngeal cortical excitability compared to SI. Brainstem reflexes for the patients in the SIon group were significantly different to NSI group only 'off' medication. For SIon group, there was a significant decrease in craniobulbar excitability compared to off-state. Different patterns of cortical and brainstem activity, reflecting different mechanisms of compensation with L-dopa, can differentiate dysphagic PD groups. Physiology was negatively affected by L-dopa in groups presenting concurrent inhibition of brainstem reflexes. Our novel brain stimulation data demonstrate the dysphagia in PD patients is associated with altered cortical and brainstem activity; a platform for research on rehabilitation in PD.

PP28

Usefulness of Water Swallow Test (WST) in a Stroke Unit

Villatoro, Montse; Romeral, Gemma*

Parc de Salut Mar, Spain

Introduction: Dysphagia affects up to 27–50 % of stroke patients. Swallowing disorders complications can lead to malnutrition, bronchoaspirative pneumonia and increase mortality, and has an impact on health care costs. Objectives To determine the incidence of dysphagia in a Stroke Unit and the usefulness of Water Swallow test (WST) in detecting aspiration in the acute phase.

Materials and Methods: Retrospective study of stroke patients sample (n = 530) who were attended from January 2012 to December 2012 in a Stroke Unit of Tertiary University Public Hospital. Water Swallow test (WST) were performed in all patients in order to detect

swallowing disorders. Demographic variables, WST results and respiratory complications have been evaluated.

Results: The final sample was of 117 patients (57 men, 60 women; mean age 73.02 years, SD 14.26 years) WST was only performed in the 43 % of patients, from these patients 78.4 % presented swallowing disorders. Respiratory complications was present in 50 % of evaluated patients and death rate was 13.4 %.

Conclusions: Results give us update information about the low rates of screening tests applied to detect the dysphagia. The high incidence of health complications in swallowing disorders makes it necessary to apply any type of screening tool. As a result, it is necessary to improve our skills in detect dysphagia in a Stroke Unit in order to prevent the consequences.

PP29

Swallowing Evaluation in Patients with Laryngeal Dystonia Before and After Treatment with Botulinum Toxin

Dantas, Roberto*1; Alves, Leda2; Ricz, Hilton2

¹Medical School of Ribeirão Preto—University of São Paulo, Av Bandeirantes 3900—Campus da USP, Brazil; ²Medical School of Ribeirão Preto—University of São Paulo, Brazil

Introduction: Dystonia is a syndrome consisting of involuntary muscle contractions. A form of focal disease is laryngeal dystonia, causing a tense voice quality and discontinuous speech during the involuntary closing of the vocal folds during phonation. The treatment can be carried out with the injection of botulinum toxin in the muscle groups affected. The aim of this study was to evaluate swallowing in patients with laryngeal dystonia before and after treatment with botulinum toxin.

Materials and Methods: We evaluated 17 patients with ages between 23–88 years (mean: 61 years), diagnosed with laryngeal dystonia, before and after 22–40 days (mean: 33 days) treatment with the injection, guided by electromyography, of botulinum toxin type A in the thyroarytenoid muscle, and 20 healthy subjects, ages between 32–83 years (mean: 63 years) as controls. Videofluoroscopy evaluation was performed with three 5 ml swallows of liquid barium and three 5 ml swallows of paste barium prepared with liquid barium with food thickener. The sequence of swallows was random.

Results: After the injection of botulinum toxin in the patients, there was no difference in oral and pharyngeal bolus transit duration compared with the evaluation before the injection. The patients had pharyngeal transit faster than the controls, for liquid and paste boluses.

Discussion: Injection of botulinum toxin into the thyroarytenoid muscle for the treatment of vocal disorders caused by laryngeal dystonia did not change the oral and pharyngeal transit duration about 30 days after the injection. Patients with laryngeal dystonia showed faster pharyngeal transit than controls.

PP30

Videofluoroscopic Findings on Swallowing Exam, Impaired Nutritional Status and Quality of Life in Stroke Patients

Pacheco, Aline; Dantas, Roberto*; Miranda, Rúbia; Silveira, Rafaela; Pontes-Neto, Octávio

Emergency Unit of the Hospital of School of Medicine at Ribeirão Preto-USP, Brazil

Introduction: Oropharyngeal dysphagia is common in stroke patients, occurring in 45–65 % of cases. We aimed to characterize the most frequent videofluoroscopic findings on swallowing exam in stroke patients; identify impaired nutritional status and quality of life in this population and to analyze the possible factors associated with these complications.

Materials and Methods: We studied 30 stroke patients admitted to the Emergency Unit of the Hospital of School of Medicine at Ribeirão Preto—USP between August 2011 and January 2012, about 30 days after the ictus. Stroke was evaluated by neuroimaging and clinically by neurological scales. Swallowing was assessed by videofluoroscopy. Nutritional status and quality of life were assessed, respectively, by the instrument MNA[®] and SWAL-QOL questionnaire.

Results: We found high frequency of complaints related to swallow among our patients. Disorders in the oral phase of swallowing were associated with lesions in the left hemisphere, whereas disorders in the pharyngeal phase with lesions in the right hemisphere. Most of our patients had impaired nutritional status, and this was associated with cognitive impairment, depression, functional disability in the univariate analysis. Impaired nutritional status was independently associated with scores on the NIHSS and pharyngeal residues on multivariate logistic regression. The studied subjects also had worse quality of life when compared to healthy elderly individuals. The presence of aspiration and malnutrition was associated with a worse score in the fatigue domain.

Discussion: Stroke patients had high prevalence of swallowing disorders, nutritional loss and impaired quality of life. Studies are required to evaluate the impact of these complications in the patients prognosis.

PP31

Variability in Oral and Pharyngeal Transit Between Paired Swallows in Chagas' Disease

Dantas, Roberto*¹; Santos, Carla²; Cassiani, Rachel²; Nascimento, Weslania²

¹Medical School of Ribeirão Preto—University of São Paulo, Av Bandeirantes 3900—Campus da USP, Brazil; ²Medical School of Ribeirão Preto—University of São Paulo, Brazil

Introduction: Chagas' disease causes lower esophageal sphincter achalasia, dysphagia, regurgitation and retention of food in the esophageal body. The patients have longer pharyngeal clearance, which might be consequent of the involvement of central nervous system (CNS) or an adaptation to the esophageal transit impairment. If there is CNS involvement, we expect a larger difference in the duration of oral and pharyngeal phases of swallowing between paired swallows than that seen in healthy subjects. The objective of this investigation was to compare the variation of oral and pharyngeal transit durations between paired swallows in patients with Chagas' disease and healthy subjects.

Materials and Methods: By videofluoroscopy, the duration of oral and pharyngeal transit, pharyngeal clearance, upper esophageal sphincter transit, hyoid movement and oropharyngeal transit was measured in 17 patients with Chagas' disease and 15 healthy volunteers. Each subject swallowed in duplicate 5 and 10 mL of liquid barium and 5 and 10 mL of paste barium boluses. The differences between the two swallows were calculated.

Results: There were no differences between healthy subjects and patients in the values of variation of the paired swallows, excepted

for the hyoid movement duration of the 5 mL liquid bolus, which causes a higher variation in healthy subjects than in patients. **Discussion:** Oral and pharyngeal transit variation between paired swallows is similar in patients with Chagas' disease and healthy subjects, which suggests that the longer pharyngeal clearance duration

jects, which suggests that the longer pharyngeal clearance duration previously described is not a consequence of impairment of CNS control of swallowing.

PP32

Clinical Implications of Lived Experience and Adaptation to Reduced Abilities to Swallowing and Eating Following Acquired Brain Injury

Kjaersgaard, Annette*¹; Kaae Kristensen, Hanne²; Borg, Tove³

¹Hammel Neurorehabilitation and Research Centre, Denmark; ²The Clinical Institute, University of Southern Denmark and Odense University Hospital, Denmark; ³Hammel Neurorehabilitation and Research Centre, Hammel, Denmark, Denmark

Purpose: The aim of this study is to explore and interpret how persons with acquired brain injury (ABI) experience and adapt to reduced abilities to swallowing and eating—and clinical implications. **Method:** Explorative multiple-case study with qualitative interviews of six persons following ABI and is a part of a larger randomised controlled trial. A constant comparative method was adopted for data analysis. The lived experience of difficulties in swallowing and eating were investigated and the processes of change were understood as processes of adaptation.

Results: Five main themes emerge from the analysis: individual psychological assets, swallowing and ingestion, eating and drinking, communication and meals, rehabilitation of swallowing and eating. Three predominating sub-themes were: feeding by tube, difficulties in swallowing and meals with social interactions, and inpatient rehabilitation approach concerning swallowing and eating.

Conclusions: This study implies that living with difficulties in swallowing and eating following ABI varies depending on the different phases of the illness trajectory. The reduced or lost ability to swallow and eat, even temporarily, is unexpected, difficult and arouse strong emotional reactions even 18 months after the injury. Findings also show new knowledge of clinical interest as it is possible to adapt and develop new structures for valued activities related to swallowing and eating.

PP33

Relationship Between Maximum Tongue Pressure and Swallowing Function in ALS Patients

Yoshikawa, Mineka*¹; Hesaka, Aya¹; Takaki, Sachiko²; Nakamori, Masahiro¹; Nagasaki, Toshikazu³; Hosomi, Naohisa³; Tsuga, Kazuhiro¹; Tanimoto, Keiji¹; Matsumoto, Masayasu¹; Izumi, Yuishin²

¹Hiroshima University, Japan; ²Bihara Hananosato Hospital, Japan; ³Hiroshima University, Japan

Introduction: Low-impact, simple and high validity swallowing examination is desired to consider the food morphology/tube feeding with deterioration of swallowing function at regular intervals in ALS patients. Tongue pressure measurement can be one of the examinations to satisfy these requests. However, few reports indicated the relationship

between tongue pressure and swallowing function in ALS. Characteristics of dysphagia and significance of tongue pressure measurement are considered through inquiring the relationship among ALS condition/ progression, swallowing function, and maximum tongue pressure.

Materials and Methods: Ten ALS patients (4 male, 6 female, mean age 60.9 years) were evaluated by using ALS functional scale (ALSFRS-R), VF and tongue pressure measurement. Residues in oral and pharynx, aspiration, penetration, lip closure etc. at 5 g paste swallowing in VF were estimated, and maximum tongue pressure (MTP) was also measured (TPM-01TM, Hiroshima, Japan).

Results: Patients were divided into the levels of 48-40 points (n = 2), 39–30 points (n = 7), and < 19 points (n = 1) in ALSFRS-R. No aspiration and penetration was found. Difficulty of bolus holding with lip closure failure (n = 2), poor bolus formation with tongue movement disorder (n = 3), and poor coordination of tongue thrust (n = 4) were found. Mean value of MTP was 20.8 ± 13.4 kPa, and the correlation between ALSFRS-R points of bulbar symptoms and MTP was indicated (r = 0.88, P < 0.01). A significantly lower MTP was found in patients with lip closure failure (P < 0.01), and MTP in the patients with poor coordination of tongue thrust indicated lower value than the one in patients with normal tongue thrust (P < 0.01). And lower MTP in the patients with much oral residue was shown compared to the patients with small oral residue (P < 0.01). Swallowing function at pharyngeal stage was still maintained even at the relatively advanced level of ALS, and this might indicate the deterioration of oral function is main in ALS. Tongue pressure measurement might be useful to evaluate the oral function in ALS.

PP34

Correlation Between Oral and Pharyngeal Problems in Adult Neuromuscular Patients

Demýr, Numan¹; Karaduman, Ayse¹; Serel, Selen^{*1}; Inal, Ozgu²

¹Hacettepe University, Turkey; ²TSK Rehabilitation and Care Center, Turkey

Introduction: The aim was to determine the correlation between oral and pharyngeal problems in adult neuromuscular patients who admitted with swallowing disorders.

Materials and Methods: Swallowing ability and function evaluation (SAFE) was used for oral phase evaluation. Videofluoroscopic swallowing evaluation (VFSE) was done and the Penetration Aspiration Scale (PAS) was used to determine the severity of pharyngeal problems.

