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27th November 2020

Local Organiser:Dr Una Graham
Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast

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Programme Irish Endocrine Society Annual Meeting

27th November 2020

09.00 **Presidential welcome: Prof. Brendan Kinsley (Dublin)**

09.15 **Pediatric Lecture: Prof. John Achermann (London) 'Sex Development: A Lifelong Journey'**

10.00 **OC1: Tissue glucocorticoid metabolism in patients with adrenal insufficiency and the effects of dual-release hydrocortisone therapy: results of a prospective cross-over study.**

R Dineen[1], J Martin-Grace[1], KM Saeed Ahmed[2], I Frizelle[2], J Gibney[2], A Gunness[2], A Garrahy[1], AM Hannon[1], M W O'Reilly[1], D Smith[1], J McDermott[3], ML Healy[4], A Agha[1], A Pazderska[4], A Taylor[5], F Shaheen[5], L Schiffer[5], L Gilligan[5], LA Behan[2], W Arlt [5,6], C J Thompson[1], M Sherlock[1].

[1]Academic Department of Endocrinology, Beaumont Hospital/ RCSI.[2] Robert Graves Institute of Endocrinology, Tallaght University Hospital.[3] Department of Endocrinology, Connolly Hospital, Dublin Ireland.[4] Department of Endocrinology, St James Hospital, Dublin, Ireland.[5] Institute of Metabolism and Systems Research, University of Birmingham, Birmingham, United Kingdom.[6] Centre for Endocrinology, Diabetes and Metabolism, Birmingham Health Partners, Birmingham, United Kingdom.

10.15 **OC2: A Novel Screening Tool for the Prediction of Gestational Diabetes**

R D'Arcy[1], IE Cooke[2], DR McCance[1], UM Graham[1].

[1]Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast [2]Department of Obstetrics, Royal Jubilee Maternity Hospital, Belfast

10.30 **OC3: Use of HbA1c in Predicting Excessive Fetal Growth in Women at Risk of Gestational Diabetes Mellitus.**

R D'Arcy[1], IE Cooke[2], DR McCance[1], UM Graham[1].

[1] Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast. [2] Department of Obstetrics, Royal Jubilee Maternity Hospital, Belfast.

10.45 **OC4: Fluid Restriction results in a modest rise in plasma sodium concentration in chronic hyponatraemia due to SIAD; results of a prospective randomised controlled trial.**

A Garrahy[1], I Galloway[1], AM Hannon[1], R Dineen[1], P O'Kelly[1], WP Tormey[2], MW O'Reilly[1], DJ Williams[3], M Sherlock[1], CJ Thompson[1]

[1.]Academic Department of Endocrinology, Beaumont Hospital and RCSI Medical School, Dublin. [2]. Department of Chemical Pathology, Beaumont Hospital, Dublin. [3]. Department of Stroke and Geriatric Medicine, Beaumont Hospital and RCSI Medical School, Dublin.

11.00 - 11.30 **Coffee break with Industry Updates**

11.30 **McKenna Lecture: Prof. Donal O'Gorman (Dublin): 'How exercise and inactivity regulate insulin sensitivity'**

12.15 **OC5: Twenty years' experience of bilateral inferior petrosal sinus sampling (BIPSS) for the differential diagnosis of Cushing's syndrome– the value of a single operator.**

J Smyth [1], PK Ellis [2], H Wallace [1], UM Graham [1], JR Lindsay [1], H Courtney [1], SJ Hunter [1], D McCance [1], K Mullan [1]

[1]Regional Centre for Endocrinology and Diabetes Royal Victoria Hospital Belfast. [2] Imaging Centre, RVH, Belfast

12.30 **OC6: The psychosocial impact of frailty among people with diabetes: findings from the Study of Health Aging and Retirement in Europe (SHARE).**

MR O'Donovan[1], D Sezgin[2], R O'Caoimh[3,*], A Liew[2,4,]

[1] HRB Clinical Research Facility Cork, Mercy University Hospital, Cork.[2] College of Medicine, Nursing and Health Sciences, National University of Ireland Galway, Galway.[3] [4] Department of Endocrinology, Portiuncula University Hospital, Ballinasloe. *Co-senior author

12.45 **OC7: High HDL-cholesterol levels in Type 1 diabetes are not associated with commensurately increased cholesterol efflux capacity.**

M Ahmed[1], R Byrne[2], I Frizelle[1], W Guo[2], A Gunness[1], KS Ahmed[1], A McGowan[1], K Moore[1], G Boran[2], FC McGillicuddy[3] and J Gibney[1]

[1] Robert Graves Institute, Tallaght University Hospital, D24. [2] Department of Chemical Pathology, Tallaght University Hospital, D24. [3] Diabetes Complications Research Centre, School of Medicine, UCD, D4

13.00 **OC8. Endocrine dysfunction after checkpoint inhibitor immunotherapy in the treatment of malignant melanoma: The Northern Ireland Experience**

C Hamill[1], A Nugent[1], I Wallace[1], P C Johnston[1], B Oladipo[2]

[1] Department of Endocrinology and Diabetes, Belfast City Hospital, UK[2] Cancer Centre, Department of Oncology, Belfast City Hospital, UK

13.15 - 14.00 Lunch break with Industry updates

14.05 OC9. Immunohistochemical Analysis of Pituitary Neuroendocrine Tumours in a Tertiary Referral Centre.
PB Loughrey[1,2], SG Craig[1], EE Parkes[3], DG McArt[1], SJ Hunter[2], JA James[1,2,4].
[1]. Precision Medicine Centre of Excellence, Patrick G Johnston Centre for Cancer Research, Queen's University, Belfast.[2]. Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast Health and Social Care Trust, Belfast. [3]. Department of Oncology, University of Oxford, Oxford. [4]. Northern Ireland Biobank, Patrick G Johnston Centre for Cancer Research, Queen's University, Belfast.

14.20 OC10. Health service use and associated costs attributable to diabetes in the Mitchelstown Cohort Study.
PT Walsh[1], KN O'Neill[2], PM Kearney[2]
[1] School of Medicine, University College Cork, Cork.[2] School of Public Health, University College Cork, Cork

14.35 OC11. The Prevalence of Adrenal Insufficiency in the Irish Kidney Transplant Recipient Population
M Tomkins [1,2], J Martin-Grace [1,2], C Kennedy [1],O Mc Enroe [3],K Heverin [4], S Srinivasan [4] ,P Conlon [2,3], D De Freitas [2,3], M Denton [2,3], C Magee [2,3] , C O'Seaghdha [2,3], M O'Reilly [1,2], CJ Thompson [1,2], M Sherlock[1,2]
[1] Academic Dept of Endocrinology, Beaumont Hospital, Dublin 9 [2] Royal College of Surgeons in Ireland [3] Dept of Nephrology and Kidney Transplantation, Beaumont Hospital, Dublin 9 [4] Dept of Chemical Pathology, Beaumont Hospital, Dublin 9

14.50 OC12. Blue whiting (Micromesistius poutassou) protein hydrolysates affect glycaemic control and appetite in healthy mice, dependent on hydrolysis method.
SJ Sharkey[1], RA. Lafferty[1], PA. Harnedy-Rothwell[2], S Gite[3], J Whooley[3], RJ FitzGerald[2], FPM O'Harte[1].
[1] Diabetes Research Group, School of Biomedical Sciences, Ulster University, Coleraine, Co. Derry. BT52 1SA.[2] School of Biological Sciences, University of Limerick, Castletroy, Limerick, Ireland. [3] Bio-marine Ingredients Ireland, Lough Egish Food Park, Co. Monaghan, Ireland.

15.05 OC13. Is there an atherogenic lipoprotein phenotype in Type 1 diabetes?
I Frizelle[1], R Byrne[2], M Ahmed[1,] W Guo[2], A Gunness[1], KS Ahmed[1], A McGowan[1], K Moore[1], V Maher[1], G Boran[2], FC McGillicuddy[3] and J Gibney[1.]
[1] Robert Graves Institute, Tallaght University Hospital, D24.[2] Department of Chemical Pathology, Tallaght University Hospital, D24.[3] Diabetes Complications Research Centre, School of Medicine, UCD, D4.

15.20 OC14. A novel acylated apelin-13 analogue shows benefits on pancreatic islet cell turnover and transdifferentiation in two diabetic animal models.
FPM O'Harte, N Tandy, N Irwin, RC Moffett and PR Flatt.
Diabetes Research Group, School of Biomedical Sciences, Ulster University, Cromore Road, Coleraine, Northern Ireland BT52 1SA.

INVITED POSTER PRESENTATIONS: CASE REPORTS

15.35 P1. A case of Thyrotoxic Periodic Paralysis (TPP) as a first presentation of Graves' Disease.
S Ludgate [1,2], D Fennell [1], KW Ho [2]
[1]Department of Endocrinology, Mater Misericordiae University Hospital, Dublin[2]Department of Diabetes and Endocrinology, Ryde Hospital, Sydney, NSW, Australia

15.40 P2. Primary adrenal lymphoma presenting with symptomatic hypercalcaemia
H Forde [1], J Noble [1]. D Gibbons [2]., J Holian [3]., G Connaghan [4]., RK Crowley [1].
Department of Endocrinology[1], Pathology[2], Nephrology[3], Haematology[4]St. Vincent's University Hospital, Elm Park, Dublin 4.

15.45 P3. Dual paraneoplastic antidiuretic hormone (ADH) and adrenocorticotropic hormone (ACTH) secretion in a patient with small cell bladder carcinoma.
RM Tudor[1], N Phelan[1], ML Healy[1], A Pazderska[1]
[1]Department of Endocrinology St. James's Hospital Dublin

15.50 P4. A Conundrum of Unusual Thyroid Function Tests. A Story of Familial Dysalbuminaemic Hyperthyroxinaemia.
J Smyth [1], S Hunter [1]
[1] Regional Centre for Endocrinology and Diabetes Royal Victoria Hospital Belfast

15.55 P5. Glucose-6-phosphate-dehydrogenase deficiency unmasked by COVID-19 associated DKA and Sulphonylurea use in a patient with ketosis-prone diabetes.
E Ali[1], J Brazil[1], G Boran[1] , A McGowan[1] , J Gibney[1]
[1]Robert Graves Institute of Endocrinology, Tallaght University Hospital, Dublin 24

INVITED POSTER PRESENTATIONS: AUDITS/CASE SERIES

16.00 **P6. An Irish National Diabetes in Pregnancy Audit Report 2016-2018 : Aiming for better outcomes for women with pre-gestational diabetes.**
C Newman[1], AM Egan[1], L Carmody[1], B Kirwan[1], F Dunne[1] on behalf of the National Diabetes in Pregnancy Audit Working Group
[1]National University of Ireland, Galway, Republic of Ireland

16.05 **P7. The Natural History of Clinically Non-functioning Pituitary macroadenomas (NFPAs) managed conservatively**
L Cussen[1], K Burke[1], M Javadpour[2], A Agha[1]
[1]Department of Endocrinology, Beaumont Hospital and RCSI[2]Department of Neurosurgery, Beaumont Hospital and RSCI

16.10 **P8. A retrospective review of outcomes after pituitary apoplexy in a tertiary pituitary centre.**
I.Galloway[1], E. Reece [1], M.Tomkins [1], A. Garrahy [1], J. Martin-Grace [1], P. Logan [3], D. O'Brien [2], D. Rawluk [2], M. Javadpour [2], M. O'Reilly [1,4], A. Agha [1], M. Sherlock [1,4] and C.J. Thompson [1,4]
[1]Academic Department of Endocrinology, Beaumont Hospital, Dublin [2]Department of Neurosurgery, Beaumont Hospital, Dublin[3]Department of Neuro-ophthalmology, Beaumont Hospital, Dublin. [4]Academic Dept of Endocrinology, RCSI Medical School, Dublin

16.15 **P9. An audit of the screening and management of dyslipidaemia in a regional paediatric type 1 diabetes population**
N.P. Dalton[1], S.T. O'Brien[1], T. Martin[1], T. Dunne[1], R. Power[1], C.S. O'Gorman[1], O.M. Neylon[1]
[1]Department of Paediatrics, University Hospital Limerick, Dooradoyle Limerick

16.20 **P10. Multi-Centre Real-World Data on FreeStyle Libre in the Republic of Ireland**
L Cussen [1], E McGee [1], D McDonnell [1], O Kgosidialwa [1], R Davern [2], E O'Sullivan [2], Casey C[3], A Tuthill [3], F Dunne [2], D Smith [1]
[1].Endocrinology Department, Beaumont Hospital, Dublin and RCSI[2]. Endocrinology Department, Galway University Hospital and NUIG[3]. Endocrinology Department, Cork University Hospital and UCC

16.25 **Hadden Lecture: Prof. Helen Murphy (Cambridge) 'Management of Diabetes Pregnancy in 2020 and beyond….'**

17.10 **Prize giving and closing comments (Prof. Brendan Kinsley)**

Abstracts: Oral Presentations

OC1. Tissue glucocorticoid metabolism in patients with adrenal insufficiency and the effects of dual-release hydrocortisone therapy: results of a prospective cross-over study

R Dineen[1], J Martin-Grace[1], KM Saeed Ahmed[2], I Frizelle[2], J Gibney[2], A Gunness[2], A Garrahy[1], AM Hannon[1], M W O'Reilly[1], D Smith[1], J McDermott[3], ML Healy[4], A Agha[1], A Pazderska[4], A Taylor[5], F Shaheen[5], L Schiffer[5], L Gilligan[5], LA Behan[2], W Arlt [5,6], C J Thompson[1], M Sherlock[1]

[1]Academic Department of Endocrinology, Beaumont Hospital/ RCSI[2] Robert Graves Institute of Endocrinology, Tallaght University Hospital [3]Department of Endocrinology, Connolly Hospital, Dublin Ireland [4]Department of Endocrinology, St James Hospital, Dublin, Ireland [5]Institute of Metabolism and Systems Research, University of Birmingham, Birmingham, United Kingdom[6] Centre for Endocrinology, Diabetes and Metabolism, Birmingham Health Partners, Birmingham, United Kingdom.