Results: 31 patients with the mean age of 58.32 ± 12.74 years, mean height of 164.26 ± 9.65 cm and mean weight of 60.88 ± 15.5 kg were admitted. 51.6 % of patients were Amyotrophic Lateral Sclerosis, 22.6 % of patients were motor neuron patients, 16.1 % of patients were Myasthenia Gravis and 9.7 % of patients were myopathic patients. The mean SAFE oral phase score was 2.5 ± 0.5 . The mean PAS score was 5.9 ± 2.9 . But there is no statistically significant correlation between oral phase and pharyngeal phase problems (p > 0.05).

Discussion: Swallowing is a function and all phases affect each other. So phases should not separated from each other. But our study show that evaluation one phase of swallowing is not enough to predict the exact problem of the other phases. Therefore we should support clinical swallowing evaluation with instrumental evaluation.

PP35

Neurogenic Dysphagia (ND): Paraneoplastic Phenomenon

Avdyunina, Irina*; Selivanov, Vladimir; Chernikova, Lyudmila; Pavlov, Eduard; Seliverstova, Evgenia; Vuytsik, Nataliya

Research Center of Neurology, RAMS, Russian Federation

Introduction: This report presents an analysis of three different dysphagia cases during rarely diagnosed condition of neurologic paraneoplastic syndrome.

Materials and Methods: ND occurred in the setting of thymoma; thyroid tumor or multiple myeloma. Clinical bedside examination and videofluoroscopic swallow study (VFSS) were used. MRI of the brain and electroneuromyography afford us an opportunity to specify defect nature and location.

Results: Evident aspiration in all patients caused pulmonary complications and necessity of artificial alimentation. Severity of ND as a dominant neurological disturbance determined patients' state severity. In all cases there were signs of respiratory failure. "Disturbance of upper airways patency" ND syndrome triggered by apparent tongue and pharynx hypertonia (associated with normal peripheral muscle tone) was observed in the thymoma patient. Movement of a fiberoptic endoscope through the close-ended pharynx constrictors was hindered and caused soreness. Thymoma resection led to swallowing and respiration recovery. Pulmonary and nutritional complications of ND in patient with thyroid tumor turned out to be lethal. VFSS in patient with multiple myeloma showed severe disturbances of oral phase, considerable delay of swallow initiation, pharynx constrictors weakness, cricopharyngeal achalasia with regurgitation and aspiration.

Discussion: Complicated central genesis swallowing disturbances combined with peripheral neurologic derangements (with clinical, roentgenologic, electrophysiological or MRI differences from classical cases) showed the need to rule out the paraneoplastic lesion of the nervous system. The severity of cancer-associated ND as a result of diversified oropharyngeal dysfunction deteriorates patient condition.

PP36

Nature, Risk and Prevalence of Feeding and Swallowing Difficulties in Preterm Infants

Wicke, Kristin*; Senekki-Florent, Panayiota; Walshe, Margaret

Trinity College Dublin, Ireland

Introduction: Feeding and swallowing difficulties are a recognised complication in preterm infants with significant consequences for key stakeholders. The epidemiology of these difficulties is not established. With increased chances of survival for preterm infants, clinicians working in paediatric settings must be aware of the incidence, prevalence, and risk factors for these difficulties. It is important to identify high risk preterm infants early and commence intervention promptly to reduce complications and length of hospital stay. This evidence based systematic review aims to (1) describe the nature of feeding and swallowing difficulties in preterm infants, (2) identify associated risk factors, (3) determine the frequency of feeding problems.

Materials and Methods: Published and unpublished reports were sought in all languages. Eight electronic databases were searched from inception to April 2013. Conference proceedings of five relevant organisations were hand searched. Two authors decided on eligibility. All authors extracted data and assessed methodological quality of reports.

Results: The search yielded 2740 titles. Screening identified 33 potentially relevant articles with six eligible for inclusion. One article was retrieved on prevalence. A wide range of feeding and swallowing problems were reported. Methodological quality was varied. Overall risk of bias was moderate. Difficulties occurred in all stages of swallowing. Main risk factor was low gestational age. Prevalence ranged from 15 to 21 %.

Discussion: This review provides important information for clinicians. Directions for research are provided.

PP37

Screening Method to Evaluate Pharyngeal Swallowing Phase in Patients with Tracheotomy

Ortiz, Catalina*; Ezquerra, Raquel; Pinillos, Sergio*; Guitierrez, Alejandra; Varea, Vicente

Hospital San Joan de Déu, Spain

Introduction: One of the complications that can be present the patient with tracheostomy are aspiratives processes, potential aspect to their worsening respiratory status, manifested by respiratory super infection negatively affecting the quality of life and prolonging hospitalization. To determine food content in airway through the stoma waste is very complex as it may be confused with secretions, by presenting similar colorations. From the service of Gastroenterology, Hepatology and Nutrition of the San Joan de Deu Hospital we present a screening method that allows us by staining, to determine with an effective and noninvasive way the presence of aspirative processes during intake.

Materials and Methods: For intake by age we use bottles, spoon, glass etc as different textures as nectar, liquid, pudding, honey and solid with blue dye staining food coloring, gluten and lactose-free. After ingestion we proceed to aspirate and then collected with the sample that will be positive if colored.

Results: Were enrolled 12 patients between 3 months and 14 years. 40 % of cases were positive for aspiration in pharyngeal phase and the remaining 60 % negative. For the group that tested positive, a video fluoroscopy was done agreeing in a 100 % with the study result. **Discussion:** This screening method allows us with high reliability to assess the pharyngeal phase, making it a simple and noninvasive method to determine aspirative processes.

PP38

Postoperative Dysphagia After Anterior Cervical Spine Surgery

Fix, Constanze*¹; Drumm, Jörg²; Wilmskötter, Janina³; Pitzen, Tobias²; Duchac, Stefanie³; Schumann, Beate³; Stanschus, Sönke³

¹Department of Speech Therapy, SRH Hospital Karlsbad, Karlsbad, Germany, Guttmannstraße 1, 76307 Karlsbad, Germany, Germany; ²ZWOT Center for Spinal Surgery, Orthopaedics, Traumatology, Department of Spine Surgery, SRH Hospital Karlsbad, Karlsbad, German, Germany; ³Department of Speech Therapy, SRH Hospital Karlsbad, Karlsbad, Germany, Germany **Introduction:** Up to 79 % of patients suffer from dysphagia following anterior cervical spine surgery (ACSS). This pilot study investigates factors associated with post-operative dysphagia.

Materials and Methods: Patient parameters (sex, smoking-status, cervical-operation level, number of surgeries and operated segments) were collected from 19 patients (10 women, mean age 58, range 44–72). Pre versus post-surgical videofluoroscopic (VF) analyses were conducted using penetration-aspiration score (PAS) and oral and pharyngeal residue for 4 boluses per video (tsp thin liquid, sip thin liquid, paste, solids). Pre-VF was conducted the day before surgery and post-VF within 4.53 days (average). Wilcoxon Rank-Sum test compared pre- and post-surgical VF findings by texture and volume and McNemar's test compared post-operative VF findings by demographic groups.

Results: PAS: Statistical analysis revealed no significant differences for pre versus post-surgical PAS scores regardless of texture or volume. Residue: More residue was only observed for post-surgical vallecular residue with teaspoon liquid (p = .034) and solids (p = .018).

Patient parameters: More than one surgery (p = .036) was associated with greater postoperative residues in piriform sinus for thin liquids by tsp. Furthermore, smokers demonstrated more postoperative vallecular residue with solids (p = .049). Moreover, patients with a surgery on >1 cervical segment showed more penetration of liquids (PAS > 1) (p = .017), although PAS scores were largely within functional levels.

Discussion: This pilot sample of ACSS patients demonstrated increased residue post-surgery. Smoking-status, multiple surgeries and surgical segments appear to increase symptoms of dysphagia. These data provide support for future hypothesis-guided study design.

PP39

To Investigate the Incidence and Nature of Oropharyngeal Dysphagia Post Oesophagectomy

Mulgrew, Caoimhe*1; Daly, Ceire2

¹Speech & Language Therapy Department, St. James's Hospital, Ireland; ²Speech & Language Therapy Department, St. James's Hospital, Ireland

Introduction: St. James's Hospital performs 65-70 % of the total number of oesophagectomies nationally including 2 stage, 3 stage and transhiatal procedures. These patients are routinely seen Day 4 postop for swallow assessment by the SLT department due to the high incidence of respiratory complications in this population. There is limited research on the characteristics of dysphagia seen in this population. The aim of this study was to build a profile of this cohort by quantifying the presence and features of oropharyngeal dysphagia in patients who have undergone 2 stage, 3 stage and transhiatal oesophagectomy, and to investigate if there was correlation with our findings and those of the literature.

Materials and Methods: 40 patient charts were analysed retrospectively over an 18 month period using an audit questionnaire capturing specific information relating to oropharyngeal dysphagia. Data was collated and coded using Microsoft Excel.

Results: 50 % of the sampled population presented with oropharyngeal dysphagia requiring diet/fluids modification and/or use of compensatory strategies in order to tolerate oral intake safely. Dysphagia was equally present across the three types of surgery. 75 % of the dysphagic symptoms had resolved within a 20 day period which is in keeping with the literature (Heitmiller and Jones 1991). 18 % also presented with dysphonia. **Discussion:** This study revealed that although a significant proportion of patients presented with initial swallow difficulties, upon discharge these had predominantly resolved. Therefore, this population exhibit good potential for recovery. Findings also support the notion of reduced hyolaryngeal elevation in this population. This study has facilitated a more in depth understanding of dysphagia after oesophagectomy.

PP40

Symptoms of Anxiety and Depression Assessed with the Hospital Anxiety and Depression Scale in Patients with Oropharyngeal Dysphagia

Verdonschot, Rob*¹; Baijens, Laura¹; Serroyen, Jan²; Leue, Carsten³; Kremer, Bernd¹

¹Department of Otorhinolaryngology, Head and Neck Surgery, Maastricht University Medical Center, The Netherlands; ²Department of Methodology and Statistics, Maastricht University, The Netherlands; ³Departments of Psychiatry and Neuropsychology, Maastricht University Medical Center, Maastricht, The Netherlands

Introduction: A prospective study on symptoms of anxiety and depression (affective symptoms) in patients with oropharyngeal dysphagia was carried out. The aim of this study was to determine the presence and severity of symptoms of anxiety and depression in these patients.

Materials and Methods: Symptoms of anxiety and depression were prospectively assessed in 96 patients, visiting the outpatient clinic for dysphagia using the Hospital Anxiety and Depression Scale. In addition, all patients underwent a standardized examination protocol used for regular healthcare in the outpatient setting for dysphagia including: an otorhinolaryngological examination, a logopedic observation of oral intake, fiber optic endoscopic evaluation of swallowing, videofluoroscopy of swallowing, the Functional Oral Intake Scale, a dysphagia severity scale, and the M.D. Anderson Dysphagia Inventory. Depending on the presence/absence of symptoms of anxiety and depression, several groups were distinguished. Descriptive statistics, Mann–Whitney U tests, and logistic regression models were used.

Results: Clinically relevant symptoms of anxiety were observed in 37 % (N = 34) and clinically relevant symptoms of depression in 32.6 % (N = 31) of the present patient population, with 21.3 % having symptoms of both anxiety and depression. In total 47.3 % (N = 43) of this patient population showed affective symptoms.

Discussion: Given that psychological burden can enhance somatic complaints, the high number of patients suffering from affective symptoms is a relevant clinical outcome in dysphagic patients. The contribution of anxiety or depression to the development or worsening of oropharyngeal dysphagia and their role in interdisciplinary treatment strategy is warranting further research.

PP41

Nonnutritive Swallowing Disorder in Obstructive Sleep Apnea Syndrome

Ouahchi, Yacine*1; Mokaddem, Salma1; Beji, Majed1; Verin, Eric2

¹Pneumology Department, La Rabta Hospital, Tunisia; ²Experimental Surgery Laboratory, France

either during the night or in the morning. Our aim was to assess the significance of this symptom in OSA. **Materials and Methods:** 40 patients (age >17 years) with OSA diagnosed by respiratory polygraphy [Apnea Hypopnea Index (AHI) \geq 5] were questioned to determine if a nocturnal dry mouth and a difficulty to swallow saliva were present. We determined the frequency of dry mouth in all patients and the frequency of difficult nonnutritive swallowing in patients with dry mouth. We determined also the frequency of severe OSA (AHI > 30) respectively in patients

Introduction: Swallowing disorders in obstructive sleep apnea

(OSA) syndrome are known to be asymptomatic. However, we

observed that some patients with suspected OSA report a difficulty to

only dry mouth and patients without these symptoms. **Results:** Dry mouth was present in 80 % of patients with OSA. It was associated with difficult nonnutritive swallowing in 74 % of cases. Severe OSA was present respectively in 67 % of patients with dry mouth and difficult nonnutritive swallowing, 53 % of patients with only dry mouth and 50 % of the rest of patients.

with dry mouth and difficult nonnutritive swallowing, patients with

Discussion: The difficulty to swallow saliva is often associated with dry mouth. It may be the consequence of a severe dry throat and a mechanical trauma of the pharyngeal tissues during sleep. This sign seems to be a characteristic symptom suggesting often a severe OSA.