Background: Patients with adrenal insufficiency (AI) require life-long glucocorticoid (GC) replacement therapy. Within tissues, cortisol (F) availability is under the control of the isozymes of 11β-hydroxysteroid dehydrogenase (11β-HSD). We hypothesize that corticosteroid metabolism is altered in patients with AI due to the non-physiological pattern of current hydrocortisone (HC) replacement therapy. The use of once-daily dual-release hydrocortisone (DR-HC) preparation (Plenadren®) offers a more physiological cortisol profile and may alter corticosteroid metabolism in vivo. Study Design and Methods: An in-vivo assessment of tissue corticosteroid metabolism (using urinary steroid metabolomics, cortisol generation curves and adipose tissue biopsies) was performed in the 51 patients with AI (primary and secondary) before and after 12 weeks of DR-HC and compared to age-and BMI-matched controls. Results: Patients with AI (n = 51) receiving immediate-release HC (IR-HC) had a higher median 24-hour excretion of urinary cortisol compared to healthy controls [72.1 μg/24 hrs (IQR 43.6-124.2) vs 51.85 (35.5-72.3), p = 0.02], with a lower global activity of 11β-HSD2 and higher activity of 5-alpha reductase. Following the switch from IR-HC to DR-HC therapy, there was a significant reduction in urinary F and total GC metabolite excretion, which was most significant in the evening on diurnal urine sampling. There was an increase in global 11β-HSD2 activity. Hepatic 11β-HSD1 activity was not significantly altered post-DR-HC but there was a significant reduction in gene expression of 11β-HSD1 in subcutaneous adipose tissue. Conclusion: Using comprehensive in-vivo techniques we have demonstrated significant abnormalities in glucocorticoid metabolism in patients with AI driven by dysregulation in the pre-receptor enzyme activity controlling tissue-specific GC availability, which can be improved following treatment with DR-HC.

OC2. A Novel Screening Tool for the Prediction of Gestational Diabetes

R D'Arcy[1], IE Cooke[2], DR McCance[1], UM Graham[1]

[1]Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast [2]Department of Obstetrics, Royal Jubilee Maternity Hospital, Belfast

The National Institute of Clinical Excellence (NICE) recommends selecting women for GDM testing on the basis of risk factors: BMI ≥ 30 kg/m^2, previous macrosomia (baby weighing ≥ 4.5 kg), family history of diabetes, high risk ethnicity or previous gestational diabetes mellitus (GDM) (NG3, 2015). These guidelines have been widely adopted within the UK yet the identified risk factors perform poorly as predictors of GDM (positive predictive value (PPV) 20.8%). We sought to assess the performance of ultrasound measured maternal visceral adipose tissue depth (VAD) as a tool for GDM prediction. This is a straightforward assessment which takes around 5 minutes to perform. In a nested observational study, we measured VAD using ultrasonography at < 14 weeks gestation in 123 women identified as having at least one NICE risk factor for GDM. All women underwent a 75g OGTT at 28 weeks' gestation which was analysed using WHO criteria and 26 women (21.1%) developed GDM. Women with GDM had a significantly higher VAD with those without GDM (4.22 ± 0.97 cm vs 3.12 ± 1.33 cm p < 0.01). Using receiver operator characteristic (ROC) curve analysis, a VAD of 3.98 cm achieved a sensitivity of 73.1% and specificity of 72.2% for the later diagnosis of GDM in this cohort. Women exceeding this threshold were at seven-fold greater odds of later GDM diagnosis (OR 7.0). The use of this VAD threshold in this cohort increased PPV to 58.7% with a NPV of 90.9%. Ultrasound measured VAD is an easily performed and effective tool for the prediction of GDM in at-risk pregnancies.

OC3. Use of HbA1c in Predicting Excessive Fetal Growth in Women at Risk of Gestational Diabetes Mellitus

R D'Arcy[1], IE Cooke[2], DR McCance[1], UM Graham[1]

[1]Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast [2]Department of Obstetrics, Royal Jubilee Maternity Hospital, Belfast

Gestational diabetes mellitus (GDM) is associated with excessive fetal growth in later gestation. GDM is diagnosed following 75 g oral glucose tolerance testing (OGTT) which is usually performed between 26-28 weeks' gestation. Subsequent intervention aims to reduce the risk of excessive fetal growth and its associated sequelae. Recent data suggests aberrant fetal growth may begin earlier than 28 weeks. Identifying pregnancies at risk of early fetal growth would enable early intervention. We assessed the use of early pregnancy HbA1c in predicting excessive fetal growth. HbA1c was measured at < 14 weeks gestation in 948 women at risk of GDM. Comprehensive fetal biometry by ultrasound was performed at 28 weeks alongside 75 g OGTT. GDM was defined using WHO criteria. 186 women (19.6%) screened positive for GDM. At the time of OGTT, pregnancies affected by GDM already demonstrated higher adjusted fetal weight percentile than non-GDM pregnancies. (50.9 ± 26.6 (mean ± SD) vs 46.2 ± 25.7 p = 0.02). This was driven by relative increases in the fetal abdominal circumference percentile in GDM pregnancies compared to non-GDM (54.7 ± 24.8 vs 46.2 ± 23.0 p = < 0.01). Early pregnancy HbA1c was higher in the GDM group vs non-GDM; 35.8 ± 4.7 vs 32.9 ± 3.8 p = < 0.01. A threshold for predicting excessive fetal growth was not identified in this cohort. Accelerated fetal growth is evident prior to diagnosis of GDM. These results highlight the need for suitable methods of identification of pregnancies at high risk for early accelerated fetal growth due to GDM.

OC4. Fluid Restriction results in a modest rise in plasma sodium concentration in chronic hyponatraemia due to SIAD; results of a prospective randomised controlled trial

A Garrahy[1], I Galloway[1], AM Hannon[1], R Dineen[1], P O'Kelly[1], WP Tormey[2], MW O'Reilly[1], DJ Williams[3], M Sherlock[1], CJ Thompson[1]

[1]Academic Department of Endocrinology, Beaumont Hospital and RCSI Medical School, Dublin. [2].Department of Chemical Pathology,

Beaumont Hospital, Dublin. [3]. Department of Stroke and Geriatric Medicine, Beaumont Hospital and RCSI Medical School, Dublin.

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OC5. Twenty years' experience of bilateral inferior petrosal sinus sampling (BIPSS) for the differential diagnosis of Cushing's syndrome– the value of a single operator

J Smyth [1], PK Ellis [2], H Wallace [1], UM Graham [1], JR Lindsay [1], H Courtney [1], SJ Hunter [1], D McCance [1], K Mullan[1]

[1]Regional Centre for Endocrinology and Diabetes Royal Victoria Hospital Belfast [2] Imaging Centre, RVH, Belfast

We reviewed the results of BIPSS performed by a single operator in the Regional Endocrine Unit between 2000 and 2019. There were 65 patients, 46 female (71%) and median age 42 years (range 12-73). All had two abnormal diagnostic tests and measurable ACTH levels. Central: peripheral ACTH gradient thresholds were set at > 2.0 basally and > 3.0 post-CRH. The procedure was repeated in one patient because of sample clotting. Stimulation with CRH was performed in 64/66 procedures. There were no associated deaths and one episode of transient atrial fibrillation. Bilateral cannulation was achieved in 62/66 procedures (94%). In the four procedures without bilateral cannulation, all had a diagnostic unilateral gradient and so their results are included. Fifty-seven patients had positive gradients. Of these, 48 had trans-sphenoidal surgery (TSS), two died before surgery; one had bilateral adrenalectomy and six with mild cyclical/intermittent Cushing's were managed conservatively. Post TSS, 40 had biochemical remission and eight required additional treatment: of these, 6/8 had positive histopathology and the remaining 2/8 had suppressed cortisol with dexamethasone testing. Of those with no gradient, four were diagnosed as ectopic ACTH syndrome; one died before further investigation; two underwent successful adrenal surgery and one underwent TSS despite a basal gradient of 1.2. This patient did not have CRH stimulation at BIPSS, had positive imaging, a positive peripheral CRH test and positive histology. In our experience, BIPSS performed with CRH stimulation and by one operator, is safe, technically successful, and influences management in a number of patients.

OC6. The psychosocial impact of frailty among people with diabetes: findings from the Study of Health Aging and Retirement in Europe (SHARE).

MR O'Donovan[1], D Sezgin[2], R O'Caoimh[3,], A Liew[2,4,*].*

[1]HRB Clinical Research Facility Cork, Mercy University Hospital, Cork.[2] College of Medicine, Nursing and Health Sciences, National University of Ireland Galway, Galway.[3] Department of Geriatric Medicine, Mercy University Hospital, Cork.[4] Department of Endocrinology, Portiuncula University Hospital, Ballinasloe.*Co-senior author

Diabetes and its related complications are recognised risk factors for frailty. Frailty, is associated with depression and reduced quality of life (QOL). We hypothesised that the psychosocial impact of frailty is greater among participants with diabetes compared to those without. Data from 21 countries included in the Survey of Health, Ageing and Retirement in Europe were analysed. Depression and QOL were defined using the 12-item EURO-D index (cut-off ≥ 4) and CASP-12 index (cut-off < 35), respectively. Frailty was measured using the frailty phenotype. In total, 12% (11,661 of 97,691) of this cohort had diabetes. Participants with diabetes were more likely to be frail compared to those without diabetes (21% vs. 8%, $p < 0.001$). For participants who were frail, having diabetes was associated with higher mean frailty scores (3.45 vs. 3.39; $p < 0.001$) with significantly more cases of walking difficulties (86% vs. 81%; $p < 0.001$) and reduced grip strength (65% vs. 63%; $p = 0.046$), despite having similar age ($p = 0.314$) and gender ($p = 0.144$) profiles. Participants with diabetes and frailty had higher mean depression scores (5.54 vs. 5.32, $p < 0.001$) and lower QOL scores (29.53 vs. 30.39, $p < 0.001$). Among participants with diabetes, two of the EURO-D components {"sadness" (positive predictive value [PPV] = 70%; negative predictive value [NPV] = 88%) and "fatigue" (PPV = 65%; NPV = 85%)} were particularly useful for screening for depression. Combining these two components increased accuracy (PPV = 86%; NPV = 81%). Participants with diabetes were more likely to be frail, those who were frail were more likely to report lower mood and QOL. This highlights the importance of screening for frailty in routine clinical practice.

OC7. High HDL-cholesterol levels in Type 1 diabetes are not associated with commensurately increased cholesterol efflux capacity

M Ahmed[1], R Byrne[2], I Frizelle[1], W Guo[2], A Gunness[1], KS Ahmed[1], A McGowan[1], K Moore[1], G Boran[2], FC McGillicuddy[3] and J Gibney[1]

[1] Robert Graves Institute, Tallaght University Hospital, D24. [2] Department of Chemical Pathology, Tallaght University Hospital, D24. [3] Diabetes Complications Research Centre, School of Medicine, UCD, D4

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OC8. Endocrine dysfunction after checkpoint inhibitor immunotherapy in the treatment of malignant melanoma: The Northern Ireland Experience

C Hamill[1], A Nugent[1], I Wallace[1], P C Johnston[1], B Oladipo[2]

[1]Department of Endocrinology and Diabetes, Belfast City Hospital, UK[2] Cancer Centre, Department of Oncology, Belfast City Hospital, UK

Background: Immune checkpoint inhibitors (IO) have substantially improved clinical outcomes for patients with malignant melanoma, but with the potential to cause endocrine dysfunction which can impact on outcomes. Aim of Study: To assess the prevalence of endocrine dysfunction (pituitary, adrenal and thyroid) in patients receiving IO for the treatment of malignant melanoma in Northern Ireland. Methods: We evaluated 179 patients with malignant melanoma treated with IO between September 2012 and September 2018 using ipilimumab, pembrolizumab, or nivolumab or in combination. Clinical information was obtained from electronic medical records. Patients on treatment were assessed for endocrine dysfunction at regular intervals (and adrenal/sellar imaging if indicated) according to local protocol, with clinical input and subsequent follow up from endocrinologists. Results: Mean age was 61 years, range (24-86), 49% female, 51/% male. Median follow up was 24 months (range 1 to 60 months). 39% were alive at most recent follow up. 35 patients received Ipilimumab/Nivolumab combination, of which 11 (31%) developed endocrinopathy including 4 (11%) with hypophysitis and 7 (20%) with thyroid dysfunction. 70 patients received Ipilimumab monotherapy of which 14 (20%) developed endocrinopathy including 7 (10%) with hypophysitis and 7 (10%) with thyroid dysfunction. 99 patients received Pembrolizumab of which 5 (5%) developed thyroid dysfunction and no pituitary dysfunction occurred. Recovery of endocrine function was uncommon. Conclusions: Endocrine dysfunction is common in melanoma patients on IO and more common with combination

therapy. This study highlights the importance of screening and having a high index of suspicion for endocrinopathy in these patients.