PP42

Esophageal Manifestations in Systemic Sclerosis with Pulmonary Arterial Hypertension: About 20 Cases

El Euch, Mounira¹; Ouahchi, Yacine^{*2}; Lamloum, Mounir¹; Ben Ghorbel, Imed¹; Ben Salem, Thouraya¹; Hamzaoui, Amira¹; Khanfir, Monia¹; Houman, Habib¹

¹Internal Medicine Department (La Rabta Hospital), Tunisia; ²Pneumology Department (La Rabta Hospital), Tunisia

Introduction: The esophagus is the most common localization of systemic sclerosis (SS). If not diagnosed at an early stage, resulting complications may include esophagitis and increased risk of interstitial lung disease.

Patients and Methods: This is a retrospective study conducted in our department about 20 patients hospitalized between 2000 and 2012 with esophageal achievement of SS complicated with pulmonary arterial hypertension. We used esophageal manometry (EM) and high digestive fibroscopy (HDF) to explore the esophageal manifestations.

Results: Our patients were 50.7 years old on average [29–70] with a clear female predominance (1 man and 19 women). Esophageal symptoms present at diagnosis of SS were low dysphagia to solids (13 cases), heartburn (8 cases) and gastro esophageal reflux (3 cases). The EM showed a decrease of esophageal motility and the lower esophageal sphincter tone (10 cases). The HDF was normal (3 cases) and showed an esophagitis (2 cases) or Barett's esophagus (2 cases). The therapy was based on proton pump inhibitors, immunosuppressive drugs and Bosentan (1 case). The evolution was stabilized (19 cases) or aggravated (1 patient died in a context of heart failure).

Discussion: Esophageal involvement remain very common and early appear in SS. EM is the most sensitive test for accurate diagnosis of motor dysfunction. Appropriate treatment mainly proton pump inhibitors ameliorate symptoms and prevents complications.

PP43

Coordination of Breathing and Swallowing in Rats with Pulmonary Fibrosis

Ghannouchi, Inès¹; Marie, Jean Paul²; Verin, Eric*²

¹Hopital Farhat Hached/University of Rouen, Tunisia; ²University of Rouen, France

Introduction: Temporal coordination of swallowing and ventilation is essential to preventing pulmonary aspiration. In healthy individuals, breathing is interrupted during swallowing and resumes in the expiratory phase. The ventilatory dysfunction can alter the swallowing function as well as the coordination of swallowing and ventilation. Patients with COPD or pulmonary fibrosis can be susceptible to changes in the coordination of swallowing due to impaired lung function. The aim of this study was to study the swallowing function as well as the coordination swallowing—ventilation in unrestrained rat with pulmonary fibrosis.

Methods: The study was carried out on 20 male Sprague-Dawley rats subdivided in 2 groups (G1: Healthy control, G2: model of pulmonary fibrosis induced by Bleomycine), using whole-body plethysmography and video recordings.

Results: At rest, in G2, a decrease of expiratory time (TE) and total respiratory time (TTOT) was observed when compared to G1. The mean inspiratory flow (VT/TI) didn't increase significantly in G2 when compared to G1 at rest. However during drinking, TE and VT/TI increased significantly in Fibrosis group. Swallowing frequency didn't significantly change but the % of inspiratory swallowing (I-I) increased significantly when compared to G1.

Discussion: Pulmonary fibrosis probably alter the deglutition and increase swallowing dysfunction and aspiration.

PP44

Videofluorographic Study of Velar Velocity During Speech and Swallowing

Nohara, Kanji*1; Takai, Etsuko2; Ueda, Nami2; Sakai, Takayoshi2

¹Osaka University Dental Hospital, 1–8, Yamada-oka, Japan; ²Osaka University Dental Hospital, Japan

Introduction: The velopharynx closes in swallowing and pneumatic activities. Pneumatic closure, which is acquired, prevents expiratory air from passing into the nasal cavity, whereas during swallowing, velopharyngeal closure is achieved innately, preventing regurgitation into the nasal cavity. These findings suggest that velopharyngeal closure during swallowing is operated by a different mechanism from that during speech. The purpose of this study was to clarify the maximum velocity differences of the velum during swallowing and speech using videofluorography.

Materials and Methods: Eight normal adults served as subjects. Radiopaque markers were glued to the velar fleshpoint at the midline of the depression on the elevated soft palate. Subjects were instructed to product/bampa/five times at a speed of once every two seconds and swallow saliva five times, and then the activities of the velum were recorded by videofluorography from a lateral view. The marker positions were measured frame by frame and the maximum velar elevation velocity during swallowing (V-sw) and speech (V-sp) was calculated using video analysis software (DIPPMotion PRO by Ditect Co.).

Results: In all subjects, V-sw was significantly smaller than V-sp. The average of V-sw of all subjects was 25.4 ± 7.1 mm/s, and that of V-sp was 72.0 ± 16.0 mm/s.

Discussion: These results suggested that movement of the velum in swallowing is operated by a different mechanism from that of speech.

The results of this study propose the necessity of distinguishing velopharyngeal closure during swallowing from that during speech.

PP45

Snack Eating and Respiration in Healthy Adult Humans

Nagasaki, Toshikazu^{*1}; Oota, Kiyohito²; Minamitani, Satsuki²; Konishi, Masaru³; Yasuhara, Yukimi⁴; Yoshikawa, Mineka⁵; Ogawa, Tetsuji⁶; Tanimoto, Keiji²

 ¹Hiroshima University/Department of Oral and Maxillofacial Radiology, 1-2-3 Kasumi, Japan; ²Hiroshima University/Department of Oral and Maxillofacial Radiology, Japan; ³Hiroshima University Hospital/Department of Oral and Maxillofacial Radiology, Japan; ⁴Hiroshima University Hospital/Speech Clinic, Japan; ⁵Hiroshima University/Department of Advanced Prosthodontics, Japan; ⁶Hiroshima University/Department of Advanced General Dentistry, Japan

Introduction: Normal spontaneous swallowing occurs during the expiratory phase, but co-ordination of breathing and mastication is not known. We reveal whether mastication affects the swallowing apnea. Materials and Methods: After Endoscopic Teaching 2012' for dentists and dental students, we obtained informed consent from 51 (26 female and 25 male; aged 22-33, Ave. 26.4 years) to give permission to analyze their data. The Examination System used was Endoscopic System (VF12, PENTAX, Tokyo, Japan), Respiratory Monitoring System (Polymate II, TEAC, Tokyo, Japan) using accordion belts on upper chest and belly, and A Digital Video (Ivis HFM31, Canon Co, Tokyo, Japan) for recording jaw and neck movement of the swallowing. Their data were synchronized and integrated into one video field. We observed, swallowing by endoscopic image, respiration by the thorax movement, and mastication by jaw movement. We analyzed the phase of breathing in the first swallowing during a piece of BiscoTM (4.5 g of snack; sandwich creams between two biscuits) mastication. We also compared the pattern of breathing during the mastication before the first swallowing, and non-mastication period.

Result and Discussion: 38 of the 51 first swallowing apnea during mastication, occurred during the inspiratory phase. The breathing pattern during mastication was not change in 14, depressed in 35, others in 2, in comparison with normal breathing pattern during non-mastication. The first swallowing apnea during the inspiratory phase occurred 8 in 14 no change group, 29 in 35 depressed group, and 1 in 2 other group. These results suggest that the breathing phase of the swallowing may be affected by mastication.

PP46

Chronic Obstructive Pulmonary Disease and Swallowing Disorders

Soria, Franciele^{*1}; Furkim, Ana Maria²; Silveira, Fabiane Rodrigues²; Wolff, Aline³

¹Faculdade Assis Gurgacz, Rua das Papoulas, 70, Brazil; ²UFSC, Brazil; ³USP, Brazil

Introduction: In Chronic Obstructive Pulmonary Disease, there is the chronic obstruction or limitation of the air flow, presenting slow and irreversible progression. For patients with COPD, the coordination

between breathing and swallowing is more affected, as the tracheal breathing episodes resulting from swallowing disorders may lead to the exacerbation of the disease. This way, patients with COPD may present swallowing disorders known as oropharyngeal dysphagia.

Methodology: Research carried out in a University Hospital, based on data from medical files of patients handled there. From the files, data were collected regarding age, gender, base diagnosis, disease time, previous treatments, comorbidities, changes in the respiratory pattern and swallowing alterations.

Results: Files from 20 patients were analyzed. The prevalent diagnosis was COPD (13), followed by Pulmonary Emphysema (4), Chronic Bronchitis (3). Among the most commonly found comorbidities are HAS, 100 %, followed by ICC, 55 % and DM, 45 %. 90 % presented smoking habits, 20 % drinking. 35 % used O_2 at home. 45 % presented some sort of dietary modification and 4 patients used an alternative way for feeding.

Discussion: It seems that the alterations in respiratory patterns of COPD patients may result in swallowing disorders, which may yield to malnutrition, dehydration, pulmonary complications and death. Knowing the factors that may result in worsening the clinical condition of COPD allows the professionals to adopt preventive and protective measures regarding patient health, preventing COPD aspiration and decompensation episodes and reducing the hospital costs due to the handling of the disease.

PP47

Outcome Prediction of Botulinum Toxin Treatment for Difficulty of Relaxation in the Upper Esophageal Sphincter

Park, Jin-Woo*

Dongguk University Ilsan Hospital, 27 Dongguk-ro, Ilsandong-gu, Korea, Republic of Korea

Introduction: Nasal backflow is closely associated with the difficulty of relaxation in the upper esophageal sphincter (UES). However, when the selected patients showing nasal backflow were treated using botulinum toxin, the outcome was not always favorable. Therefore, we tried to find another factor affecting the outcome and hypothesized that pharyngeal constriction could be another factor.

Materials and Methods: We retrospectively reviewed eleven patients who showed nasal backflow and pharyngeal stasis in videofluoroscopic swallowing study and who were also treated using botulinum toxin between Jan. 2011 and Dec. 2012. They were divided into two groups according to their outcomes (G: good or B: bad). Pharyngeal strength was measured using the pharyngeal constriction ratio (PCR), which was compared between the two groups using Mann–Whitney U test. If there was a significant difference between the two groups, we tried to find the cut-off value of PCR to predict the favorable outcome using receiver operation characteristic (ROC) curve.

Results: Only five patients showed esophageal passage regardless of aspiration after botulinum toxin injection. The mean PCR of group G was 0.09 ± 0.03 which was significant different from that of group B (0.29 ± 0.16) (p < 0.05). ROC curve showed that the sensitivity and specificity was 100 and 80 % respectively when the cut-off value of PCR was 0.11.

Discussion: Pharyngeal constriction has revealed to be an important factor that affects the outcome after botulinum toxin treatment for difficulty of relaxation in UES. If we carefully select patients using both nasal backflow and PCR, we can predict good results from botulinum toxin treatment. This method might be very useful when the credible manometric data is not available.

PP48

Identification of Risk Groups for Oropharyngeal Dysphagia in Patients Hospitalized in a University Hospital

Soria, Franciele*¹; Furkim, Ana Maria²; Bassi, Daiane²; Lins, Mariana de Toledo²

¹Faculdade Assis Gurgacz, Rua das Papoulas, 70, Brazil; ²UFSC, Brazil

Introduction: The complications caused by oropharyngeal dysphagia in hospitalized patients increase hospitalization time, the risk of infections, as well as hospitalization costs.

Methods: The study was exploratory and transversal with quantitative and statistical analysis of the results. The population was formed by 32 patients hospitalized in the UH of UFSC. Historical patient data were collected and a swallowing sorting with functional assessment of feeding and nutritional status was performed.