OC9. Immunohistochemical Analysis of Pituitary Neuroendocrine Tumours in a Tertiary Referral Centre

PB Loughrey[1,2], SG Craig[1], EE Parkes[3], DG McArt[1], SJ Hunter[2], JA James[1,2,4]

[1] Precision Medicine Centre of Excellence, Patrick G Johnston Centre for Cancer Research, Queen's University, Belfast.[2]. Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast Health and Social Care Trust, Belfast.[3]. Department of Oncology, University of Oxford, Oxford. [4]. Northern Ireland Biobank, Patrick G Johnston Centre for Cancer Research, Queen's University, Belfast.

Pituitary neuroendocrine tumours (PitNETs) are common intracranial tumours with widespread heterogeneity. Current recommendations on histopathological evaluation of PitNETs includes an assessment of Ki-67 proliferation index (PI) and immunohistochemical detection of anterior pituitary hormones as a minimum. Ki-67 has been utilized in the histopathological assessment of PitNETs since the 1980s and remains the first line proliferative marker in PitNETs. However, despite reliance on Ki-67 as a prognostic biomarker controversy remains about its clinical value and the recommended cut-off of ≥ 3%. The aim of this study was to perform an anonymized retrospective analysis of histopathological data from resected PitNETs in a tertiary referral centre and subsequently pilot the utility of QuPath digital image analysis software in Ki-67 PI assessment. We present available histopathological data on anterior pituitary hormone expression in 271 PitNET samples resected between January 2011 and August 2019. Using Northern Ireland Biobank infrastructure 196 MIB1 antibody stained whole face sections completed as standard best care were subsequently retrieved, scanned and digital images then examined using QuPath digital image analysis software. Hormone negative PitNETs (n = 111) were the most common resected PitNET by immunohistochemical analysis, while thyrotropinoma was least common (n = 5). QuPath software was successfully used to identify PitNET cells and calculate Ki-67 PI. An inverse relationship was found between cell count and Ki-67 PI which may impact Ki-67 cut-offs. This highlights the importance of standardized approaches to Ki-67 assessment and we propose that digital image analysis strategies will have a role in complimenting expert neuropathological evaluation of PitNETs in the future.

OC10. Health service use and associated costs attributable to diabetes in the Mitchelstown Cohort Study

PT Walsh[1], KN O'Neill[2], PM Kearney[2]

[1] School of Medicine, University College Cork, Cork [2] School of Public Health, University College Cork, Cork

The number of people with diabetes is increasing globally and with evidence of rising medical expenditure per person, the growth in economic burden will continue. Accurate cost of illness estimates are needed to inform national policy and identify potential cost savings. This study aims to estimate health service use and costs attributable to diabetes. A sample of middle-aged adults (≥ 50 years) from the Mitchelstown cohort study, collected between 2016-2017 was analysed. Diabetes was defined using self-report doctor-diagnosis, HbA1c and fasting plasma glucose levels. Health service use in the previous 12-months included; number of general practitioner (GP) visits, emergency department visits, hospital admissions, outpatient visits, and day procedures. Multivariable negative binomial regression was used to estimate the association between diabetes and frequency of visits. Frequency of visits was applied to unit costs for each health service, calculating mean costs per person with and without diabetes. Of 1,332 patients analysed, prevalence of diabetes was 10.4% (95%CI: 8.9, 12.2) [diagnosed 7.4% (95%CI: 6.1, 8.9), undiagnosed 3.1% (95%CI: 2.3, 4.2)]. Diabetes was associated with a 49% increase in GP visits. Diabetes was not associated with additional hospital admissions, emergency department visits, outpatient visits or day procedures. The annual mean cost of health service use among those with diabetes was €1,597.80 per person compared with €1,352.67 for those without. While diabetes was associated with additional GP visits, it was not associated with additional service use in secondary care. Structured diabetes management in primary care may contribute to reduced health service use and costs attributable to diabetes.

OC11. The Prevalence of Adrenal Insufficiency in the Irish Kidney Transplant Recipient Population

M Tomkins [1,2], J Martin-Grace [1,2], C Kennedy [1], O Mc Enroe [3], K Heverin [4], S Srinivasan [4], P Conlon [2,3], D De Freitas [2,3], M Denton [2,3], C Magee [2,3], C O'Seaghdha [2,3], M O'Reilly [1,2], CJ Thompson [1,2], M Sherlock[1,2]

[1]Academic Dept of Endocrinology, Beaumont Hospital, Dublin 9 [2] Royal College of Surgeons in Ireland[3] Dept of Nephrology and Kidney Transplantation, Beaumont Hospital, Dublin 9 [4] Dept of Chemical Pathology, Beaumont Hospital, Dublin 9

Kidney transplant recipients (KTR) receive glucocorticoids as maintenance immunosuppression. However, assessment of adrenal function and steroid education do not feature in clinical practice guidelines for KTR. This study aims to investigate the prevalence of adrenal insufficiency (AI) in KTR on maintenance prednisolone, and whether AI predicts adverse cardiometabolic risk. KTR underwent a short synacthen test (SST, Roche Elecsys II immunoassay, pass cortisol > 430 nmol/l) and an assessment of metabolic health. 55 participants were recruited, with a median age of 51 yrs (IQR 39-63) and median duration of glucocorticoid therapy since transplantation of 8 years (IQR 5-22.5 yrs). 74.5% (41/55) of participants failed the SST. Participants with AI had lower morning cortisol concentration than those without AI (148 vs. 322 nmol/l, $p < 0.001$), and a two-fold greater cumulative prednisolone exposure (median 249 vs. 120.5 mg/kg prednisolone, $p = 0.115$). 91% (50/55) take 5mg prednisolone daily, 9% (5/55) take 5mg prednisolone on alternate days. 80% (4/5) of those receiving alternate day dosing passed the SST. There were no significant differences in cardiometabolic risk between the groups. A basal cortisol of > 294 nmol/l predicted a pass SST result with 100% specificity (95% CI 91-100%, $p < 0.001$). Only 14.5% of participants had knowledge of glucocorticoid sick day rules. No patient carried a medic-alert bracelet or steroid card. Our results suggest KTR are at higher risk for AI than previously reported, highlighting a need for greater patient and physician awareness regarding AI.

OC12. Blue whiting (Micromesistius poutassou) protein hydrolysates affect glycaemic control and appetite in healthy mice, dependent on hydrolysis method.

SJ Sharkey[1], RA. Lafferty[1], PA. Harnedy-Rothwell[2], S Gite[3], J Whooley[3], RJ FitzGerald[2], FPM O'Harte[1]

[1]Diabetes Research Group, School of Biomedical Sciences, Ulster University, Coleraine, Co. Derry. BT52 1SA.[2] School of Biological

Sciences, University of Limerick, Castletroy, Limerick, Ireland. [3] Bio-marine Ingredients Ireland, Lough Egish Food Park, Co. Monaghan, Ireland.

Rates of T2DM and obesity are increasing exponentially (Cho et al, 2018). Dietary protein has been shown to play an important role in glycaemic and appetite control (Leidy et al, 2012; Manders et al, 2014). Globally, protein is in high demand and blue whiting protein hydrolysates represent an attractive option. This study generated 6 different enzymatic hydrolysates (BW-SPH-90A-F) of blue whiting on an industrial scale. Hydrolysates were characterised through degree of hydrolysis (DH), molecular mass determination, and total/free amino acid content. Following this, their acute effects on glycaemic control ($n = 16$) and food intake ($n = 8$) was assessed, as were their effect on these parameters when given 2 h prior to experimentation ($n = 8$). BW-SPH-90-B exhibited the highest DH, while BW-SPH-90-A had the highest proportion of peptide components with molecular mass < 1 kDa. BW-SPH-90-A showed food intake reductions versus controls ($P < 0.05$) at 100 mg/kg (24.3%) and 75 mg/kg (16.5%; $p < 0.05$). BW-SPH-90-C showed a 24.6% reduction in blood glucose $AUC_{(0\text{-}120\ min)}$ ($p < 0.05$) and a 23.5% reduction ($p < 0.05$) 30 min after glucose challenge versus a glucose-only control. The similarity in amino acid profiles, despite significant variation in DH, indicates that the bioactivity found is likely dependent on peptide structure rather than amino acid profile. Further work is required to characterise the peptide profile of the two most promising hydrolysates. In conclusion, the resultant bioactivity is affected by the hydrolysis method employed and certain blue whiting protein hydrolysates show significant potential for a functional food application for management of T2DM and obesity.

References: Cho, N.H.; Shaw, J.E.; Karuranga, S.; Huang, Y.; da Rocha Fernandes, J.D.; Ohlrogge, A.W.; Malanda, B. (2018) IDF Diabetes Atlas: Global estimates of diabetes prevalence for 2017 and projections for 2045, Diabetes Research & Clinical Practice, 138, 271 – 281. Leidy, H.J., Tang, M., Armstrong, C.L., Martin, C.B., Campbell, W.W. (2011) The effects of consuming frequent, higher protein meals on appetite and satiety during weight loss in overweight/obese men. Obesity, 19 (4), 818-824. 10.1038/oby.2010.203. Manders, R. J. F., Hansen, D., Zorenc, A. H. G., Dendale, P., Kloek, J., Saris, W. H. M., van Loon, L. J. C. (2014) Protein co-ingestion strongly increases postprandial insulin secretion in type 2 diabetes patients, Journal of Medicinal Food, 17 (7), 758 – 763.

OC13. Is there an atherogenic lipoprotein phenotype in Type 1 diabetes?

I Frizelle[1], R Byrne[2], M Ahmed[1], W Guo[2], A Gunness[1], KS Ahmed[1], A McGowan[1], K Moore[1], V Maher[1], G Boran[2], FC McGillicuddy[3] and J Gibney[1]

[1]Robert Graves Institute, Tallaght University Hospital, D24[2] Department of Chemical Pathology, Tallaght University Hospital, D24[3] Diabetes Complications Research Centre, School of Medicine, UCD, D4

Atherosclerosis risk and cardiovascular mortality remain increased in type 1 diabetes (T1DM) despite an apparently protective lipid profile. It is not known whether more complex measures of lipoprotein structure and function are associated with atherosclerosis in T1DM. We measured carotid intima-media thickness (CIMT) in 254 T1DM participants. Z-scores (standard-deviation from the predicted value) for age and gender were derived from 200 controls without cardiovascular risk factors. T1DM subjects were divided equally into those with Z-scores above (CIMT+) and below (CIMT-) the T1DM median. Lipid profile, lipoprotein-particle size (nuclear-magnetic-resonance) and HDL-CEC (^{3}H-cholesterol efflux from J774-macrophages to HDL) were compared between the two groups. Mean (SD) CIMT was 0.62(0.09)mm in the CIMT+ group and 0.55(0.06)mm in the CIMT- group. There were no statistically significant between- group differences in age, gender, diabetes duration, blood pressure, HbA1c or LDL-cholesterol. Compared to CIMT- participants, the CIMT+ group had greater plasma triglycerides (1.39(0.93) vs 1.15(0.81)mg/dL, VLDL and chylomicron particle number 38.86(21.08) vs 32.8(16.74)nmol/L, LDL particle number 909.27(308.65) vs 810.68(235.60)nmol/L and small VLDL number 28.83(17.05) vs 24.07(13.30)nmol/L; HDL-C levels were greater in the CIMT- group 1.70(0.45) vs 1.56(0.47)mmol/L ($P < 0.05$ for all). Trends were observed towards greater waist-hip-ratio 0.86(0.09) vs 0.84(0.09) and (large) HDL particle size 10.01(4.20) vs 9.06(4.60)μmol/L in the CIMT+ group. More severe atherosclerosis in T1DM is associated with a phenotype of central adiposity, higher VLDL, chylomicron and LDL particles, hypertrigyceridaemia and low HDL-C. Classical cardiovascular risk factors appear less important. Strategies to modify these variables might help reduce progression of atherosclerosis in T1DM.

OC14. A novel acylated apelin-13 analogue shows benefits on pancreatic islet cell turnover and transdifferentiation in two diabetic animal models.

FPM O'Harte[1], N Tandy[1], N Irwin[1], RC Moffett[1] and PR Flatt[1]

[1]Diabetes Research Group, School of Biomedical Sciences, Ulster University, Cromore Road, Coleraine, Northern Ireland BT52 1SA

Apelin-13 analogues have been shown to have positive therapeutic effects in diabetes. Here we examined potential pancreatic benefits of repeated apelin analogue treatment in both streptozotocin (STZ) and high-fat fed, diet-induced obese (DIO) diabetic mouse models. Islet cell apoptosis, proliferation and transdifferentiation were examined using $Ins1^{Cre/+}$;Rosa26-eYFP transgenic mice and in STZ- and DIO-treated mice. Groups ($n = 6$-8) of STZ-induced and DIO-induced diabetic mice received once-daily injection (25 nmol/kg) of the long-acting acylated apelin-13 analogue, pGlu(Lys^8Glu-PAL)apelin-13 amide, for 10 or 12 days, respectively. pGlu(Lys^8 Glu-PAL)apelin-13 amide treatment partly reversed STZ-induced body weight loss and normalized circulating insulin. In contrast, these variables were not altered in DIO diabetic mice, but an increase in pancreatic insulin content was observed. Apelin analogue treatment also fully, or partially, reversed the detrimental effects in STZ and high-fat feeding in mice on plasma and pancreatic glucagon concentrations, respectively. In DIO mice, the acylated apelin analogue decreased dietary-induced elevations of islet, β- and α-cell areas ($P < 0.05$-$P < 0.01$), whilst reducing α-cell area in STZ-induced diabetic mice. In terms of islet cell lineage, pGlu(Lys^8 Glu-PAL)apelin-13 amide effectively reduced β- to α-cell transdifferentiation in STZ-induced diabetic mice and helped maintain β-cell identity, which was linked to elevated Pdx-1 expression ($P < 0.001$). These islet effects were coupled with decreased β-cell apoptosis and α-cell proliferation in both diabetic models, and there was an accompanying increase of β-cell proliferation in STZ-induced diabetic mice. Overall, antidiabetic pancreatic islet benefits of sustained APJ receptor activation are linked to favourable islet cell morphology, leading to maintenance of β-cell mass.