Results and Discussion: Forty-one percent of the patients participating in the research presented a risk factor for oropharyngeal dysphagia, and seventy-five percent presented nutritional impairment. Patients hospitalized with respiratory diseases, Chronic Obstructive Pulmonary Disease (COPD), Congestive Heart Failure (CHF) and patients with xerostomia presented statistically high chances of presenting oropharyngeal dysphagia. Patients with pulmonary impairment presented lack of coordination between swallowing and breathing. Respiratory difficulty is one of the most common CHF symptoms. This may explain the findings in oropharyngeal dysphagia among these three groups. One of the main functions of the saliva is the humidification of the oral cavity and the bolus. With xerostomia, the patients may present difficulty in preparing the bolus, oral phase of swallowing. Coughing, respiratory discomfort and dyspnea are the main symptoms of COPD and bronchoaspiration. These common symptoms limit the safe assessment of swallowing, as they may "mask" the cough trigger (COPD or bronchoaspiration). Studies with instrumental assessments are mandatory in order to move on with this discussion.

PP49

Pulse Oximetry and Bronchoaspiration

Soria, Franciele*¹; Furkim, Ana Maria²; Silva, Francine Lucia²; Silveria, Fabiane Rodrigues²; Wolff, Aline³

¹Faculdade Assis Gurgacz, Rua das Papoulas, 70, Brazil; ²UFSC, Brazil; ³USP, Brazil

Introduction: The dysphagia is a symptom of a base disease and which may bring clinical complications. Aspiration is defined as the inhalation of oropharyngeal or gastric content to the larynx and lower respiratory tract. For detecting the aspiration, methods that make it possible to better view the oropharyngeal swallowing function are used, such as videofluoroscopy, associated to a method like pulse oximetry.

Methodology: The study was performed in the Hospital of the Federal University of Santa Catarina on 12 patients with medical indication for videofluoroscopy and monitoring of pulse oximetry concomitant. The oximeter repose values of the patient in the beginning of the examination and at each detected aspiration. When a drop greater than 2 % was observed in the consistent oxygen saturation, it was considered that was capable of detecting bronchoaspiration.

Results: Four patients presented a drop greater than 2 % in the oxygen levels; only one presented aspiration consistent with the moment of

saturation drop, one presented interferences in the saturation levels related to nail enamel. The detectability index of bronchoaspiration from pulse oximetry was not statistically significant.

Discussion: The change in the oxygen saturation levels may be associated to other factors besides aspiration, such as the causes of low perfusion, vascular diseases, anemia, among others. The oximeter is an important instrument in the assessment from the hospital bed, giving more safety to the therapist on the general clinical state of the patient, not necessarily to only infer aspiration.

PP50

ICU Patients: An Early Dysphagia Screening on Intubated and Ventilated Patients

Delhalle, Sabrina*; Busch, Justine

CHU Liege, Belgium

Introduction: Tracheal intubation is known to provide local lesions and physiological modifications on the swallowing mechanisms. The aim of our study was to develop an easy, reliable and reproductible bedside tool to assess swallowing disorders in intubated patients.

Materials and Methods: A randomized controlled study on two groups of ten patients, similar in age and intubation duration, with no dysphagia history, intubated for minimum 48 h, has been conducted in several intensive care units of our hospital. The control group was tested in the usual way before extubation. In the experimental group, upper aero digestive tract was assessed by an additional 10 items test, just before extubation, 24, 48 and 72 h after extubation. The 10 items are based on evaluation of drooling, pharyngeal noise, cheek tonicity, labial and lingual mobility, head position, mandibular movements, vagal nerve sensitivity, and swallowing.

Results: 60 % of the experimental group patients showed swallowing disorders. After results analysis, we've pointed out that the most reliable items on the dysphagia screening on intubated ICU patients are drooling, mandibular hypomobility, absence of swallowing, tongue base retraction, and labial hypomobility. We could also notice that this 10 items tool shows statically significance until 48 h after extubation, later, there is no difference with the control group.

Discussion: In order to shorten the hospitalization and to minimize the re-intubation risk, we've proposed to develop a screening tool, short (less than 5 min), easy to use by several healthcare professionals. It seems to be acceptable to assess this 10 items tool before and 24 h after every extubation, to detect and prevent the swallowing disorders in this frail patient population.

PP51

The Oropress: A Pilot Study to Examine the Tool's Properties of Measurement and Use as a Biofeedback Tool for Isometric Tasks

McCormack, Joanne*1; Casey, Vincent²; Conway, Richard²; Perry, Alison²

¹University of Limerick, Castletroy, Ireland; ²University of Limerick, Ireland

Introduction: Swallowing is a trait which can be affected by variables such as tongue strength and endurance/stamina, and by biofeedback (feedback through senses). Such variables have been examined by measuring isometric (pushing against resistance) tongue

strength (ITS) and endurance (ITE). The impact of biofeedback on swallowing has also been examined but not its effect on isometric tongue pressure (ITP).

Aims: To examine the psychometric properties of a wireless tool the OroPress when used to measure (i) ITS and (ii) ITE pressures and (iii) to assess its effectiveness as a biofeedback tool.

Method: 35 normal healthy adults (17 males; 18 females) across two age groups, 18–38 years (n = 21) and >38 years (n = 13), were recruited. ITPs were obtained with and without biofeedback, using the OroPress. The effect of age and gender on ITP was examined for face validity; the correlation between two methods of extracting data was examined for construct validity and the effects of biofeedback on ITP were inspected.

Results: Data are reported on 34 subjects-(16 males; 18 females). Males had significantly higher ITS pressures than females (P < .05) but there was no effect for age. Neither age nor gender affected ITE pressures. Large positive correlations (P < .0005) were found between two data extraction methods, and ITS pressure increased significantly with biofeedback (P < .005) but there was a non-significant effect for ITE pressure.

Conclusion: The OroPress demonstrated validity for measuring ITPs. Excellent validity was found for data extraction. As a biofeedback tool, the OroPress significantly increased ITS pressure but had a non-significant effect on ITE pressure.

PP52

The Sensitivity and Specificity of EAT-10 for Dysphagia and Malnutrition in Japanese Elderly with Dysphagia or Suspected Dysphagia

Wakabayashi, Hidetaka*

Yokohama City University Medical Center, 4-57 Urafune-chou, Minami Ward, Japan

Introduction: 10-item Eating Assessment Tool (EAT-10) is a selfadministered swallowing screening tool and score 3 or above means having swallowing problems. The purpose is to assess the validity of EAT-10 in Japanese elderly.

Methods: A cross-sectional study was performed in 393 elderly aged 65 years and older with dysphagia or suspected dysphagia. Severity of dysphagia was assessed by Dysphagia Severity Scale (DSS). Nutrition status was evaluated by Mini Nutritional Assessment Short Form (MNA-SF). The sensitivity and specificity of EAT-10 for dysphagia and malnutrition were assessed.

Results: There were 130 men, 263 women. Mean age was 83.3 years. Median Barthel Index was 30 (5, 65) points. A total of 237 patients (60 %) could respond EAT-10. Based on DSS, 82 were normal swallowing function, 139 were dysphagia without aspiration, and 172 were dysphagia with aspiration. MNA-SF revealed that 174 elderly were malnourished, 175 were at risk for malnutrition, and 40 had a normal nutritional status. Elderly who could not respond EAT-10 were likely to have dysphagia and malnutrition. The sensitivity and specificity of not responding EAT-10 for dysphagia were 0.489, 0.951, for dysphagia with aspiration were 0.640, 0.792, and for malnutrition were 0.868, 0.995, respectively. Median EAT-10 score of 230 respondents was 1 (0, 9), and 101 respondents were more than 3. The sensitivity and specificity of EAT-10 score 3 or above for dysphagia were 0.522, 0.897, for dysphagia with aspiration were 0.758, 0.749, and for malnutrition were 0.652, 0.598, respectively.

Conclusion: EAT-10 is a useful swallowing screening tool for Japanese elderly.

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PP53

Relationship Between Hyoid Movement and Swallowing Function During Voluntary Swallowing in Dysphagic Patients

Magara, Jin^{*1}; Hayashi, Hirokazu¹; Kanda, Chika¹; Hori, Kazuhiro¹; Taniguchi, Hiroshige¹; Ono, Kazuhiro²; Inoue, Makoto¹

¹Division of Dysphagia Rehabilitation, Niigata University Graduate School of Medical and Dental Sciences, Japan; ²Division of Oral Science for Health Promotion, Niigata University Graduate School of Medical and Dental Sciences, Japan

This study was designed to validate the difference in swallowing behaviors between healthy volunteers and dysphagic patients by comparing hyoid excursion and bolus transport spatially and temporally. Sixty-five dysphagic patients and 20 normal volunteers (10 young and 10 elderly adults) were examined by videofluoroscopic (VF) swallowing. Subjects were instructed to swallow test foods, and lateral VF images of oral and pharyngeal areas were acquired to record displacement of the hyoid and food bolus. The origin of the hyoid position was defined as the anterior ridge of the fourth cervical vertebra. Patients were further classified into subgroups on the basis of their primary diseases. The oral and pharyngeal transit times of the bolus were longer in the patient than in the control group, as was the time between entry of the bolus head into the pharynx and the start of pharyngeal swallowing (rapid elevation of the hyoid). Pharyngeal transit time also differed significantly between young and elderly healthy volunteers. Although the basic pattern of hyoid movements during pharyngeal swallowing did not differ in the patient and control groups, movements before pharyngeal swallowing were more complicated in the patient group. In some disease groups, there was a correlation between the distance and duration of hyoid movement before the onset of pharyngeal swallowing. In the patient group, swallowing-related hyoid movement was significantly correlated with bolus transport, a correlation that may eventually cause critical problems, including pharyngeal residues and/or penetration/aspiration, in dysphagic patients. Aging may also affect hyoid movement.

PP54

Reference Standard Tools for Evaluating New Tongue Pressure Instruments: Issues and Challenges

Seehaus, Swenja*; Wicke, Kristin; Walshe, Margaret

Trinity College Dublin, Ireland

Introduction: Much clinical time is spent working on tongue strength and endurance to ultimately improve swallow function. However, research is hampered by the lack of a robust tool to measure these parameters. The OroPress wireless tool (University of Limerick, Ireland) has been developed to address these limitations. New tools must be tested against a current reference or 'gold' standard. The IOPI was selected as the reference standard since recent evidence suggests that the IOPI is a valid and reliable tool (Adams et al. 2013). The aim of this study was to validate the OroPress using the IOPI as the chosen reference standard. **Materials and Methods:** Isometric tongue pressure was collected from 11 healthy women (18–27 years) using the OroPress and the IOPI following the standard protocol for the IOPI (Luschei 2011). To examine the concurrent validity of the OroPress, pressure measures from both devices were correlated. To compare comfort of both devices', participants rated both on a Likert scale. **Results:** No statistically significant correlation was found between measures obtained with the OroPress and the IOPI. Measures from the OroPress were higher for all isometric pressure tasks. Participants reported problems with placement of the IOPI bulb and difficulty maintaining its position in the anterior oral cavity.

Discussion: The IOPI is not suitable as a reference standard in this instance. The next phase of the study will compare the OroPress to the fixed position three sensor tongue array from the Kay Pentax[®] Swallowing Signals Lab.

PP55

Normal Values for Sydney Swallow Questionnaire (SSQ)

Szczesniak, Michal*1; Cook, Ian2

¹Department of Gastroenterology and Hepatology, St George Hospital, Gray St, Australia; ²Department of Gastroenterology and Hepatology, St George Hospital, Australia

Introduction: Sydney Swallow Questionnaire (SSQ) is a validated 17 question (scale range 0–1700), self-report inventory measuring the symptomatic severity of oral-pharyngeal dysphagia. The SSQ was developed to provide a measure of severity that is sensitive to alteration. It showed strong test-retest reliability as well as face, content and constructs validity. Up to date no normative ranges have been established for the questionnaire and the aim of the current study was to derive upper limit of normal for the SSO.

Materials and Methods: An upper limit of normal for the Sydney Swallow Questionnaire (SSQ) was established by collecting responses from 73 (45 males, 28 females, mean age 58.6 years, range 22.0–82.1) patient controls without any history of swallowing problems (e.g., Parkinson's, motor neuron disease, myopathies, stroke, upper GI or head and neck surgery, oesophageal motility disorders, tumours, head/neck/chest radiotherapy). Upper limit of normal reference interval for SSQ was calculated using robust method (Horn 1998) using Reference Value Advisor software after Box-Cox transformation of raw data to normality.

Results: SSQ was administered to 73 healthy participants. No statistically significant relationship between SSQ scores and either age (r[73] = 0.140, p = 0.239) or gender (r[73] = 0.021, p = 0.857) was found. The mean total SSQ score from responders was 59.0 (SD = 56.7), and the calculated upper limit of reference interval was 234 with 90 % CI of [193,277].

Discussion: The upper limit of normal for the SSQ should prove valuable when assessing prevalence or incidence of dysphagia in communities or various patient populations.

PP56

Cerebral Activation During Swallowing in Healthy Individuals: A Brief Review

Guedes, Renata L. V.*¹; Pinto, Aline G. L.¹; Nascimento, Weslania Viviane²; Kowalski, Luiz Paulo¹; Carrara-de Angelis, Elisabete¹

¹AC Camargo Cancer Center, Brazil; ²Medical School of Ribeirao Preto-USP, Brazil

Introduction: Swallowing involves neuromuscular activation, sensoriomotor integration and sensorial stimulus. Changes in its integration leads to dysphagia. The knowledge of cerebral functions

and neuroplasticity involved in swallowing can help develop better rehabilitation programs for patients with dysphagia.

Methods: We reviewed the scientific literature on cerebral activation and swallowing in healthy individuals within three international databases. We included studies with cortex activation description during a swallowing task published on the last 10 years.

Results: Twenty prospective articles were included. Mean age ranged between 18 and 89 years. Nine studies correlated swallowing with different stimulus (visual, auditory and tongue tapping) and 11 with gustatory, electrical and magnetics stimulus, maneuvers and finger tapping. Swallowing involved saliva, water, barium and liquids associated with different flavors. The cerebral activation areas observed with functional resonance magnetic image (fMRI) were the frontal gyrus, supplementary motor area, parietal lobe, cerebellum, insula, precentral and postcentral gyrus and sensoriomotor cortex.

Discussion: There is a great variability on the studies included on this review and inclusion of low number of subjects (maximum number of study participants was 20). fMRI protocols vary and can lead to intersubject interpretation variability. Considering the participants age, with the same variability, is also important as physiologic changes in oropharyngeal swallowing begin to manifest in individuals over 60 years old.

Conclusion: Knowing the neural circuits involved in healthy swallowing can lead to the development of specific rehabilitation protocols based on neuroplasticity and not only on anatomic function.

PP57

Combined Laryngopexy—Cricopharyngeal Myotomy: An Other Way to Manage Intractable Aspiration

Desuter, Gauthier*¹; Boucquey, Donatienne²; Allouch, Johan³; Chantrain, Gilbert³

¹Universite Catholique de Louvain, Service ORL Voice and Swallowing Clinic, Belgium; ²Universite Catholique de Louvain, Belgium; ³Universite Libre de Bruxelles, Belgium

Introduction: Intractable Aspiration (IA) is a life-threatening condition due to advanced oropharyngeal dysphagia. Several invasive procedures have been proposed to secure airways while allowing oral feeding. Unfortunately, these procedures impedes voicing.

Materials and Methods: We present three IA cases treated by combined laryngopexy and CP myotomy (CLM). All patients presented a Rosenbec score of 7 and above at videofluorography and an history of at least 2 aspiration pneumonia within the last year. The CLM procedure consists in the fixation of the thyroid cartilage to the mandibula associated with a section of the crico-pharyngeal muscle. Airways protection and upper esophageal sphincter opening is achieved by fixing the larynx in a permanent swallowing position.

Results: Patient A and C are alive, respectively, 8.5 and 1.9 years after the procedure. Patient B deceased of a non related cause 12 days after surgery. All patients maintained their voice after the procedure. Both patients A and C did not experience any further aspiration pneumonia to date. Patient A had an exclusive oral feeding for 7 years. The subsequent discovery of an oropharyngeal cancer justified a complementary enteral feeding and an arrest of professional activities. Patient C always experiences a mixed, oral and enteral, feeding.

Discussion: Larynx closure, laryngotracheal separation, total laryngectomy and LT-mold stenting[©] are procedures that secure airways at the expense of voicing capacities. CLM represents a different approach of securing the airways of IA patients, favoring voice and allowing some swallowing.

Conclusion: CLM alternative should be proposed to IA patients according to their outcome preferences.

PP58

On the Effect of Saliva on the Rheology of Oral Nutritional Supplements for Dysphagic Patients

Gallegos, Crispulo*¹; Yuliestyan, Avido²; Assegehegn, Getachew²; Staudinger-Prevost, Nadege²; Salinas, M.³; Vicente, W.³; Brito-de la Fuente, Edmundo²; Ascanio, Gabriel⁴

 ¹Fresenius Kabi Deutschland GmbH, Daimlerstrasse 22, Germany;
 ²Fresenius Kabi Deutschland GmbH, Germany;
 ³Instituto de Ingeniería, Universidad Nacional Autónoma de México, Mexico;
 ⁴Centro de Ciencias Aplicadas y Desarrollo Tecnológico, Universidad Nacional Autónoma de México, Mexico

Introduction: Oral nutritional supplements (ONS) are dietary food for special medical purposes indicated for the management of patients with existing malnutrition or at risk of malnutrition. As the ONS bolus gets in touch with saliva in the oral cavity, its rheology is modified before entering the pharynx. The effect of α -amylase addition to two commercial ONS has been rheologically analysed and the flow of the bolus through the pharynx numerically modelled.

Materials and Methods: Two proprietary formulations (Fresubin[®] thickened stages 1 and 2) were characterized in terms of viscous flow behaviour. Small amounts of α -amylase (according to previously reported protocols) were added to the ONS samples in an ad-hoc rheometry tool and the evolution of torque with the elapsed mixing time was monitored until a constant value was obtained. The viscous flow behaviour of the bolus was then characterised and used for modelling the flow of the bolus through the pharynx.

Results: Both formulations show shear-thinning viscous flow behaviour before and after α -amylase addition, although a clear tendency to reach a high-shear-rate-limiting viscosity is always noticed. Sisko's model fits the results obtained fairly well. The α -amylase addition significantly increases the flow index, yielding a larger influence on the ONS consistency at low shear rates. In regard to the flow modelling, neither reflux nor bigger vortices were noticed after the addition of α -amylase.

Discussion: The α -amylase addition to the ONS used in this study does not modify the initial consistency class of the product. Likewise, no qualitative influence from a hydrodynamic standpoint is noticed. Consequently, both formulations can be considered as safe supplements for dysphagic patients.

PP59

Does Increased Swallowing Rehabilitation Practice Improve Outcomes: A Report of Dosage and Outcomes in a Metropolitan Stroke Unit

Vickers, Kathryn*¹; Togher, Leanne¹; Mathisen, Bernice²; Power, Emma¹

¹The University of Sydney, Australia; ²La Trobe Rural Health School, Australia

In swallowing rehabilitation post stroke, few studies have described the dosage of practice of indirect exercises that can be completed in clinical rehabilitation sessions. This study aims to: describe the dosage of swallowing rehabilitation practice participants were able to complete and document swallowing outcomes achieved. A descriptive feasibility study was conducted in a metropolitan comprehensive stroke unit. Twenty participants with persisting dysphagia underwent

an instrumental assessment before being prescribed individualized evidence based swallowing rehabilitation programs of indirect interventional exercises (e.g. Shaker exercise). Throughout the program each participant's total dosage (i.e. number of repetitions) of exercises was recorded. Participants' pre and post-treatment outcome measures included the Mann Assessment of Swallowing Ability (MASA) and the Functional Oral Intake Scale (FOIS). Overall, following a comprehensive swallowing rehabilitation program, there was a significant improvement (p < .01) in the MASA scores from moderate to nil dysphagia (148 vs. 179). Participants also showed a significant progression (p < .01) in their recommended diets on the FOIS (3.5 vs. 5.3). Total dosage of swallowing rehabilitation practice achieved $(\mu = 3091, \text{ range } 363-10.704)$ and number of therapy days $(\mu = 17, \mu)$ range 4-52) was variable. Further analysis was conducted investigating trends and associations between variables. Dosage of swallowing rehabilitation practice and outcomes will vary across stroke survivors. Preliminary results suggest that rehabilitation of persisting dysphagia in the sub-acute phase of stroke may facilitate faster recovery. However, further investigation of the specific factors of practice that facilitate recovery is required.

PP60

Vocal Fold Injection Medialization Laryngoplasty in Patients with Unilateral Vocal Fold Paralysis and Symptoms of Dysphagia

Bohlender, Joerg E.*1; Duan, Jingming²; Castiglioni, Kristina²

¹Department of Phoniatrics and Logopedics, ENT, University Hospital of Zurich, Frauenklinikstr. 24, Switzerland; ²Department of Phoniatrics and Logopedics, ENT, University Hospital of Zurich, Switzerland

Introduction: Unilateral vocal fold paralysis (UVFP) can cause glottic insufficiency which results in a particularly hoarse voice. Some patients with UVFP show associated symptoms of dysphagia with or without aspiration. In addition to improve the voice, classical voice therapy and surgical approaches (thyroplasty, vocal fold injection medialization laryngoplasty) take account of more and more swallowing difficulties. **Method:** Between 2009–2012 transoral vocal fold injection medialization laryngoplasty was performed on 63 patients with UVFP in an office-based setting (Department of Phoniatrics and Logopedics, University Hospital Zurich). Among these patients, 23 patients had symptoms of dysphagia.

Results: 21 of the 23 UVFP patients with symptoms of dysphagia finally managed to improve their swallowing problems.

Discussion: The transoral injection laryngoplasty offers an easy and fast technique for unilateral vocal fold paralysis with symptomatic dysphonia and dysphagia. The video-controlled treatment can be performed in outpatient office under topic anesthesia. This effective surgical option should be discussed with the patients affected by UVFP and dysphagia.

PP61

Therapy Outcomes with Neuromuscular Electrical Stimulation (NMES): Case Series on Dysphagia Management from Singapore

Vasudeva, Radika*

Integrated Speech and Swallow Works Pte Ltd, 360 Orchard Road, Singapore

Background: Electrical stimulation (NMES) in Dysphagia Management is relatively new in Asia. We have seen publications from countries such as Thailand (Leelamanit 2002) and Korea (Lee et al. 2012) on this. Launched during 2005 in Singapore, VitalStim therapy as a modality for dysphagia management has been steadily growing in this part of the world.

Purpose: This paper reports therapeutic outcomes of electrical stimulation with functional exercises on six clients with varied etiological conditions in the age range 3–80 years.

Methods: All patients in this study had an initial clinical assessment followed by an objective assessment of swallowing with either Functional Endoscopic Examination of Swallowing and or Video-fluoroscopy. They underwent daily therapy sessions upto 20, using VitalStim therapy (NMES). The Stimulation lasts 45 min each session, while the patients consumed appropriate foods and fluids and also performed specially chosen oral-motor, voice or swallowing exercises.

Results: All patients demonstrated improved swallowing as reflected by a series of outcome measures: VFS/FEES ratings, FOIS scores, clinical and subjective reports.

Conclusion: This study highlights the importance of using a modality such as NMES as an integral part of therapy.

PP62

Treatment of Dysphagia Related to Wallenberg Syndrome: Report of Two Cases

Kalf, Hanneke*

Radboud University Nijmegen Medical Centre, P.O. Box 9101, The Netherlands

Introduction: Wallenberg's syndrome (WS) is a rare, but welldefined clinical condition, usually caused by lateral medullary infarction (LMI). It may include severe pharyngeal dysphagia or even aphagia, causing tube feeding dependency and the need to spit out saliva to prevent continuous aspiration. Some patients even require a canula for tracheal suctioning. Clear evidence is lacking for the optimal treatment approach.

Methods: Two patients with a history of WS and no recovery were referred for a second opinion to our university hospital. Patient B. (man, 64 years), suffered from a LMI resulting in aphagia (FOIS 1) and mild ataxia. He was assessed at six months post onset. Swallowing seemed to be recovering slightly, but he still choked on most trial swallows. He was taught to swallow hard while swallowing normal sips of only water, one cup three times a day. He gradually regained control and after two months of intensive training he could drink and eat almost everything (FOIS 6). Patient K. (man, 74 years), suffering from severe WS, aphagia and severe ataxia was assessed at one year post onset. With the same approach he recovered from FOIS 1 to FOIS 4.