Abstracts: Invited poster presentations

CASE REPORTS

P1. A case of Thyrotoxic Periodic Paralysis (TPP) as a first presentation of Graves' Disease.

S Ludgate [1,2], D Fennell [1], KW Ho [2]

[1]Department of Endocrinology, Mater Misericordiae University Hospital, Dublin

[2]Department of Diabetes and Endocrinology, Ryde Hospital, Sydney, NSW, Australia

TPP is characterised by acute onset hypokalaemia and paralysis and most commonly affects men of Asian descent between the ages of 20-40 years. It is rare, reported in approximately 2% of thyrotoxicosis patients in China and Japan. Hypokalaemia in TPP results from a massive intracellular shift of potassium induced by the thyroid hormone sensitisation of Na^+/K^+–ATPase. Treatment of TPP includes prevention of this potassium shift by using beta-blockade, rapid potassium replacement and treatment of underlying hyperthyroidism. We present the case of a 21-year-old Malaysian gentleman who presented to ED having awoken from sleep with new onset bilateral lower limb paralysis. On admission, serum potassium was found to be 1.9 mmol/L (3.5-5.0). He underwent immediate IV potassium replacement. Examination showed sinus tachycardia and bilateral hand tremor with no thyroid eye disease. A diagnosis of Graves' hyperthyroidism was made (TSH < 0.004 mIU/L (0.4-4.5), FT4 60 pmol/L (9-23), FT3 > 46.1 pmol/L (2.3-5.5), TSH receptor antibody 19.0 IU/L (< 1.8)). He was commenced on carbimazole 15 mg BD and propranolol 20 mg BD. Two weeks post discharge his carbimazole dose was increased to 20 mg BD. He initially required oral potassium supplementation which was ceased with resolution of the hyperthyroidism. He had full recovery of his lower limb paralysis. He is currently euthyroid on 10 mg carbimazole OD 15 months post presentation and definitive treatment is being considered. This case highlights the importance of prompt recognition of this rare life-threatening complication of Graves' disease, especially in Asian patients.

P2. Primary adrenal lymphoma presenting with symptomatic hypercalcaemia

H Forde [1], J Noble [1], D Gibbons [2], J Holian [3], G Connaghan [4], RK Crowley [1].

Department of Endocrinology[1], Pathology[2], Nephrology[3], Haematology[4]St. Vincent's University Hospital, Elm Park, Dublin 4.

There are approximately 250 cases of primary adrenal lymphoma (PAL) reported in the literature to date. We report the case of a male, who presented to the emergency department with symptomatic hypercalcaemia and was subsequently diagnosed with PAL complicated by adrenal insufficiency. A 66 year old male, originally from the Philippines, was referred to the emergency department with nausea, vomiting, weight loss and right flank pain. His past medical history was significant for hypertension, gout and stage 3b chronic kidney disease. On examination he was hypertensive and hyperpigmented. Laboratory investigations revealed a corrected calcium of 3.79 mmol/l (2.2-2.6), undetectable parathyroid hormone (PTH), vitamin D 49 nmol/l. He was treated with intravenous (IV) 0.9% saline followed by IV zoledronic acid. Computerised tomography of the thorax, abdomen and pelvis (CT TAP) as well as a positron emission tomography (PET) scan was performed to look for malignancy. These demonstrated bilateral metabolically active adrenal masses with no evidence of extra-adrenal disease. There were no radiological features suggestive of adrenocortical carcinoma (ACC) or phaeochromocytoma and subsequent biochemical investigations confirmed no evidence of endocrine excess. Adrenocorticotrophic hormone (ACTH) levels were elevated however, and a synacthen test revealed inadequate adrenal reserve (peak cortisol 214 nmol/l). The patient was commenced on replacement steroids and proceeded to adrenal biopsy. Histology confirmed diffuse large B cell non-Hodgkin's lymphoma (NHL) and he underwent treatment with R-CHOP regime (rituximab, cyclophosphamide, doxorubicin, vincristine, prednisolone). Follow-up PET scan demonstrated complete radiological response.

P3. Dual paraneoplastic antidiuretic hormone (ADH) and adrenocorticotropic hormone (ACTH) secretion in a patient with small cell bladder carcinoma

RM Tudor[1], N Phelan[1], ML Healy[1],A Pazderska[1]

[1]Department of Endocrinology St. James's Hospital Dublin

Context: Bladder small cell carcinoma (SCC) is a rare clinical entity, exceptionally associated with paraneoplastic syndromes. We present a case of dual paraneoplastic sequential antidiuretic hormone (ADH)/adrenocorticotropic hormone (ACTH) secretion in a patient with bladder SCC. Case illustration: A 77 year old female was admitted with headaches, nausea and poor concentration. She was neurologically intact, clinically euvolemic and met diagnostic criteria for syndrome of inappropriate ADH secretion (SIAD): plasma sodium 116 (normal 135-145 mmol/L), plasma osmolality 246 mOsm/kg, urine osmolality 305 mOsm/kg, urine sodium of 79 mmol/L, TSH 1.77 mU/L (normal: 0.27-4.2), AM cortisol 321 nmol/L. CT imaging revealed a primary bladder tumour with liver and bony metastases. Histology was consistent with a diagnosis of small cell carcinoma. The patient had tumour debulking and chemotherapy (Carboplatin/Etoposide). SIAD was managed with fluid restriction and Demeclocycline. Two months following the initial diagnosis, the patient developed severe hypertension, persistent hypokalemia and metabolic alkalosis, which prompted investigations for hypercortisolism. Laboratory results were consistent with ACTH-dependent Cushing's: 1 mg dexamethasone suppression test: AM cortisol 1696 nmol/L, ACTH 126 pg/ml (normal: 7.2-63.3), 8 mg dexamethasone suppression test: AM cortisol 1537 nmol/L, ACTH 139 pg/ml. MRI pituitary was normal. The patient was treated with Methyrapone. Her SCC progressed despite chemotherapy, clinical status rapidly deteriorated and she passed away in hospice care. Discussion: SCC can acquire mutations and subsequently switch from one neuroendocrine secretion to another. This results in dual paraneoplastic syndromes - exceptionally rare clinical entities, potentially posing diagnostic and therapeutic challenges.

P4. A Conundrum of Unusual Thyroid Function Tests. A Story of Familial Dysalbuminaemic Hyperthyroxinaemia.

J Smyth [1], S Hunter [1]

[1]Regional Centre for Endocrinology and Diabetes Royal Victoria Hospital Belfast

A 15 year old male was referred to surgery for investigation of diarrhoea and inability to gain weight. Thyroid function tests showed FT4: 25.5 pmol/L, TSH: 1.39 mU/L (Roche Cobas). He was referred to Endocrinology for management of hyperthyroidism. He denied heat intolerance, tremor or palpitations. His mother's TFTs were normal, estranged from his father although there was a suggestion of thyroid disease in his father and paternal half-brother. Examination: BMI 14.1 kg/m^2. Clinically euthyroid with no goitre or evidence of thyroid eye disease. Investigations: TFTs by another method (Abbott Architect) showed a similar pattern excluding antibody interference. T3 suppression test, TRH test, MRI pituitary, and THR Beta gene testing excluded Thyroid Hormone Resistance and

TSH secreting pituitary adenoma. Later his 10 y old half-brother was found to have a similar pattern of TFTs. Further testing demonstrated elevated Total T4 300 nmol/l (69-141) but normal levels of TBG 20.6 μg/ml (14-31). ALB gene sequencing revealed a heterozygous Arg242His mutation confirming a diagnosis of FDH. Familial Dysalbuminaemic Hyperthyroxinaemia (FDH) is an autosomal dominant condition, characterized by abnormal circulating albumin with increased T4 affinity, causing artefactual elevation of FT4 concentrations in euthyroid individuals. This case displays a comprehensive testing algorithm used to diagnose FDH as a cause of hyperthyroxinaemia. It illustrates the importance of persisting with investigations to avoid misdiagnosis, potentially harmful treatment or unnecessary follow up. The frequency of FDH is 1 in 10000 individuals compared with 1 in 40000 for THR suggesting that investigation for FDH should occur earlier in the pathway.

P5. Glucose-6-phosphate-dehydrogenase deficiency unmasked by COVID-19 associated DKA and Sulphonylurea use in a patient with ketosis-prone diabetes

E Ali[1], J Brazil[1], G Boran[1], A McGowan[1],J Gibney [1]

[1]Robert Graves Institute of Endocrinology, Tallaght University Hospital, Dublin 24

A 57 year old Nigerian man presented in March 2020 with COVID-19 pneumonia and diabetic ketoacidosis (DKA); blood glucose, ketones and bicarbonate 20.3 mmol/L, 6.1 and 16 mmol/l respectively and pH 7.27. Diabetes was diagnosed 17 years previously; prior records were unavailable. HbA1c was 61 mmol/mol on Metformin/Sitagliptin. He described a "coma" 13 years earlier. DKA was managed according to local protocol, and he recovered quickly from this. COVID-19 pneumonia was treated with Ceftriaxone, Hydroxychloroquine and Azithromycin. Oxygen requirements were significant but he did not require intubation. It was considered likely that he had ketosis-prone diabetes. As he recovered, he was changed from intravenous insulin to Gliclazide and basal-bolus insulin, maintaining good glycaemic control. Recovery was complicated by progressive anaemia; haemoglobin decreased from 12.4 to 7.4 (normal 11.5-16.5) g/dl over 6 days; requiring transfusion of RCC-1 unit. LDH levels were 1556 (normal < 20) U/l, reticulocytes normal, and direct Coombs test negative. "Hemi-ghost cells", characteristic of G6PD deficiency were seen on blood film; subsequently G6PD levels were confirmed to be low 2.8 (5.2-11.5) IU/gHb. Gliclazide was discontinued with normalization of haemoglobin levels. A diagnosis of ketosis-prone diabetes presenting as DKA precipitated by COVID-19 was made, which was complicated by hemolytic anaemia due to G6PD deficiency likely unmasked by infection and sulfonylurea treatment. Reference: Sobngwi E et al. High prevalence of glucose-6-phosphate dehydrogenase deficiency without gene mutation suggests a novel genetic mechanism predisposing to ketosis-prone diabetes. *J Clin Endocrinol Metab. 2005 Aug;90(8):4446-51*

AUDITS/CASE SERIES

P6. An Irish National Diabetes in Pregnancy Audit Report 2016-2018: Aiming for better outcomes for women with pre-gestational diabetes.

C Newman[1], AM Egan[1], L Carmody[1], B Kirwan[1], F Dunne[1] on behalf of the National Diabetes in Pregnancy Audit Working Group

[1]National University of Ireland, Galway, Republic of Ireland

Pre-gestational diabetes mellitus (PGDM) is well established to increase the risk of adverse pregnancy outcomes for both mother and infant. Good glycaemic control at conception can reduce the rate of maternal and perinatal complications. Prior to 2015 there was no national data available on the number or outcomes of these pregnancies in the Republic of Ireland. We aim to accurately record the number of pregnancies affected by PGDM and to report on the outcome. Each of the 20 centers offering care to women with PGDM was invited to participate in this study. Eighteen centers provided data for 679 pregnancies with a delivery date between 1/1/2016-31/12/2018. In total 413 women with type 1 diabetes (T1DM), 244 women with T2DM and 22 "other" forms were included. The average Haemoglobin A1c (HbA1c) at conception was 61.6 ± 19 mmol/mol and 54.8 ± 17.6 mmol/mol for patients with T1DM and T2DM respectively. Deficits in care were identified in the areas of pre-pregnancy clinic attendance (31.8%) and folic acid use in (51%). The majority of pregnancies (83.5%) resulted in a livebirth. A total of 53.6% of patients underwent caesarean section and 46.7% infants were classified as Large for Gestational Age. The perinatal mortality rate (PNM), congenital anomaly and stillbirth rates were all higher than those observed in the background population at 10.6 per 1000, 48.4 per 1000 and 5.8 per 1000 respectively. The results of our second national audit identify persistent adverse outcomes for patients however multiple potential targets for improvements were identified in both the pre- and ante-natal periods.

P7. The Natural History of Clinically Non-functioning Pituitary macroadenomas (NFPAs) managed conservatively

L Cussen[1], K Burke[1], M Javadpour[2], A Agha[1]

[1]Department of Endocrinology, Beaumont Hospital and RCSI[2]Department of Neurosurgery, Beaumont Hospital and RSCI* A Agha and M Javadpour contributed equally to the study

Transsphenoidal surgery is the treatment of choice for clinically NFPAs, causing visual or pressure symptoms. There is a paucity of data, however, on conservatively managed NFPAs. We aimed to study the rate of progression of these tumours in the absence of surgical management. We evaluated clinical, biochemical and imaging data on 54 patients managed at the National Neurosurgery/ Pituitary Centre in Beaumont Hospital, from 2016 – 2020. The median age of presentation was 54 years (range 17-80 years), 53% were male. All NFPA measured over 1 cm, with suprasellar extension in 90% and parasellar extension in 50%. The median duration of follow up is four years (range 0.5-30 years). Seventy-four percent of patients (n = 40) had progression of disease, median time to progression on imaging was 15 months (range 2-74 months). Progression was characterised by symptoms in 10% (n = 4), visual field deterioration in 32.5% (n = 13), radiological progression in 57.5% (n = 23), and 22.5% (n = 9) had two features. Progression was associated with higher rates of pituitary insufficiency (p = 0.0124); there was no statistical difference in size or features of aggression on imaging. Sixty-two percent (n = 34) of patients underwent surgery with visual impairment being the most common indication. Long-term postoperative outcomes (n=34) included hypopituitarism 73% (n = 25), radiotherapy 38% (n = 13) and radiological recurrence 35% (n = 12). In the conservative group (n = 20), 30% (n = 6) had hypopituitarism. In this cohort, the majority of the patients progressed. Patients with pituitary dysfunction warrant careful surveillance. Diagnosis or evidence of parasellar invasion did not predict progression; however, the numbers are relatively small, and the median follow-up is short.

P8. A retrospective review of outcomes after pituitary apoplexy in a tertiary pituitary centre

I.Galloway[1], E. Reece [1], M.Tomkins [1], A. Garrahy [1], J. Martin-Grace [1], P. Logan [3], D. O'Brien [2], D. Rawluk [2], M. Javadpour [2], M. O'Reilly [1,4], A. Agha [1], M. Sherlock [1,4] and C.J. Thompson [1,4]

[1]Academic Department of Endocrinology, Beaumont Hospital, Dublin [2]Department of Neurosurgery, Beaumont Hospital, Dublin[3]Department of Neuro-ophthalmology, Beaumont Hospital, Dublin. [4]Academic Dept of Endocrinology, RCSI Medical School, Dublin

Pituitary apoplexy occurs as a result of haemorrhage and/or infarction of the pituitary gland. Classical pituitary apoplexy presents as a spectrum of endocrine and neurosurgical abnormalities, with acute onset of hypopituitarism and neurosurgical sequelae. There is a lack of consensus on optimal management of this rare endocrine condition. The aim of our study was to assess differences in long-term endocrine, neuro-ophthalmic and tumour outcomes of patients managed either surgically or conservatively. We present data from the largest cohort of patients with classical pituitary apoplexy, including both surgically and conservatively managed patients, in the literature. 104 episodes of apoplexy were identified in 103 patients; 65 episodes were managed surgically and 39 conservatively. For analysis, the group was split into conservatively and surgically managed cohorts. There was no difference in gender or age between the two groups. At presentation, the surgical group had more severe and a higher incidence of neuroophthalmological abnormalities (61.5% vs. 10.2%, $p < 0.0001$). On follow up, 45% of patients managed surgically had improvement/normalisation of visual fields. In the conservative group, four patients had a visual field (VF) defect at presentation (all only mild superior quadrantinopias) and there was no progression in the VF defect on follow up. At last follow up, there were higher rates of hypocortisolism and diabetes insipidus in the surgical group (80.4% vs. 47.4% $p = 0.002$ and 31.1% vs 12.8% $p = 0.05$, respectively). Conservative management in carefully selected patients was associated with no deterioration in mild VF defects and showed potential reversibility of hypocortisolism during long-term follow up.

P9. An audit of the screening and management of dyslipidaemia in a regional paediatric type 1 diabetes population

N.P. Dalton[1], S.T. O'Brien[1], T. Martin[1], T. Dunne[1], R. Power[1], C.S. O'Gorman[1], O.M. Neylon[1]

[1]Department of Paediatrics, University Hospital Limerick, Dooradoyle Limerick

Individuals with Type 1 Diabetes have a significantly increased risk of morbidity and mortality from cardiovascular disease compared to the general population. Onset of atherosclerosis has been demonstrated in childhood, with cholesterol deposition playing an important role in atherosclerosis initiation. The ISPAD guidelines were refined in 2018 and describe current recommendations for the management of dyslipidaemia in a paediatric type 1 diabetes population. We aimed to audit dyslipidaemia screening and management in our paediatric Type 1 Diabetes population compared with ISPAD guidelines. Data were collected prospectively on all paediatric type 1 diabetes patients in the service over a period of three years (n = 235). We measured the proportion of patients who were appropriately screened for dyslipidaemia based on age or family history. We also calculated the mean delta LDL for our patients with hypercholesterolaemia. We then compared our management of these patient with ISPAD guidelines on dyslipidaemia. Of our cohort of 235, 166 were aged ≥ 11 years. Of these, LDL was measured in 115 (69%). Fourteen (8%) had total cholesterol measured without LDL, while 37 (21%) had no lipids checked. 48 patients met the criteria for referral to a dietician for specific cholesterol education, however, only 13 patients underwent this counselling. Following a trial of diet and exercise, eleven adolescents met criteria for treatment with a statin however none are currently on treatment. Our audit suggests that the screening and management of dyslipidaemia is suboptimal in our population. We aim to introduce several quality improvement measures prior to re-auditing.

P10. Multi-Centre Real-World Data on FreeStyle Libre in the Republic of Ireland

L Cussen [1], E McGee [1], D McDonnell [1], O Kgosidialwa [1], R Davern [2], E O'Sullivan [2], Casey C[3], A Tuthill [3], F Dunne [2], D Smith [1]

[1].Endocrinology Department, Beaumont Hospital, Dublin and RCSI[2]. Endocrinology Department, Galway University Hospital and NUIG[3]. Endocrinology Department, Cork University Hospital and UCC

FreeStyle Libre (FSL) is a flash glucose monitoring system which measures interstitial glucose. It has been shown in patients with T1DM to improve diabetes control, reduce time in and frequency of hypoglycaemia. In Ireland, the funding of FSL is restricted to patients with T1DM under 21 years of age or with exceptional circumstances. Irish data on the benefit of FSL is limited. We, therefore, performed a national multicentre audit of FSL in patients before and six months after starting FSL. The audit tool was standardised across three sites and was based on the UK ABCD audit. HbA1c was calculated based on the 3 most recent pre FSL used and an average of HbA1c after 6 months of FSL usage. Eighty-five patients were included with a mean age of 21 years (± 10.5), a mean diabetes duration of 12 years (± 7.9), and 52% were male (mean [±SD]). Sixty-six patients were on multiple daily injections, and 19 on CSII therapy. HbA1c dropped from 70 mmol/mol (± 19.2) to 69 mmol/mol (± 15.8). Gold score improved from 3 to 2. Hypoglycaemia recognition changed from 3.8 to 4.1mmol/l. Severe diabetes distress was reduced, pre-FSL19 patients reported feeling overwhelmed by the demands of living with diabetes compared to 2 patients post-FSL. User satisfaction was high, with a score of 8 out of 9. Mean daily scans were 8, and 15 patients self-funded. This multicentre audit on the use of FSL showed multiple benefits for Irish patients with T1DM and supports increased access for patients to flash glucose monitoring.

Abstracts: Poster Presentations

Adrenal/Pituitary/Thyroid

P11. Imprecise timing and failure to interrupt steroid administration are common reasons for incorrect performance of inpatient short synacthen tests.

A McCarthy[1], S McKenna[2], K Hall[2], A Niland[2], G Boran[2], C Moran[2]

[1]UCD School of Medicine, UCD, Dublin 4 [2] Beacon Hospital, Dublin

Introduction: The short synacthen test (SST) is commonly used to assess adrenal function. Accurate timing and appropriate holding of exogenous steroids are essential to ensure correct interpretation of results. Aims & methods: We reviewed all SSTs performed on inpatients at the Beacon Hospital over a 1-year period to determine accuracy of testing. Results: 42 patients (Male 15, Female 27), with mean age 68 years (range 43-90), underwent SST. The

majority (88%) of tests were requested by medical teams. The indications for testing were suspected adrenal insufficiency (18), HPA axis suppression (9), fatigue (7), hyponatremia (5), suspected pituitary disease (2) and vomiting (1). 7 (44%) of the 16 patients taking steroids did not have medication appropriately held. 11 (26%) patients had serum ACTH measured prior to the test. 14 (33%) tests were started at the correct time. 10 (24%) of the 30 mins samples were completed within the 25-35 min sample window. The mean time between the 0 min and 30 min samples was 42 mins (median 62 mins; range 0-209 mins). 12 (29%) tests involved an unnecessary 60 min sample. 8 tests had no interpretation of results documented in the medical notes. 4 patients underwent repeat testing, necessitated by an incorrect first test. Discussion: The majority of SSTs (33/42;79%) were completed incorrectly with the most common issues pertaining to incorrect timing of the test. Considering this, some results may have been interpreted incorrectly. Improved training and guidelines for performing SSTs should be available to hospital staff to ensure more accurate application of the test.

P12. Experience of laparoscopic surgery for phaeochromocytoma and paraganglioma in a single centre

MS Ahmed[1], E Ali[1], A Pazderska[3], A McGowan[1], LA Behan[1], KC Conlon[2], J Gibney[1]

Robert Graves Institute of Endocrinology[1] and Professorial Surgical Unit[2], Tallaght University Hospital, Dublin 24, Ireland. Department of Endocrinology[3], St. James's Hospital, Dublin 8, Ireland

Laparoscopic adrenalectomy has improved the surgical treatment of phaeochromocytoma and paraganglioma (PPGL); international series have reported excellent outcomes with reduced perioperative complications and average length of stay (ALOS). This retrospective study was carried out to review perioperative management of PPGLs and their outcome in a single centre between 2000 and 2020. Medical records of fifty-four cases of PPGL were retrospectively reviewed. Of forty-four patients (mean-age 56 (range 16-82) years; twenty-three female) who met inclusion criteria, thirty-seven had phaeochromocytoma and seven paraganglioma. Twenty-one (46.7%) had clinical features of headache (57%), hypertension (42.8%), sweating (28.6%) or palpitations (28.6%). Mean preoperative inpatient duration was 6 days during which alpha-blockade was achieved with Phenoxybenzamine (mean-daily-dose 1.5mg/kg/day), and volume expansion with intravenous fluids (mean-daily-volume 3L). Propranolol was used in 3 patients with symptomatic reflex tachycardia. 33 patients underwent laparoscopic, and 11 open (one converted from laparoscopic) adrenalectomy; one underwent transurethral resection of bladder paraganglioma. Overall ALOS was 19 days, and for open adrenalectomy 21 days. Mean(±SD) intraoperative BP was 116 ± 14/64 ± 7 mmHg and mean HR 73 bpm. Fourteen became significantly hypertensive (BP > 180/110), only one between 2015 and 2020. Postoperatively, four (8.9%) became transiently hypotensive and seven (15.6%) transiently tachycardic. Two developed pulmonary embolism. There were no deaths. Hypertension was permanently cured in thirteen (50%) of hypertensive patients. Due to COVID-19, recent patients have been admitted 2 days pre-operatively following outpatient alpha-blockade; outcomes have been similar. In patients with PPGLs, excellent outcomes are achieved with laparoscopic adrenalectomy carried out in a multi-disciplinary setting with appropriate pre- and peri-operative management; changes made out of necessity during COVID-19 indicate that shorter pre-operative admissions are achievable.

P13. Plasma IGF-1 concentrations at diagnosis and post-treatment in patients with prolactinomas

AM Hannon[1], S Minnock[1], G Boran[1], A McGowan[1], LA Behan[1], J Gibney[1]

[1]Robert Graves Institute of Endocrinology, Tallaght University Hospital

We previously reported a small series of male prolactinoma patients in whom increased IGF-I levels were unmasked following commencement of dopamine-agonist treatment. We hypothesised that this was due to the effect of testosterone to enhance growth hormone stimulation of IGF-I following correction of hypogonadism. A subsequent case-series reported similar observations (1). This retrospective study was carried out to determine the prevalence of increased IGF-1 levels in patients with prolactinoma/presumed prolactinoma (excluded if acromegaly was the presenting diagnosis). We reviewed case-notes of 77 (61F;16M) consecutive patients; median age 32.8 (IQR 24-43) years; 25 macroprolactinoma, 38 microprolactinoma, 14 normal MRI-pituitary; median prolactin at diagnosis 1925(865-4818) mIU/L. Seventy-three/77 (94.8%) were treated with Cabergoline. Plasma IGF-1 was measured at diagnosis in 41/77 (53.2%) and at least once during treatment in 75/77 (97.4%). Median (IQR) IGF-1 Z-score was 0.02(IQR-0.05-0.08). Plasma IGF-1(IDS-iSYS assay) was above (but < 30% above) the upper-limit-of-normal (ULN) in 3/41(7.3%) at diagnosis; random GH was < 0.4 ng/ml in both patients with measured levels. IGF-1 levels >ULN were newly identified in 3(3.8%) patients on treatment, one of whom had normal baseline levels. In total, 3 patients (1M,2F) had persistently elevated plasma IGF-1 levels, all with random GH < 0.4 ng/ml). Within the overall group, there was no significant change in IGF-1 Z-score following Cabergoline treatment (p=0.36). Median IGF-1 levels in prolactinoma patients are similar to the population median. There was no convincing evidence of GH hypersecretion in any patients in this series. A limitation is the small number of male patients studied.*1.Akirov et al. IGF-1 levels may increase paradoxically with dopamine agonist treatment for prolactinomas. Pituitary2018;21(4):406-13.*

P14. Thyroglobulin as an alternative marker of iodine status in pregnancy

P McMullan[1], D McCance[1], P Smyth [2], J Woodside,[3] K Mullan[1]

[1]Royal Victoria Hospital (Regional Centre for Endocrinology and Diabetes) Belfast [2] School of Physics; School of Medicine and Medical Science, NUI, Galway; School of Medicine UCD [3]Institute for Global Food Security (Centre for Public Health), School of Medicine, Dentistry and Biomedical Sciences, Queen's University Belfast

Thyroglobulin (Tg) has been suggested as an alternative marker of iodine deficiency to the gold standard cohort median urinary iodine concentration (mUIC). The thyroid appears to mount a U shaped Tg response to extremes of iodine status. However, its value in pregnancy is not fully elucidated and a recent meta-analysis has called for further studies in pregnancy to determine the sensitivity of Tg at different degrees of iodine deficiency. Recent studies suggest a median population Tg > 13 μg/L or > 3% of values > 44 μg/L in second trimester as indicative of iodine deficiency. Factors that affect Tg interpretation include Tg antibodies and high levels of chorionic gonadotropin (hCG) in first trimester. Women attending the Royal Maternity Hospital Belfast were recruited in first trimester and followed through each trimester (n = 241). Women with Tg antibodies were excluded (6% in first trimester). As previously reported the mUIC was in the deficient range at 73, 96 and 117 μg/L in sequential trimesters ($n \geq 150$ μg/L). Corresponding median Tg levels were 19

μg/L (IQR 12-32), 16 μg/L (11-28) and 16μg/L (10-29) suggestive of iodine deficiency. Tg was > 44 μg/L in 14%, 9% and 12% of this cohort in sequential trimesters. Weak negative correlations were found between Tg and UIC in the first and second trimesters but were lost in the third. This is the first study of its kind on the island of Ireland and adds to the knowledge base of the sensitivity of Tg in pregnancy at this mild level of iodine deficiency.