Results: Two patients with pharyngeal aphagia gradually recovered swallowing at six and twelve months post onset by intensive exercises with water while swallowing hard.

Discussion: Many more cases and controlled comparisons are needed to understand the best approach and timing to rehabilitate this severe dysphagia.

PP63

Evaluation and Treatment: Late Swallowing Dysfunction in Pharyngeal Cancer Patient Treated with Radiotherapy

Guillén-Solà, Anna^{*1}; Bofill Soler, Neus²; Sartor, Monique²; Lobato, Anna²; Donaire Mejías, M. Fernanda²; Lozano Galán, Joan²

¹Hospitals Mar-Esperança. Parc de Salut Mar, c/Sant Josep de la Muntanya 12, Spain; ²Hospitals Mar-Esperança. Parc de Salut Mar, Spain

Introduction: Pharyngeal cancer is one of the low-grade head and neck tumors and has a good prognosis. Radiotherapy protocols try to preserve the essential organs for swallowing and speech, but do not guarantee correct future functionality.

Materials and Methods: A 58-year-old, former smoker of 3 packs/ day, with a history of squamous cell carcinoma in both left pyriform sinus and arytaeno-epiglottic fold (T2N0M0). It was treated with radical intention radiotherapy. The patient received a total dose of 70 and 50 Gy on the tumoral and risk areas, respectively, for two months. 11 years later, is referred to the Rehabilitation Department for a swallowing study after showing xerostomy, dysphonia, nasal regurgitation, sore throat, cough with liquid and increased intake time. Videofluoroscopy and EMG were performed and the patient started treatment with transcutaneous electrical neuromuscular stimulation.

Results: The videofluoroscopy revealed severe oropharyngeal dysphagia with impaired signs of efficacy and safety for oral and pharyngeal phase. These determine a deficit of the airway protection and a 25–50 % bolus residue level of vallecula, pyriform sinus, hypopharynx and upper esophageal sphincter, presenting aspirations to medium volumes of liquid and nectar (PAS 7.DOSS 3). EMG supported post-radiation neuropathy affecting the superior laryngeal nerve and facial nerve portion of the neck muscles. After 15 sessions of VitalStim, videofluoroscopy showed a slight improvement due to a better residual control, but not sufficient to change the rating scale score.

Conclusion: Most patients who undergo radiotherapy (65–70 Gy) experience significant side effects and long term complications. The effects of radiation therapy can appear years later, need to be present.

PP65

Parameter Extraction for Tongue Pressure Measurements Using Dimensionality Reduction

Conway, Richard*¹; Casey, Vincent²; Perry, Alison²

¹University of Limerick, ECE Department, Ireland; ²University of Limerick, Ireland

Introduction: Oral measurements for swallowing typically utilize a measure of peak pressure for assessing the efficacy of a subject's swallow. While using only one parameter simplifies classification, it fails to exploit other distinguishing information. Other parameters such as timing (including rise and fall times) have been used, but these make interpretation and comparison across swallows difficult. **Materials and Methods:** In this paper we describe Principal Components Analysis (PCA) as a method for extracting relevant

parameters from the swallow impulse response. For swallowing, the time-sampled impulse response represents an N-dimensional signal (where N is the number of samples, e.g. 400). These impulse responses are used with PCA to obtain a new basis of representation using only K values, where K varies from 3 to 30. These K terms represent the most significant components needed to reconstruct the signal and, most importantly, they enable calculation of a distance metric.

Results: Using trial data obtained from healthy subjects, this technique has been successfully deployed. For an individual subject, values of K from 3 to 10 are required to represent 90 % of the original signal's energy, while for a group of subjects, K varies from 15 to 30. **Discussion:** A significant advantage of PCA is that a comparison of subjects' swallows is possible by computing a distance metric using the new basis representation. The distance metric is a single scalar value that can be used directly by clinicians to quantitatively; (i) access changes in an individual's swallows and (ii) compare an individual with benchmark distance metrics.

PP66

Clinical Evaluation of Complaints and Swallowing in Patients Affected by Head and Neck Cancer Treatment in Cancer Hospital

Soria, Franciele*¹; Furkim, Ana Maria²; Demenech, Deborah³; Orejuela, Dani Andreia³

¹Faculdade Assis Gurgacz, Rua das Papoulas, 70, Brazil; ²UFSC, Brazil; ³FAG, Brazil

Introduction: Dysphagia has received special attention as a symptom of cancer, as there is an intrinsic relationship between this elementary function of swallowing and general condition of the patient especially in terms of nutrition and also about the risk of aspiration. In this sense, the dysphagia is reported as one of the main complaints of patients with head and neck cancer, considered serious sequela of this disease and anticancer treatment. Currently the Speech character sets as significant for health promotion in hospitals to investigate the relationships between the neoplastic disease, its location at the head and neck, their possible treatments, and its effects on swallowing, thus justifying the purpose of this paper.

Methodology: Exploratory research at the Cancer Hospital of Cascavel, Brazil, patients with head and neck cancer, with site investigation and staging of the lesion and the clinical evaluation of dysphagia.

Results: 100 % of patients complained of dysphagia, with 22.22 % having seen the symptoms Already before the onset of cancer. The 3 speech complaints of dysphagia more incidents were cough, 81.14 %, pain, 74.07 %, and the feeling of "wet voice", 66.67 %. Decreased vocal intensity after swallowing, choking and discomfort were seen in 48.15 % of the reports. In turn, it was found burning and Decrease in voice quality after swallowing in 40.74 %, 22.22 % had difficulty breathing after swallowing. After the offering, 75 % auscultation Showed positive; 82 % had wet voice, and 67.86 % had Reduced vocal intensity.

Discussion: That there is evidence of Significant changes in swallowing process, before and after the diagnosis of cancer, and that complaints about swallowing were highly incidents, as well as clinical signs during the evaluation of these patients.

PP67

Swallowing Disorders and Quality-of-Life in the Elderly: Relation with Self-Perception and Signs of Dysphagia

Lopes, Inês*1; Nogueira, Dália2; Reis, Elizabeth2

¹Lisbon University Institute, Av. das Forças Armadas, Portugal; ²Lisbon University Institute, Portugal

Introduction: The ability to take oral feeding has a great emotional and social impact. When older people have swallowing disorders they often have problems to eat in public. In addition, as food plays an important sociocultural role, eating difficulties sometimes bring anxiety and social withdrawal.

Materials and Methods: The present study was designed to determine the prevalence of self-perceived and objective signs of dysphagia and its related quality-of-life issues in a population 65 and older (136) receiving institutional care. A set of instruments were used to assess and quantify different domains of health. Observable signs of dysphagia were assessed by a SLP and registered as positive or negative. The Eating Assessment Tool (EAT 10) was used to assess self perception of swallowing disorders and the EQ-5D (EuroQol Group) to assess quality of life related to health.

Results and Discussion: About 30 % of the total sample presented positive signs for dysphagia but only 11 % referred problems when completing the EAT 10. In conclusion, there is a relatively high prevalence of positive signs of dysphagia in this population and a self reported quality-of-life impairment is also a frequent finding. However, the EQ-5D weakly correlated with the EAT 10. In conclusion this study reports a fairly prevalence of swallowing concerns in the elderly, even among those who were identified as having positive signs for dysphagia which points to an inaccurately self perception of the swallowing problems, supporting the role of education about the risk of dysphagia in this population.

PP68

Dysphagia Trial in Elderly Population

Soria, Franciele*¹; Furkim, Ana Maria²; Sant'Ana, Fernanda³; Eger, Lessandra³

¹Faculdade Assis Gurgacz, Rua das Papoulas, 70, Brazil; ²UFSC, Brazil; ³Faculdade Assis Gurgacz, Brazil

Introduction: Feeding is a necessary act to human survival, being considered source of pleasure and fellowship. In the aging process, one of the functions that suffers alteration is the swallow, which may change the oral, pharyngeal and esophageal stage. The swallowing disturbs caused by the aging can be conceptualized as presbyphagia. However, the swallowing disturbs caused by neurological and/or structural disorders are called dysphagia, and even those disturbs as the presbyphagia may result an alteration of the individual clinical state. The complications from those swallowing disturbs may generate nutritional issues, including occasioning death.

Methodology: Was realized the Screening for Dysphagia Oropharyngeal in Elderly Population Group Risk protocol, which had questions about dyspaghia's signs and symptoms. The protocol was applied in 97 individuals above 60 years, from both genders.

Results: In this study, 56.70 % of elderly individuals presented susceptibility to develop dysphagia.

Discussion: We conclude that exists a tendency of swallowing complains and consequently a possible dysphagia frame in elderly population.

PP69

Speech Therapy Contribution to an Institutional Protocol in Cerebral Vascular Accident

Soria, Franciele^{*1}; Furkim, Ana Maria²; Nascimento Junio, Jose Ribamar³; Viana, Juliana Medeiros³; Guimaraes, Roberta Souza³

¹Faculdade Assis Gurgacz, Rua das Papoulas, 70, Brazil; ²UFSC, Brazil; ³IGD, Brazil

Introduction: According to the World Health Organization, Cerebral Vascular Accident (CVA) is defined as "a clinical sign of quick development of a focal disturbance of brain function having a possible vascular source, and with more than 24 h". Studies that comprised the epidemiological aspects and natural history of dysphagia, associated to CVA clinical conditions, point out an incidence around 50 % for swallowing disorders. The elaboration of protocols aims at assuring the quality of what is being offered, besides allowing the application of the actuating concept, based in evidences contributing for a better assistance.

Materials and Methods: A retrospective study was performed through the records of 115 patients(75 M/40 F)diagnosed with CVAi included in an institutional protocol of a general hospital in São Paulo, in the period between January 2010 and March 2012.

Results: Was observed that 22 % had an alternative way of feeding previously to the speech therapy assessment; 59 % in fasting awaiting assessment for determining the nutrition conduct, and 31 % with oral ingestion of food released prior to the assessment. From the assessed patients, 38 % were diagnosed with Neurogenic Oropharyngeal Dysphagia and 62 % were classified as functional/normal swallowing. From the patients that were sent to speech therapy tracking/rehabilitation, 54 % were under fasting previously to the assessment, 24 % had FOIS > 4; 22 % had FOIS < 3; after speech therapy rehabilitation, 84 % presented FOIS > 4 and 16 % presented FOIS < 3.

Discussion: The precocious speech therapist attendance to patients with CVAi through the insertion of this professional in a specific protocol, applied so as to avoid possible complications in the acute phase of the disease, such as bronchoaspiration, is paramount for a better safety of the patient regarding nutrition and his/her rehabilitation prognosis.

PP70

Preoperative SWAL-QOL and Swallowing Function in Parkinson's Patients Selected for Deep Brain Stimulation

Sundstedt, Stina*1; Olofsson, Katarina²

¹Department of Clinical Sciences, Division of Otorhinolaryngology, Umeå University, Sweden; ²Department of Clinical Sciences, Division of Otorhinolaryngology, Sweden

Introduction: Parkinson's patients are often troubled by dysphagia, affecting quality of life and the physical wellbeing of the patients. The primary aim of this study was to describe Swallowing Quality of Life (SWAL-QOL) data from patients selected for Deep Brain Stimulation

and to investigate the correlation between SWAL-QOL and preoperative fiber endoscopic evaluation of swallowing as well as selfassessments on a visual analogue scale. A secondary aim was to investigate the correlations between disease duration and the SWAL-QOL scores as well as the parameters from the fiber endoscopic examination.

Method: Ten patients (age 45–69 years, median 61.5 years, all male) with Parkinson's disease who were selected for Deep Brain Stimulation completed a Swallowing Quality of Life form, self-assessed their swallowing function using a visual analogue scale and underwent a fiber endoscopic evaluation of swallowing function.

Results: The total SWAL-QOL median score was 94 % and the mean score was 91 % (100 % equals best possible SWAL-QOL). The median score from self-assessments was 85 % and the mean score was 93 % (100 % equals perfect self-perceived swallowing function). A correlation was seen between low total SWAL-QOL score and long disease duration measured as years since diagnosis (r = -.72, p < .05). Long disease duration measured as years with symptoms correlated with more pre-swallow spillage (r > .63, p < .05).

Discussion: The swallowing related quality of life was high in the studied group. Results from self-assessments and the fiber endoscopic evaluations also indicated good swallowing function in the patients. Long disease duration was found to correlate with negative influence on swallowing function and lower SWAL-QOL scores.