P15. Indiscriminate thyroid function testing on acute hospital attendees reveals a high abnormality rate requiring follow up

RP McEvoy[1], A O'Riordan[1], MJ Hannon[1]

[1]Bantry General Hospital, Bantry, Co. Cork

The standard blood tests taken on arrival at our Medical Assessment Unit include thyroid function tests (TFTs), despite a recent review questioning the utility of this [1]. We performed a retrospective audit to determine what proportion of patients had abnormal TFTs on presentation, and whether these abnormal results were followed up appropriately. Patient records for all attendances between January and June 2018 were examined. Abnormal TFT results were classified as overt or subclinical hyper- or hypothyroid, or non-thyroid illness syndrome (NTIS). In total, 2,298 patients attended over the study period. Mean patient age was 67.2 years; 49% were female. TFTs were ordered on the day of attendance for 1,688 patients (73%). Of these, 181 (11%) were abnormal: 20 overt hyperthyroid, 72 subclinical hyperthyroid, 12 overt hypothyroid, 35 subclinical hypothyroid, and 42 NTIS. Nineteen patients died within 3 months of the abnormal TFT result. Of the remaining 162 patients, 66 (41%) had not been followed up within 3 months (3 overt hyperthyroid, 31 subclinical hyperthyroid, 3 overt hypothyroid, 13 subclinical hypothyroid, and 16 NTIS). The percentage of abnormal TFTs (11%) in this audit is in keeping with similar studies where TFTs were performed on unselected hospital populations [1]. 41% of abnormal tests were not followed up, demonstrating poor compliance with thyroid management guidelines. Future work will investigate adoption of an 'opt-in' order system and electronic alerts to flag abnormal results for follow-up [1]. Premawardhana LD. Thyroid testing in acutely ill patients may be an expensive distraction. Biochemia medica. 2017; 27(2): 300-307.

P16. A longitudinal study of effect of amiodarone on thyroid function in cardiac patients

S Aslam[1], R Lavery[1], C O'Sullivan[1], A Agha[1], BF McAdam[1]

[1]Dept of Cardiology and Endocrinology, Beaumont Hospital, Dublin 9, Ireland.

Amiodarone is an iodinated anti-arrhythmic prescribed for atrial and ventricular arrhythmias. High Iodine content/pharmacological properties can result in thyroid dysfunction. The aim of our observational study was to assess the effects of amiodarone on thyroid function and review management of thyroid dysfunction. Data collected from medical notes/electronic lab system for patients on amiodarone attending Beaumont Hospital Cardiology Department in the year 2018 with mean duration of exposure 36 months (range 0-147). 84 patients on amiodarone were included. Mean age 69 years, 62% male. The main indication was atrial fibrillation and ventricular tachycardia. From a monitoring perspective, thyroid function tests (TFTs) were checked in only 30% after 3 months of therapy and in those with longer follow up of 3 years labs were checked in 34%. Thyroid dysfunction was found in 66% patients, 27.3% thyrotoxicosis and 39% hypothyroidism. In the thyrotoxic patients 30% had type 1, 52% had type 2 amiodarone induced thyrotoxicosis (AIT). Mean time to derangement was 14.8 months ± 2.4. In the AIT group, amiodarone was discontinued in 69%, and 68% of these were started on anti-thyroid drug and/or steroids pending the final results. Less than 50% of patients were referred to endocrinology. Most patients with overt amiodarone induced hypothyroidism received Levothyroxine. Amiodarone is widely prescribed and has potential adverse thyroid effects. Many patients do not have adequate surveillance of TFTs when on treatment, only 2/3 of cases of hyperthyroidism led to complete cessation of therapy. Formal assessment and treatment of AIT was found to be sub-optimal in our cohort.

P17. Efficacy of radioactive iodine treatment of Benign Thyroid Disease in Adults using Fixed versus Calculated Activity of ^{131}I dose

M Mustafa [1], A Mahmeed [1], J Cooke [2], N Phelan [2], A McGowan [1],J Gibney [1],ML Healy[2]

[1]Robert Graves Institute, Tallaght University Hospital, Dublin 24.[2] Department of Endocrinology, St.James University Hospital. Dublin 8

Radioactive iodine treatment (I131) is a well-established and effective treatment of benign thyroid disease. Many centres still use fixed I131 activity. However, international best practice guidelines recommend dosimetry. In our centre we introduced a dosimetry protocol aiming to maximise clinical outcome while minimising radiation dose. This study aimed to examine treatment outcomes of patients who received a fixed activity I131 compared to those who received an individually calculated activity of I131. We retrospectively reviewed patients (n=70; 26 received fixed activity and 44 received calculated activity) who were treated for hyperthyroidism and compared thyroid function tests measured at 6, 12, 24, and 48 weeks following I131 therapy. Establishment of euthyroidal/hypothyroidal status by 48 weeks post I131 was designated a successful treatment. Baseline characteristics were similar between the two groups. Table 1 below shows the treatment outcome. Our study highlights the possibility of achieving higher treatment success rate with single calculate131I activity compared to a fixed activity and potential reducing radiation exposure.

Table 1: % of patients achieving successful treatment in fixed group vs calculated group

	fixed	calculated	95% CI	P value
Week 6	Euthyroid 11/26 (46.2%) Hypothyroid 0	Euthyroid 16/44 (36.4%) Hypothyroid 5/44 (11.4%)	(-0.18, 0.20) (-0.18, 0.30)	0.914 0.623
Week 12	Euthyroid 5/22 (22.7%) Hypothyroid 1/22 (4.5%)	Euthyroid 16/44 (36.4%) Hypothyroid 13/44 (29.5%)	(-0.36, 0.09) (-0.41, -0.09)	0.236 0.002
Week 24	Euthyroid 7/28 (25%) Hypothyroid 9/28 (32.1%)	Euthyroid20/46 (43.5%) Hypothyroid 13/46 (28%)	(-0.40, 0.03) (-0.178, 0.26)	0.092 0.725
Week 48	Euthyroid 11/27 (40%) Hypothyroid 6/27 (22%)	Euthyroid15/34 (44%) Hypothyroid 13/34 (38.2%)	(-0.28, 0.22) (-0.37, 0.07)	0.791 0.166

P18. Overview of maternal thyroid function testing during pregnancy at STGH

F Khan[1], Wrana[1], NS Mohamed[1], ASA Faud[1], HA Sohaib[1], MJ Brassill[1]

[1]Endocrine Department South Tipperary General Hospital, Clonmel.

Thyroid disease in pregnancy is a common clinical problem. Recent guidelines do not recommend for or against universal screening in early pregnancy[1]. We sought to ascertain prevalence of thyroid disease in pregnancy in our institution. We retrospectively analysed TSH in 777 pregnant women at their first antenatal visit over a one year period. 736 women (95%) had a TSH checked at booking. 38 (5%) had a TSH below the reference range (TSH < 0.27 mIU/L), 30 (4%) had a raised TSH (TSH > 4 mIU/L) and 668 (91%) had a TSH between these levels. Of the 30 with TSH > 4 mIU/L, 11 had known primary hypothyroidism with an additional one newly diagnosed in pregnancy. One had known subclinical hypothyroidism (SCH) and eight had newly diagnosed SCH in pregnancy. All 21 were treated and followed in the endocrine clinic. Of the remaining nine, five had a normal TSH on repeat and negative TPO antibodies so were not treated. Four had no follow up. Of the 38 with TSH < 0.27 mIU/L, four had a known diagnosis of primary hypothyroidism and two had known Graves disease. Two of the remaining 32 had an elevated freeT4 level and were diagnosed as gestational hyperthyroidism. Of the remaining 30, 25 had a normal TSH at follow up and five had no follow up. Of the 668 with TSH 0.27-4 mIU/L, 27 had known thyroid disease (15 primary hypothyroidism, 11 SCH, one Graves disease). Median TSH in the entire cohort (excluding known thyroid disease) was 2.53mIU/L. Approximately 10% of our cohort had known or new thyroid disease in pregnancy requiring endocrine input. *Reference: Erik K. Alexander, Elizabeth N. Pearce, Gregory A. Brent, Rosalind S. Brown, Herbert Chen, Chrysoula Dosiou, William A. Grobman, Peter Laurberg, John H. Lazarus, Susan J. Mandel, Robin P. Peeters, and Scott Sullivan. 2017 Guidelines of the American Thyroid Association for the Diagnosis and Management of Thyroid Disease during Pregnancy and the Postpartum. Thyroid 2017; 27: 315–389.*

P19. Alemtuzumab-induced thyroid dysfunction - follow up data from the Northern Irish cohort

F Kennedy[1], S Kiernan[1], F Magill[1], T Ormston[2], K Ike[2], R Kee[1,2], PC Johnston[3], O Gray[4], J Campbell[5], A Droogan[1], S Hughes[1], GV McDonnell[1]

[1]Department of Neurosciences, Belfast Health and Social Care Trust, [2]Queen's University Belfast, [3]Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast Health and Social Care Trust, [4]South Eastern Health and Social Care Trust, Belfast, [5]Southern Health and Social Care Trust, Craigavon, United Kingdom

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P20. TEAM-eD5 (Thyroid Eye Disease Amsterdam Declaration Implementation Group) launch in NI: importance of TSH receptor Antibodies (TRAB) in care pathway entry

C Hamill[1], J Smyth[1], U Graham[1], H Wallace[1], S Hunter[1], H Courtney[1], I Wallace[2], A Nugent[2], A Lewis[2] P Johnson[2], J R Lindsay[3], N Iqbal[3], P Bogusz[3], D McCance[1], M McDonnell [4], K Spence[4], K Mullan[1]

[1]Regional Centre for Endocrinology and Diabetes RVH Belfast [2]Belfast City Hospital, Belfast [3]Mater Infirmorum Hospital, Belfast [4]Regional Endocrine Laboratory, RVH Belfast

Thyroid Eye Disease (TED) affects ~50,000 people in the UK. It is often distressing, disfiguring, and is associated with sight threat in 3-5% of cases. TEAMeD has launched a UK-wide program (TEAM-eD5) to standardise care - the first of its kind in Europe. The program is timely given new treatment possibilities in phase-3 trials and centres on five key elements: Diagnosis/Screening/Alert systems/Prevention and Referral pathways. For diagnosis, TEAM-eD5 advocate routine measurement of TSH receptor Abs (TRAB) in patients with thyrotoxicosis (> 95% sensitivity and specificity for Graves' disease). This is now part of NICE guidelines (2019) and cost is modest (~£23/ €25).

We audited patients who had TRABs measured in the Belfast Trust over a 12-month period. There were 376 patients, 306 were female (81%) and TRABs were positive in 214 (57%). Of these, 81 had no evidence of thyroid eye disease. We screened proportionally more men (19%) than might have been expected for the general male prevalence of hyperthyroidism. This may reflect clinicians' concerns that men have an increased risk of more severe eye disease than women. A significant number of patients with positive TRABs had no clinical TED (38%). These patients would not otherwise benefit from a pathway, which includes formal clinical activity scoring (CAS), provision of TED early warning cards and designation of a contact, specific counselling regarding smoking and timely referral to a joint specialist clinic.