PP71

Evaluation of Disease Specific Quality of Life in Dysphagic Stroke Patients Using Clinical Scoring Instruments

Ende, Franziska^{*1}; Höhlig, Juliane¹; Bräuer, Götz¹; Höhlig, Carolin¹; Koch, Horst J.¹; Reichmann, Heinz²; Ickenstein, Guntram W.¹

¹HELIOS General Hospital Aue—Technical University Dresden, Germany; ²Carl Gustav Carus University Hospital Dresden, Germany

Introduction: The management of neurogenic oropharyngeal dysphagia (NOD) is an important factor to prevent complications like pneumonia, malnutrition and reduced quality of life. It is essential to identify the factors that cause a reduction in the quality of life and thus develop a suitable therapy that counteracts these. There is still a question what kind of clinical parameters would identify neurogenic oropharyngeal dysphagia at an early stage and are therefore predict stroke- or swallowing specific quality of life.

Materials and Methods: Based on a prospective longitudinal study, data of the stroke- and swallowing-specific quality of life and influencing factors (e.g. functional status, degree of dysphagia, severity of stroke) of 101 stroke patients were collected within the first week and the three month after an acute stroke. To assess the quality of life, validated questionnaires, the Swallowing-Quality of Life (SWAL-QoL) and the Stroke-specific Quality of Life Scale (SSQL), were used. Results: 101 dysphagic stroke patients were analyzed within the first three month after acute stroke. There was no significant association between basic patient characteristics and the outcome of stroke- and swallowing-specific quality of life after three months. However severe stroke (NIHSS > 10), reduced functional status (FIM < 63) and the need of a nasogastric tube (FCM < 4) within the first week after stroke had a significant association with reduced stroke- and swallowing specific quality of life 90 days after acute stroke. There was no independent association in a multivariate model to predict the three months-quality of life outcome within clinical scoring systems. however there was a significant correlation between important clinical parameters (NIHSS, FIM, FCM) and the stroke-/swallowing specific quality of life at the same day with the strongest correlation between the grade of swallowing dysfunction and the swallowingspecific quality of life (r = 0.70). In addition the need of a nasogastric tube in connection with reduced functional status was highly correlated with reduced stroke-specific quality of life ($R^2 = 0.64$). Interestingly in consideration with the subscales of SWAL-QoL the "fear of choking" only marginally affected the quality of life.

Discussion: More and more attention is given to structured concepts for diagnosis and treatment of dysphagia in the last years. Because the quality of life is highly correlated with functional deficits (NI-HSS > 10, FCM < 4, FIM < 63), there is a need of early diagnosis and treatment of functional status to enhance the individualized neurorehabilitation concept and the present quality of life. Currently no multivariate model exists, that predicts the three months outcome of stroke- or swallowing-specific quality of life by means of clinical scoring systems.

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Functional Magnetic Stimulation for Post-Stroke Dysphagia

Momosaki, Ryo*¹; Abo, Masahiro²; Watanabe, Shu²; Kakuda, Wataru²; Yamada, Naoki²; Mochio, Kenjiro²

¹Department of Rehabilitation Medicine Jikei University School of Medicine, 3-25-8, Japan; ²Department of Rehabilitation Medicine Jikei University School of Medicine, Japan

Introduction: Recently the usefulness of neuromuscular electrical stimulation and repetitive transcranial magnetic stimulation for poststroke dysphagia has been reported. However there is no report that describes the effectiveness of functional magnetic stimulation (FMS) for dysphagia. The purpose of this study is to clarify the effectiveness of FMS for post-stroke dysphagia.

Materials and Methods: Twenty post-stroke dysphagic patients (age at treatment: 51–80 years; interval between onset of stroke and treatment: 6–36 months) were randomly assigned to a real group or a sham group. In the real group, FMS of 30 Hz was applied for suprahyoid muscles in a 20-s train using a parabolic coil for 10 min (total 600 pulses). In the sham group, sham stimulation was applied for 10 min at the same site. Swallowing function was evaluated by the timed water swallow test, inter-swallow interval (ISI), swallowing volume velocity (speed), and volume per swallow (capacity) were measured before and after stimulation.

Results and Discussion: All patients completed the stimulation and none showed any adverse reactions throughout the stimulation. The improvement of speed and capacity of swallowing after stimulation was significantly larger in the real group compared with the sham group (all p < 0.05). However, no significant difference in the ISI was found between the groups. FMS of neck using a parabolic coil can potentially improve swallowing function in post-stroke dysphagic patients.

PP73

The Impact of Swallowing Impairment on Quality of Life in Different Parkinsonian Syndromes

Hamacher, Christina^{*1}; Oelenberg, Stephan²; Suntrup, Sonja²; Suttrup, Inga²; Buschmeier, Felix²; Dziewas, Rainer²; Warnecke, Tobias² ¹University Hospital of Muenster, Department of Neurology, Albert-Schweitzer-Campus 1, Germany; ²Department of Neurology, University Hospital of Münster, Germany

Introduction: Dysphagia is a common symptom in Parkinsonian syndromes predisposing the patient to malnutrition and aspiration pneumonia. The aim of the present study was to collect specific data about the impact of swallowing impairment on quality of life in different Parkinsonian syndromes.

Methods: Forty-two consecutive patients with idiopathic Parkinson's disease (PD; n = 23; m/w 12/11; age 65.83 \pm 12.10 years), multiple system atrophy (MSA; n = 7; m/w 4/3; age 62.14 \pm 9.96 years) and progressive supranuclear palsy (PSP; n = 12; m/w 4/8; age 68.83 \pm 5.54 years) were included. Disease stage was measured with the Hoehn and Yahr scale. All subjects underwent fiberoptic endoscopic evaluation of swallowing (FEES). Dysphagia severity was rated according to an endoscopic 4-point-scale (0 = no, 1 = mild, 2 = moderate, 3 = severe). Every participant was also asked to fill out the Swallowing Quality of Life Questionnaire (SwalQuol).

Results: The mean Hoehn and Yahr scale was distinctly higher in PSP patients (3.73 ± 1.10) compared to PD patients (2.57 ± 0.95) and MSA patients (2.71 ± 0.76) . FEES revealed a mean dysphagia severity score of $1.0 (\pm 0.00)$ for dysphagic patients with MSA, of $1.25 (\pm 0.62)$ for dysphagic patients with PSP and of $1.25 (\pm 0.62)$ for dysphagic patients with PD indicating mild swallowing impairment in the majority of cases. Eleven PD patients showed a normal swallowing function. The mean total score of the SwalQuol was 169.58 in dysphagic PD, 187.74 in dysphagic MSA, and 154.17 in dysphagic PSP. PD patients without dysphagia had a mean total score of 207.55.

Discussion: In PD, MSA and PSP even mild dysphagia without aspiration events is associated with a significant decrease in quality of life compared to nondysphagic subjects.

PP74

Swallowing Assessment in Myotonic Dystrophy Using Fees

Pilz, Walmari^{*1}; Baijens, Laura¹; Lima Passos, Valeria²; Verdonschot, Rob¹; Wesseling, Frederik¹; Kremer, Bernd¹

¹Department of Otorhinolaryngology, Head and Neck Surgery, Maastricht University Medical Center, The Netherlands; ²Department of Methodology and Statistics, Maastricht University, The Netherlands

Introduction: Oropharyngeal dysphagia is a common symptom in myotonic dystrophy (MD). High standard investigations of swallowing in MD patients are scant. As a result, the pathophysiology of swallowing in this population remains unclear. This study aims to describe the swallowing function of MD type 1 patients. For this purpose, patients and healthy control subjects underwent a standardized FEES protocol to (a) identify which and to what extent swallowing parameters change for MD patients, relative to controls and (b) to investigate whether the degree of oropharyngeal dysphagia can be associated with disease severity.

Materials and Methods: Forty five consecutive patients with a diagnosis of MD type 1 underwent a swallowing assessment including a standardized FEES protocol using different bolus consistencies. Clinical severity of the disease was assessed using the Muscular Impairment Rating Scale (MIRS). Six visuoperceptual ordinal parameters of swallowing were analyzed and compared to the same parameters in ten healthy control subjects. Intra- and interrater reliability was determined.

Results: Significant group differences were found between healthy control subjects and patients for all visuoperceptual ordinal parameters. The magnitude of differences depended on the bolus consistency. The odds for having a more pathological swallowing outcome increased significantly with higher levels on the MIRS.

Conclusion: Swallowing function is significantly altered in MD patients. The results emphasize the importance of a detailed swallowing assessment, especially in patients with high scores on the MIRS. An early detection of oropharyngeal dysphagia may prevent commonly associated health complications, such as aspiration pneumonia.

PP75

Effect of Cortical Repetitive Transcranial Magnetic Stimulation on Oropharyngeal Dysphagia in Patients with Wallenberg Syndrome

Roy, Anne Laure¹; Marie, Jean Paul²; Verin, Eric*¹

¹Crmpr Les Herbiers, France; ²Service de Chirurgie Cervico Faciale, Chu Rouen, France

Introduction: Swallowing problems are very frequent in Wallenberg syndrome. In these patients, the paralysis of the IX and the X cranial nerves, often unilateral, could compromise swallowing efficiency for a long term. This need for the patient to have an exclusive feeding with a gastrostomy for many years. The aim of our study was therefore to test the effect of cortical repetitive transcranial magnetic stimulation (rTMS) to improve oropharyngeal dysphagia in these patients.

Method: Three patients were studied. Swallowing function was explored by pharyngeal high resolution video manometry before and after each session of rTMS. There were three sessions of rTMS spaced by 6 months. Each rTMS session consisted in 20 min of 1 Hz frequency cortical stimulations on the pharyngeal motor cortex, 10 min on each hemisphere. During the rTMS session, submental electrical stimulation was performed with TENS at sensitive threshold.

Results: The three patients did not present adverse effect of magnetic stimulations. Initially, before rTMS, all the patients presented a pharyngeal residue of all the bolus, without any efficient swallowing with an increase of superior oesophageal sphincter. This was responsible of bronchial aspirations. After three sessions of rTMS, 18 months later, one patient could have a partial oral feeding, one patient recovered a pharyngeal peristaltism with an opening of the superior oesophageal sphincter, and one patient did not improve the swallowing function.

Conclusion: This study showed that transcranial rTMS could be an original treatment of oropharyngeal dysphagia in brainstem infarction and should be evaluated.

PP76

Dysphagia in Patients with Multiple-System Atrophy— Relationship Between Oral Dysfunction and ADL Deterioration

Umemoto, George*¹; Furuya, Hirokazu²; Tsuboi, Yoshio³; Sakai, Mitsuaki²; Kikuta, Toshihiro³

¹Fukuoka University, 7-45-1 Nanakuma, Jonan-ku, Japan; ²National Omuta Hospital, Japan; ³Fukuoka University, Japan

Introduction: Few studies have evaluated dysphagia in patients with multiple system atrophy (MSA), comparing between two types of MSA with predominant cerebellar ataxia (MSA-C) and with predominant Parkinsonism (MSA-P). This study aims to demonstrate the relationship between dysphagia and activities of daily living (ADL) in patients with multiple system atrophy (MSA).

Materials and Methods: Twenty-six MSA patients (7 males and 19 females; mean age, 66.6 ± 9.1) consisted of 15 with MSA-C and 11 with MSA-P were recruited. The ADL assessment was made by scoring the period of walking, wheelchair and bedridden. They underwent measurements of tongue pressure using a handy probe and videofluoroscopy (VF) for swallowing using 1.5 mL of barium gelatin jelly as a test food. We measured the range of tongue root and mandibular movement during oropharyngeal transit time and scored the functional dysphagia scale in oral and pharyngeal stage based on the VF images.

Results: Significant correlations were found between the ADL and dysphagia score (p = 0.008, R = 0.529) and between the ADL score and the tongue pressure (p = 0.005, R = -0.573) in the 26 patients. In particular, there was a significant correlation between the ADL and oral dysphagia score in the MSA-C group (p = 0.004, R = 0.760) and between the ADL score and the tongue pressure in MSA-P (p = 0.015, R = -0.768). The range of tongue root and mandibular movement of the MSA-C group was larger than those of the MSA-P group.

Discussion: These results suggested the relevance between ADL deterioration and dysphagia progression in MSA patients. MSA-C patients tend to have incoordination and MSA-P patients do to become smaller in range of tongue root and mandibular movement.

PP77

The Endoscopic Evaluation of Swallowing with Different Consistencies in Post-Stroke Individuals

Onofri, Suely M. M.¹; Cola, Paula C.²; Berti, Larissa C.¹; Silva, Roberta G.¹; Dantas, Roberto O.*³

¹Sao Paulo State University, Brazil; ²Marilia University, Brazil; ³São Paulo University, Brazil

Stroke is the most common neurological disorder in adults associated with oropharyngeal dysphagia and the fiberoptic endoscopic evaluation of swallowing (FEES) is important to determine the presence and severity of dysphagia. The aim of this study was to evaluate if the different food consistencies interfere with the findings of the FEES in the post-stroke individuals. A cross-sectional clinical study was performed with 81 supratentorial post-ischemic stroke individuals, with mean age of 67.7 years, 37 female and 44 male, average time since injury of 24 months, 33 right side and 48 left side. All underwent FEES with pureed, thickened liquid, and liquid food consistencies, 5 e 10 mL, via spoon, and evaluated parameters such as premature oral leakage, pharyngeal residues, laryngeal penetration, and tracheal aspiration. Premature oral leakage was observed in 61/81 (75.3 %) individuals with pureed, 66/81 (81.5 %) with thickened liquid, and 71/81 (87.6 %) with liquid consistency (p \leq 0.00); pharyngeal residues in 27/81 (33.3 %) with pureed and thickened liquid, and 28/81 (34.6 %) with liquid (p \leq 0.81); penetration in 10/81 (12.3 %) with pureed consistency, 15/81 (18.5 %) with thickened liquid, and 23/81 (28.4 %) with liquid (p \leq 0.00); aspiration in 4/81 (5 %) with pureed consistency, 9/81 (11.1 %) with thickened liquid, and 19/81 (23.5 %) with liquid (p \leq 0.00). There were statistically significant differences (ANOVA Friedman) in the premature oral leakage, laryngeal penetration and tracheal aspiration. These findings confirm different consistencies demonstrate interference in FEES. The liquid consistency was the most altered, followed by thickened liquid and pureed.

PP78

Oral Feeding Outcomes in a Population of Tracheostomy and Ventilator Dependent Babies and Young Children with Congenital Medical Conditions: On Discharge from Hospital and at Longer Term Follow Up

Greene, Zelda*1

¹Our Lady's Children's Hospital Crumlin, Crumlin, Ireland

Introduction: With increasing survival rates of children with medically complex conditions, the incidence of babies and young children who are tracheostomy and ventilator dependent (TVD) is on the rise. The effects of tracheostomy and ventilation on swallowing are documented. Oral feeding in this group is complex and outcomes are underexplored. This study aimed to determine feeding outcomes in this complex population and to investigate contributing factors to these.

Methods: This retrospective review followed cases discharged from a transitional care unit (TCU) in an acute pediatric teaching hospital. Medical diagnosis, length of stay (LOS), airway requirements and oral feeding status both on discharge and at long term (12+ months) follow up were recorded.

Results: 27 cases met inclusion criteria. 3 (11 %) were full oral feeders (FOF), 13 (48 %) had feeding tubes and varying levels of oral intake, 8 (29 %) were aversive to oral feeding, 3 were fully tube fed for medical reasons. 22 (81 %) were TVD, 2 had tracheostomy only, 2 decannulated, 1 needed overnight ventilation only. At follow up (N = 25; 1 RIP/ 1 unknown) 4 more had become FOF i.e. total 7 (28 %) FOF. 10 (40 %) had feeding tubes and varying levels oral intake, 5 were aversive feeders, 1 fully tube fed for medical reasons. 7 were decannulated. 6 had weaned off ventilation but still had tracheostomy. A wide variance existed for length of stay and medical diagnosis. Shorter length of stay appeared to have some positive effect on feeding outcomes.

Discussion: Oral feeding outcomes in this complex group of patients are poor, but appear to improve post discharge and appears to be associated with ventilation weaning, decannulation, and possibly reduced LOS. The complexities of oral feeding in this population are discussed.

PP79

Effect of Gender, Age, Height, Body Mass Index on EAT-10 Score in Healthy Brazilian Population

Dantas, Roberto; Nascimento, Weslania*; Alves, Leda; Silva, Ana Cristina

Medical School of Ribeirão Preto-University of São Paulo, Brazil

Introduction: The Eating Assessment Tool (EAT-10) is a selfadministered, symptom-specific outcome instrument for dysphagia. The purpose of this study was to evaluate the effect of gender, age, height, and body mass index (BMI) on EAT-10 score in healthy Brazilian volunteers. **Materials and Methods:** We used the Portuguese version (Brazil) of EAT-10 translated from the original publication (Belafsky et al., Ann Otol Rhinol Laryngol. 2008;117:919). Weight and height were measured and body mass index (BMI) of the volunteers was calculated. All subjects had no symptoms, did not take regular medications nor were in treatment for any disease and had no previous neurological diseases, head and neck surgery nor digestive surgery.

Results: We included 186 healthy volunteers, 121 women and 65 men, ages 20 to 60 years old. The mean (SD) of the total of EAT-10 score was 0.93 (2.08). The question with highest score was "Swallowing pills takes extra effort". There was no difference between men and women. There was a negative correlation between height and the score. There was no influence of age and BMI on EAT-10 scores.

Discussion: The limit of EAT-10 score in healthy Brazilian subjects was 5 (12.5 % of the maximum score). This value should be reference for the detection of swallowing difficulty in this population. There was a negative correlation between height and score, which means that higher healthy subjects are likely to have lower EAT-10 scores. There was no influence of BMI and age, at least before 60 years old.

PP80

Human Swallowing Behavior of Acidic and Neutral Liquid

Dantas, Roberto*¹; Gomes, Dafne²; Santos, Rafaela²

¹Medical School of Ribeirão Preto, University of São Paulo, Av Bandeirantes 3900, Campus da USP, Brazil; ²Medical School of Ribeirão Preto, University of São Paulo, Brazil

Introduction: The swallowing function is influenced by chemical and sensory stimuli. Swallows of a sour bolus resulted in a stronger contraction of mylohyoid, geniohyoid and anterior belly of the digastric muscles. Sour acidic liquid has a slower distal esophageal transit than a neutral liquid. Our hypothesis is that an acidic sour bolus has a different ingestion dynamic than a neutral bolus.

Materials and Methods: We evaluated the ingestion dynamics of 100 mL of acidic sour liquid (concentrated lemon juice, pH; 3.0) and 100 mL of water (pH: 6.8). In 45 healthy subjects and 14 patients in treatment with proton pump inhibitor for gastroesophageal reflux disease (GERD). We measured the time to ingest the total volume of 100 mL, the number of swallows to ingest the volume, the interval between swallows, the flux of ingestion and the volume ingested in each swallow.

Results: In both groups, healthy subjects and patients in treatment of GERD, the acidic liquid takes a longer time to be ingested, as a higher number of swallows causes a slower flux of ingestion and a smaller volume in each swallow than the neutral bolus. There was no difference between healthy subjects and patients with GERD.

Discussion: The swallowing test utilized is a reliable method to measure swallowing performance (Hamdy et al., Neurogastroenterol Motil 2003;15:69). The results showed that the acidic liquid has a different dynamic ingestion than the neutral liquid, which may be consequence of the slower transit through the distal esophageal body (Alves et al., Dis Esophagus 2013;26:305).

PP81

Effect of Acid Inputs in the Pharynx on Human Swallowing

Nakamura, Yuki*¹; Hatakeyama, Aya²; Kanda, Chika²; Inoue, Makoto²

¹Niigata University Graduate School of Medical and Dental Sciences, 2-5274 Gakkocho-dori, Chuo-ku, Japan; ²Niigata University Graduate School of Medical and Dental Sciences, Japan

Introduction: Pharyngeal mechanical stimulation can easily evoke swallowing reflex. However, it still remains unknown how the chemical inputs such as taste stimulation are involved in the initiation of swallow. In the present study, to clarify the effect of acid stimulation alone in the pharynx on swallowing initiation, we applied taste solution with several conditions to the pharynx at a very slow infusion rate and evaluated the effects of the stimulation on the swallowing behaviors.

Materials and Methods: Ten healthy volunteers participated in this study. Taste solution (sucrose, NaCl, HCl, citric acid and acetic acid) was applied into the pharynx through a fine silicone tube at a very slow rate. During taste stimulation, each subject was instructed to perform repetitive swallowing as quickly as possible and swallowing interval (SI) was measured using suprahyoid muscles EMG recordings. In addition, sensory scale of taste intensity during swallowing was measured.

Results and Discussion: Out of taste stimulants tested, acid solution facilitated initiation of swallow, in that the SI was significantly shorter during acid stimulation as compared to other taste ones. Sensory scale of taste intensity during swallowing was higher in acid solution. The function may contribute to prevention of irritant inhalation during gastrophageal reflux.

PP82

Role of Speech Language Pathologist in Diagnosis and Treatment of Dysphagia—What is the Situation in Croatia?

Vodanovic, Dinah*1; Kolundzic, Zdravko2; Gotovac, Nikola2

¹University Hospital Center Zagreb, Croatia; ²County General Hospital Pozega, Croatia

The aim was to determine the approximate number of patients with swallowing difficulties sent to fluoroscopy during the period of two years in Croatian general county hospital. We started researching medical diagnostics to determine the difficulties which patients are initially sent for and where they continue the process of diagnosis and rehabilitation. These data are important due to the fact that the speech pathologist in Croatia treat patients with dysphagia when it occurs almost only when it is recognized by the speech pathologist in cases where dysphagia present itself with other conditions and/or diseases. Making swallowing difficulties insufficiently recognized. The paper presents a review of the fluoroscopy findings. It was done 39 fluoroscopy's. Of the total number of participants there were 21 men and 18 women. Average age in men was 60 and in women 52. Identified 7 patients (5 men and 2 women), according to the findings of radiologists, had changes in terms of the objective difficulties in swallowing process. The most common changes in swallowing have been described as lagging contrast in valleculae (4 patients). None of the patients in whom is confirmed objective difficulties with swallowing is sent to speech pathologists treatment. The data show our concern of low awareness in the case of swallowing difficulties in our country making us want to change that in terms of future research and general education of population and of all health professionals.

PP83

Sepsis and Prolonged Mechanical Ventilation are Significant Risk Factors of Post-Extubation Dysphagia

Theodorakopoulou, M.*; Papadopoulos, P.; Flevari, A.; Frantzeskaki, F.; Christodoulopoulou, D.; Diamantakis, A.; Karambi, S. E.; Dimopoulou, I.; Armaganidis, A.

University Hospital of Athens ATTIKON, Greece

Introduction: Patients staying in ICU for a long period seem to experience difficulties in swallowing, either as a result of their illness or as a result of the treatments they receive. The risk factors associated with the development of postextubation dysphagia have been relatively unexplored.

Aim: To evaluate post-extubation dysphagia in septic mechanically ventilated ICU patients.

Methods: Prospective study over a period of eight months set in a 25 bed University Hospital ICU. A total of 57 (39 men) mechanically ventilated patients were included in the study who were successfully

extubated. Patients with stroke and neuromuscular disease were excluded. The group of patients was divided into septic 37 (21 men) and non septic 20 (9 men). All patients in the septic group met the ACCP/SCCM consensus criteria for sepsis. Days of mechanical ventilation and tracheostomy performed was recorded. A simple bedside swallow challenge with 90 ml of water was performed in all patients upon extubation and the results were recorded.

Results: Septic patients were older $(66 \pm 17 \text{ vs. } 45 \pm 20 \text{ years}, p < 0.001)$, and had a higher APACHE II $(21 \pm 5 \text{ vs. } 14 \pm 6, p < 0.001)$ along with a higher SOFA score $(8 \pm 3 \text{ vs. } 3 \pm 3, p < 0.001)$ compared to non-septic patients. 58 vs. 32 % of the septic group had tracheostomy, along with more days on mechanical ventilation $(12 \pm 6 \text{ vs. } 9 \pm 5)$ in comparison to the non septic group. 76 % of the septic group had positive bedside swallow evaluation (BSE) and were classified as having dysphagia vs. 52 % of the non septic group.

Conclusions: Septic patients with prolonged mechanical ventilation seem to be at higher risk of post-extubation dysphagia regardless of the tracheostomy. More research is needed to identify the factors that contribute to post extubation dysphagia and prevent complications.

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