Audits

P21. A Re-audit on Investigation and Diagnosis of Hyponatraemia in a Level II Irish Hospital

NM Awan[1], B Rizvi [2],W Mahmood [1],D O'Shea D[1,3,4], R Canavan [1,3,4]

[1]Department of Endocrinology, St. Columcille's Hospital, Loughlinstown, Co. Dublin, [2]Department of Medicine/ Gastroenterology, St. Columcille's Hospital, Loughlinstown, Co. Dublin[3]Department of Endocrinology, St. Vincent's University Hospital, Elm Park, Dublin [4]UCD School of Medicine, Belfield, Dublin

Background: Hyponatraemia is a common electrolyte disturbance associated with significant morbidity and mortality. We previously conducted an audit of patients with hyponatraemia admitted to our hospital in 2019. Some deficiencies were noted in the investigation and management of these patients. Following that audit, we introduced an algorithm focusing on a simplified approach to patients with hyponatraemia. A re-audit was carried out this year to re-evaluate our practice. Results: 35 patients with hyponatraemia were hospitalized during the audit period of 2 months. The mean age of patients was 73.14 ± 12.38 years. M: F was 1:1.5. 54% (n = 19) of the patients had mild hyponatraemia (Na 130-134), 26% (n = 9) had moderate hyponatraemia (Na 125-129), and 20% (n = 7) had severe hyponatraemia (Na < 125). Records of patients with moderate to severe hyponatraemia (n=16) were further analyzed. Drug history was recorded in 100% of these patients. Volume status was documented in 75% of patients. Plasma and urine osmolalities were measured in 75% of patients. Urinary sodium was measured in 68.7%. Cortisol and TFTs were measured in 56.2% and 81.2% of patients respectively. 25% of the patients were started on IV fluids regardless of the volume status. Aetiology of hyponatraemia was established in 68.7% of cases. SIADH/Drug-induced hyponatraemia was recorded as the most common cause. Diagnosis of hyponatraemia was documented in 43.7% of discharge summaries. Conclusion: The overall approach to investigation and management of hyponatraemia has improved in our hospital since the previous audit. There is room for improvement and ongoing education and practice audits should help in achieving this goal.

P22. A Re-audit of basal (long acting) insulin prescription in the management of Diabetic Ketoacidosis and its effect on length of hospital stay

A Rafi[1], *I Malik*[1], *B McDonnell*[1], *E Brosnan*[1]

[1]Endocrinology Department, Mayo University Hospital, Castlebar

Diabetic ketoacidosis (DKA) is an acute life-threatening metabolic complication of diabetes that imposes substantial burden on healthcare system. An audit was performed (cycle 1) in 2019 in a regional hospital to determine basal insulin prescription and its effect on hospitalisation length. The results were presented in grand rounds and medical meetings to improve the management of DKA. This re-audit was aimed to evaluate adherence to basal insulin prescription and its effect on length of hospital stay. Retrospective data of patients admitted with DKA diagnosis in Mayo University Hospital between March 2019 and April 2020 was collected and analysed. Out of 19 patients,10 (52%) were males and 09 (48%) females.14 patients (74%) were prescribed subcutaneous long acting insulin along with continuous Intravenous insulin while 4 (21%) were not. 1 patient (5%) was prescribed but did not receive. Patients who received basal insulin, their average duration on intravenous insulin was 0.76 days (18 hrs) and length of hospital stay was 3.8 days. Patients who didn't receive basal insulin, their average duration on intravenous insulin was 1.8 days (42.3 hrs) and average hospital stay was 10 days. Above results re-emphasise the importance of basal insulin in DKA management. Although compliance with Basal insulin prescription has improved from 50% (previous cycle) to 74% but still there is room for improvement. Basal Insulin reduce the duration of insulin infusions and facilitates smoother transition from intravenous to subcutaneous insulin, ultimately leading to shorter length of hospital stay and reduced costs in the treatment of DKA.

P23. Diabetic ketoacidosis in adult patients: an audit of adherence to DKA protocol in St Michael's Hospital, Dun Laoghaire.

L.Dooley[1], *A.Fitzpatrick*[1], *L. Fitsimons*[1], *B.Lynch*[1], *D.Slattery*[1]

[1]Department of Endocrinology, St Michael's Hospital, St Vincent's Healthcare Group, Dublin

Diabetic ketoacidosis (DKA) is a life threatening acute complication of diabetes. Compliance with DKA guidelines have been shown to significantly reduce the length of hospital stay, escalation to Intensive care admission and time to correction of ketoacidosis. Our DKA management guidelines in St. Michael's Hospital incorporates the widely accepted fixed rate intravenous (IV) insulin infusion calculated on bodyweight. We conducted an audit of the DKA protocol in St Michael's hospital aiming to identify adherence and outcomes for our protocol. We identified nine patients with DKA from June 2019 to May 2020, median age 32 (22-85). 89% were male, and 89% were type 1 diabetics. 56% percent of patients became hypoglycaemic (BGL < 4.0 mmol/l) while receiving the fixed rate IV insulin infusion. Of the patients who developed hypoglycaemia, 40% were not treated appropriately as per hospital hypoglycaemia treatment guidelines. 44% of patients did not receive appropriate basal insulin (incorrect dosing, incorrect type of insulin, or dose omitted entirely). There was a notable delay in discontinuation of the protocol (on average 6 hours between criteria to stop and actual discontinuation). We concluded from these results that errors are occurring frequently on the current protocol, highlighting a need to re-educate staff. Frequency of hypoglycaemia on the protocol was high, indicating a possible need to change the protocol to prevent this. Treatment of hypoglycaemia for patients on the protocol should be clarified.

P24. An Audit on the Management of Diabetic Ketoacidosis (DKA) During the COVID-19 Pandemic in St. Vincent's University Hospital

A McCarthy[1], *R Crowley*[1]

[1]St. Vincent's University Hospital, Elm Park, Dublin 4

DKA is a complication of type 1 diabetes mellitus with a 5% mortality rate. Patients with diabetes who test positive for COVID-19 have a higher mortality rate and worse prognosis than the general population[1]. In this audit, patients treated for DKA between March-April 2020 in SVUH were identified and their medical records were reviewed to assess adherence to the DKA protocol. Patients treated for DKA during March-April 2019 were used as a comparison population. There were 10 cases of DKA in SVUH in March-April 2020. 10% of patients were under the care of an Endocrinology Consultant. 50% were not prescribed appropriate basal insulin and 40% received inappropriate fluid prescription. 60% of patients with DKA were admitted via the COVID-19 pathway. Of these, 50% were prescribed inappropriate fluids, compared to 25% of patients admitted via the medical/non-COVID pathway. There were 9 cases of DKA in SVUH in March-April 2019. 66% of patients were under the care of an Endocrinology Consultant. 88% were prescribed appropriate basal insulin and 77% were prescribed appropriate fluids. There was not a statistically significant difference in the rates of appropriate basal insulin prescription between the 2019 and 2020 cohort (p value 0.07), likely attributable to the small sample size. In conclusion, adherence to the DKA protocol was suboptimal during the COVID-19 pandemic. As we enter the second wave of this pandemic, we have an opportunity to educate staff on the importance of adherence to the DKA protocol to optimise patient care. *Reference: Kim N. Acute Hyperglycemic Crises with Coronavirus Disease-19. Diabetes & Metabolism Journal 2020; 349*

P25. Re-audit of basal insulin administration in diabetic ketoacidosis in St Vincent's University Hospital – Closing the loop

H Forde[1], *RK Crowley*[1].

[1]Department of Endocrinology, St Vincent's University Hospital, Elm Park, Dublin 4.

Basal insulin administration during the management of diabetic ketoacidosis (DKA) is recommended as it prevents rebound hyperglycemia and ketosis when intravenous insulin is discontinued. A previous audit conducted in St. Vincent's University Hospital (SVUH) in 2015 demonstrated that 79% of patients admitted with DKA received basal insulin within 24 hours of admission, and those patients had earlier resolution of DKA and a shorter length of hospital stay. The DKA protocol in SVUH was subsequently updated to recommend basal insulin administration as one of the first steps in the management of these patients. We conducted a re-audit of timing of basal insulin administration in DKA presentations to SVUH between December 2018-June 2019. Patients were identified from hospital in-patient enquiry (HIPE) coding. Chi-squared tests were used to determine if there were significant differences between groups. Twenty-eight patients were identified. Data was missing in 5 patients who were therefore excluded. Sixty-eight percent of patients had type 1 diabetes mellitus and mean glycated haemoglobin (HbA1C) for the group was 87 mmol/mol. Seventy-four percent of patients received basal insulin within 6 hours, and 26% of patients received basal insulin between 6-24 hours of presentation. Patients who received basal insulin within 6 hours of presentation were more likely to have resolution of DKA within 24 hours ($p = 0.00059$) and more likely to be discharged within 48 hours ($p = 0.019$). This re-audit demonstrated good adherence to the updated SVUH DKA

protocol but continues to suggest that earlier delivery of basal insulin is associated with better outcomes in DKA.

P26. Perioperative Management of Diabetes in an Acute Hospital Pre-implementation of Formal Guidelines.

IM Godson-Treacy[1], J Noble [1], D Dooner [2], D Walsh [3] , PJ Murphy[4]

[1]Department of General Internal Medicine, Midland Regional Hospital Tullamore, Tullamore, Co. Offaly [2] Diabetes Clinical Nurse Specialist, Midland Regional Hospital Tullamore, Tullamore, Co. Offaly [3]Department of Pharmacy and Therapeutics, Midland Regional Hospital Tullamore, Tullamore, Co. Offaly [4]Department of Acute Medicine/ Diabetology, Midland Regional Hospital Tullamore, Tullamore, Co. Offaly

Poor perioperative control is associated with increased morbidity and mortality postoperatively. This audit investigated the perioperative management of patients with diabetes in a hospital without institutionally accepted guidance. This audit retrospectively assessed the performance of this hospital between January and March 2020 against the guideline produced by the Joint British Diabetes Society in 2016. 31 patients were included in this audit, all had type 2 diabetes mellitus. 5(16%) were prescribed insulin at baseline. 11 patients were admitted electively, 82% were referred to pre-operative assessment including HbA1c check within the 3 months preceding surgery, none of whom warranted referral to diabetes specialist. 90% of patients were admitted on day of surgery and 45% were appropriately scheduled in the first 1/3rd of the list. 91% of these patients did not have their medication/insulin adjusted as per JBDS guidance, despite this 90% of glucose readings were maintained within the target range 6-12 mmol/L. 20 patients were admitted as emergency cases and were not seen for pre-operative assessment. 60% of these patients did not have their medications/insulin adjusted as per JBDS guidelines, but 75% had their blood glucose readings maintained within target range. From the data we have generated it appears the pre-operative management of patients with diabetes in our hospital is not-compliant with international best practice regarding adjustment of insulin and oral hypoglycaemic agents. At time of this audit a sub-group had been convened to develop and implement perioperative guidance specific to this hospital. We hope to re-audit following adoption of hospital-wide guidelines. *Reference- Joint British Diabetes Societies for Inpatient Care-Management of adults with diabetes undergoing surgery and elective procedures: Improving standards. March 2016*

P27. Audit on glycaemic control in Gestational Diabetes Mellitus (GDM) patients receiving corticosteroids

I Malik[1], A Rafi[1], U Healy[1], S Hoashi [1,2]

[1]Diabetes and Endocrine Centre, Regional Hospital Mullingar, Co Westmeath [2] UCD School of Medicine, Co Dublin

Administration of antenatal steroids for foetal lung maturity is considered for all women at risk for preterm birth before 37 weeks. Administration of two doses of Betamethasone 12 mg intramuscularly, 24 hours apart may result in a deterioration of glycaemic control for 2 to 3 days specially in patients with Gestational Diabetes Mellitus (GDM). Treatment with Variable Rate intravenous Insulin Infusion (VRIII) has shown to improve glycaemic control and help in improving glucose excursions. Aim of this audit was to assess hourly glucose monitoring after treating patients with VRIII between the 2 doses of betamethasone and for next 12 to 24 Hours. Retrospective data was collected from chart review of 17 patient who were admitted for betamethasone injections and subsequently monitored for 12 to 24 hours after last dose of betamethasone. Audit result has shown better glycaemic control and less glucose excursions in patients treated with VRIII after steroid injection. Recommendation was made to treat all GDM patients with VRIII after steroid injection. Also it has been recommended to do a comparative study on patients treated with VRIII and those treated without VRIII after steroid injections.

P28. An Audit of Relationship between Metformin Dosing and Micronutrients deficiency

A Rafi[1], R Shah[1], I Malik[1], P Muthalagu[1]

[1]Department of Medicine, Cavan General Hospital, Cavan, Ireland.

Type 2 diabetes mellitus (T2DM) is a growing epidemic worldwide. Metformin is first line agent and one of the most commonly used oral hypoglycaemic agent after dietary and life style modification. However, Metformin use does have few disadvantages. Apart from common gastrointestinal side effects, long term Metformin use leads to vitamin B12 malabsorption and to a lesser extent, folate and iron malabsorption. Aim of this audit was to assess the prevalence of micronutrients deficiency especially vitamin B12 deficiency in diabetic patients on long-term Metformin treatment. Prospective data was collected of patients attending outpatient diabetic clinics in Cavan and Monaghan Hospital. Patients were grouped according to their metformin intake either ≤ 2 gm/day or > 2 gm/day. Out of total 89 patients, 52 (58%) patients were taking ≤ 2 gm/day metformin and 37 (42%) were taking > 2 gm/day metformin. Prevalence of iron deficiency was 5.7% (3/52), Vitamin B12 deficiency was 13.4% (7/52) and folate deficiency was 5.7% (3/52) in patients taking ≤ 2 gm/day Metformin. While in patients taking > 2 gm/day of metformin, Iron deficiency was 5.4% (2/37), Vitamin B12 deficiency was 24.32% (9/37) and folate deficiency was 5.4% (2/37). Thyroid function tests were normal in both groups. These audit results demonstrate that long term metformin use is associated with micronutrient deficiencies, notably vitamin B12, and the relationship is directly proportional to the dose of metformin. Results were presented in hospital grand rounds and recommendations were made to screen patients for micronutrients including vitamin B12 especially those on long term metformin and taking more than 1g/day.

P29. X-linked hypophosphatemia patient work-up at St. Vincent's University Hospital is managed to European consensus guidelines.

M. McDermott[1], P. Twomey[2], S. Van der Kamp[2] and RK. Crowley[1,2].

[1]University College Dublin, Dublin, Ireland. [2]St. Vincent's University Hospital, Dublin, Ireland.

Audit to assess the compliance at St. Vincent's University Hospital (SVUH) with clinical practice guidelines when assessing patients with X-linked hypophosphatemia (XLH)[1]. This audit was completed in conjunction with the application for recognition as part of the European Reference Network for Rare Bone Disease. The audit included all patients with a diagnosis of XLH that had been assessed and treated in the complex bone clinic from 2013 to 2020 ($n = 22$). Patients diagnosed at SVUH ($n = 3$) received clinical evaluation, specialist investigations, genetic testing and counselling in 100% of cases, 67% had radiographs taken and 33% had a documented exclusion of Fanconi syndrome. The remaining patients ($n = 19$) had a prior diagnosis of XLH on reaching SVUH. 94% of diagnostic guidelines were met. Treatment of patients with conventional therapy ($n = 19$) included ongoing parathyroid hormone assessment and specialist investigations in 100% of cases. Patients receiving Burosumab therapy ($n = 3$) received additional serum phosphate and TmP/GFR assessments. 100% of treatment guidelines were met. All patients received yearly review. Quality of life evaluations, 6 minute walk

tests, kidney ultrasounds and blood pressure measurements were identified as requiring additional effort. 86% of follow-up guidelines were met. We can conclude that SVUH adhere to clinical practice guidelines for diagnosis, treatment and follow-up of patients with XLH. *Haffner D, Emma F, Eastwood DM, Duplan MB, Bacchetta J, Schnabel D, Wicart P, Bockenhauer D, Santos F, Levtchenko E, Harvengt P. Clinical practice recommendations for the diagnosis and management of X-linked hypophosphataemia. Nature Reviews Nephrology. 2019 May 8:1.*

Basic science

P30. Blue whiting protein hydrolysate has potential for glycaemic management and control.

AD Holmes [1], S Sharkey [1], R Lafferty [1], L Hollywood [2], A Burns [2], J Whooley [3], S Gite [3], FPM O'Harte [1].

[1]Diabetes Research Group, School of Biomedical Sciences, Ulster University, Coleraine [2]Department of Hospitality and Tourism Management, Ulster University Business School, Ulster University, Coleraine [3]Bio-marine Ingredients Ireland Ltd., Unit 9 Lough Egish Food Park Co. Monaghan, Ireland.

Blue whiting (*Micromesistius poutassou*) is a pelagic fish species found within the North-East Atlantic Ocean including the British Isles. Until recently, blue whiting was usually discarded as a low value bycatch product. Nevertheless, blue whiting protein could have potential as a valuable source of dietary protein, or a functional food ingredient following further enzymatic hydrolysis and fractionation. A commercially-produced blue whiting protein hydrolysate (BWPH) (0.5 – 10 mg/ml) was assessed for potential insulinotropic effects on cultured pancreatic BRIN-BD11 cells ($n = 8$), at 5.6 mM glucose. Cell viability was evaluated in addition, using an MTT assay ($n = 4$). The efficacy of the BWPH (100 mg/kg bodyweight; $n = 10$), administered by gavage 20 min before glucose, on oral glucose tolerance response, was analysed in lean NIH Swiss mice. Furthermore, the impact of oral BWPH (50 – 400 mg/kg bodyweight; $n = 8$) was tested, by measuring food intake in diet-restricted mice, trained to eat for 3 h per day. The BWPH showed no significant *in vitro* insulinotropic or cytotoxicity effects versus glucose controls. However, an improvement in glucose tolerance ($P < 0.05$) was observed in BWPH treated mice at 15, 30 and 60 min post glucose bolus ($P < 0.05$ to $P < 0.01$), which was further supported by $AUC_{(0\text{-}90\ min)}$ data when compared to the glucose only controls ($P < 0.05$). The BWPH showed no significant effect upon food intake up to 3 h, in diet-restricted mice. It is possible that smaller peptide fragments from additional enzymatic digestion of this BWPH, may have enhanced insulinotropic and glucose-lowering activity, increasing its potential as a functional food ingredient.

P31. Prolonged neuropeptide Y1 receptor activation promotes alpha- to beta-cell transdifferentiation in insulin-deficient, diabetic mice

R.A. Lafferty[1], N. Tanday[1], P.R. Flatt[1], N. Irwin[1].

[1]School of Biomedical Sciences, Ulster University, Coleraine, BT52 1SA, UK

Benefits of PYY(1-36) on pancreatic beta-cell mass, through NPY1R activation, are well-established, with obvious potential exploitation for diabetes therapy. The current study investigated the role of alpha- to beta-cell transdifferentaition in these NPYR1-mediated pancreatic benefits, using transgenic mice that allow for alpha-cell lineage tracing. Sea lamprey-PYY(1-36) (SL-PYY(1-36)), previously highlighted as a long-acting, NPY1R-specific, PYY(1-36) analogue, was used to impart sustained upregulation of NPYR1 signalling. Diabetes was induced in transgenic $Glu^{CreERT2}$;*ROSA26-eYFP* mice using multiple low-dose STZ (50 mg/kg/bw, 5 days). Mice ($n = 6$) received twice-daily saline or SL-PYY(1-36) (25 nmol/kg/bw) injections for a total of 11 days. Biochemical and metabolic parameters were assessed regularly, with effects on pancreatic morphology, islet hormone content and cell lineage examined at the end of the treatment. STZ-induced decreases in plasma- and pancreatic-insulin levels ($P < 0.001$), which were partially ($P < 0.05$-$P < 0.001$) reversed by SL-PYY(1-36). Characteristic STZ reductions ($P < 0.05$-$P < 0.001$) in islet number, beta-cell and islet areas, and increase overall alpha-area as well as central islet invasion of alpha-cells were apparent in $Glu^{CreERT2}$;*ROSA26-eYFP* transgenic mice. Pancreatic morphological alterations were largely reversed by SL-PYY(1-36), aside from changes in alpha-cell area. In addition, whilst STZ decreased ($P < 0.001$) alpha- to beta-cell transition, this transdifferentaition process was significantly ($P < 0.001$) up-regulated by SL-PYY(1-36). All changes occurred independent of body weight, food or fluid intake. Benefits of NPY1R-on beta-cell mass are linked to positive changes in islet-cell lineage, namely the transdifferentiation of alpha- to beta-cells.

P32. A novel acylated apelin-13 analogue shows benefits on pancreatic islet cell turnover and transdifferentiation in two diabetic animal models.

FPM O'Harte[1], N Tandy[1], N Irwin[1], RC Moffett[1] and PR Flatt[1]

[1]Diabetes Research Group, School of Biomedical Sciences, Ulster University, Cromore Road, Coleraine, Northern Ireland BT52 1SA

Apelin-13 analogues have been shown to have positive therapeutic effects in diabetes. Here we examined potential pancreatic benefits of repeated apelin analogue treatment in both streptozotocin (STZ) and high-fat fed, diet-induced obese (DIO) diabetic mouse models. Islet cell apoptosis, proliferation and transdifferentiation were examined using $Ins1^{Cre/+}$;Rosa26-eYFP transgenic mice and in STZ- and DIO-treated mice. Groups ($n = 6$-8) of STZ-induced and DIO-induced diabetic mice received once-daily injection (25 nmol/kg) of the long-acting acylated apelin-13 analogue, pGlu(Lys^8Glu-PAL)apelin-13 amide, for 10 or 12 days, respectively. pGlu(Lys^8 Glu-PAL)apelin-13 amide treatment partly reversed STZ-induced body weight loss and normalized circulating insulin. In contrast, these variables were not altered in DIO diabetic mice, but an increase in pancreatic insulin content was observed. Apelin analogue treatment also fully, or partially, reversed the detrimental effects in STZ and high-fat feeding in mice on plasma and pancreatic glucagon concentrations, respectively. In DIO mice, the acylated apelin analogue decreased dietary-induced elevations of islet, β- and α-cell areas ($P < 0.05$-$P < 0.01$), whilst reducing α-cell area in STZ-induced diabetic mice. In terms of islet cell lineage, pGlu(Lys^8 Glu-PAL)apelin-13 amide effectively reduced β- to α-cell transdifferentiation in STZ-induced diabetic mice and helped maintain β-cell identity, which was linked to elevated Pdx-1 expression ($P < 0.001$). These islet effects were coupled with decreased β-cell apoptosis and α-cell proliferation in both diabetic models, and there was an accompanying increase of β-cell proliferation in STZ-induced diabetic mice. Overall, antidiabetic pancreatic islet benefits of sustained APJ receptor activation are linked to favourable islet cell morphology, leading to maintenance of β-cell mass.

P33. Altered incretin action and receptor expression in ovaries and adrenals is linked to disturbed oestrous cycles of high-fat fed Wistar rats.

D Khan[1], *A Sridhar*[1], *PR Flatt* [1]*and RC Moffett*[1]

[1]School of Biomedical Sciences, Ulster University, Coleraine, N. Ireland, UK

Insulin resistance and polycystic ovary syndrome are often linked with obesity-related reproductive dysfunction. Incretin hormones regulate feeding and insulin function. The present study assessed altered oestrous cycling, differential expression of incretin receptors and morphology in adrenal and ovaries of high-fat (HF) fed female rats. Female Wistar rats (4-weeks old) were fed HF-diet with monitoring of body weight and blood glucose. After 16-weeks of HF-feeding 4-consecutive oestrous cycles were observed using vaginal smears. Metabolic parameters, tissue morphology and gene expressions for incretin receptors in ovaries and adrenals was assessed at 20-weeks. HF-feeding significantly ($p < 0.001$) increased body weight with no alterations in blood glucose and HbA1c. Plasma insulin was elevated by 4.3-fold and HOMA-IR by 3.3-fold, suggested degree of insulin resistance. After 16-weeks, 50% of HF-fed rats presented with prolonged oestrous cycles duration (≥ 7 days) with an average cycle length of 4.9 ± 0.3, compared to normal rats 4.0±0.1days. Morphology of the ovaries in majority of HF-fed rats, assessed by H&E staining, showed increased size and cystic appearance and increased adrenal capsule thickness ($p < 0.001$) with no difference in zona glomerulosa compared to controls. Ovarian expression of *Glp-1r (glucagon-like-peptide-1R)* and *Insr* (insulin-R) genes were upregulated ($p < 0.05$-$p < 0.001$) while *Amh* (anti-mullerian-hormone), *Npy2R (NeuropeptideY2R)* and *GcgR (glucagon-R)* were downregulated ($p < 0.01$). Expression of *Glp-1r, Gipr (glucose-dependent-insulinotropic-polypeptide-R)*, *Gshr* (ghrelin-R), *Insr, Amh*, *Esr-1* (estrogen-receptor-1), *Npy2R* and *GcgR* genes were upregulated ($p < 0.01$-$p < 0.001$) in adrenals. These data demonstrate that obesity and insulin resistance result in deranged oestrous cycling and suggest that gut-peptide receptors on ovaries and adrenals may be important mediators in the modulation of female reproductive function.

Case reports

P34. Co existence of a corticotroph adenoma and a multifunctional pituitary cyst

D. McDonnell[1], *C. Kennedy*[1], *L. Cussen*[1], *Y. Qaoud*[1], *K. Heverin*[2], *D. Smith*[1], *M. Javadpour*[3], *A. Agha*[1].

[1]Department of Endocrinology Beaumont Hospital, Dublin[2]Department of Chemical Pathology Beaumont Hospital, Dublin,[3]Department of Neurosurgery Beaumont Hospital, Dublin

The co-existence of a corticotroph adenoma and a pituitary cyst is very unusual. We present the case of a 50-year-old female who presented with a Cushingoid phenotype, severe hypokalaemia, hyperglycaemia and hypertension. Urinary free cortisol was marked elevated at 50 fold. ACTH levels were elevated at 121.4 pg/ml. She failed both the low and high dose dexamethasone suppression tests. The CRF test did not show a satisfactory rise in ACTH levels and the Inferior petrosal sinus sampling revealed a peripheral to central ACTH gradient of 1:7 therefore not confirming Pituitary dependant Cushing's. . MRI pituitary revealed a large cystic lesion with a small solid component. Computed Tomography (CT) of thorax abdomen and pelvis was normal. A trans-sphenoidal hypophysectomy was performed, during which a fine needle aspiration of the intracystic fluid was obtained. This showed markedly elevated pituitary hormone levels of ACTH (1399 pg/ml), prolactin (353,084 mIU/L), TSH (217 IU/L), FSH (> 200 mIU/ml) and GH (519 ng/ml) consistent with a multifunctional pituitary cyst. Neuropathology of the solid part confirmed a corticotroph adenoma. Post-operative cortisol levels were persistently suppressed to less than 50 nmol/l with marked improvement in clinical features. This case highlights the challenges of the work up of Cushing's syndrome and the limitations of tests in the extremes of hypercortisolaemia. The coexistence of a corticotroph adenoma and a multifunctional pituitary cyst is very unusual and to our knowledge has not been reported before.

P35. Ectopic ACTH Syndrome presenting as Pneumocystis Pneumonia

C Kennedy [1], *L Cussen* [1], *C Newman* [1], *M Sherlock*[1], *CJ Thompson*[1], *M O'Reilly* [1]

[1]Department of Endocrinology and Diabetes Beaumont Hospital

Ectopic Adrenocorticotropic hormone (ACTH) syndrome occurs in 5–10% of ACTH-dependent hypercortisolism. We present the case of a 35-year-old gentleman with a six-month history of 16 kg weight gain and breathlessness. Pulmonary imaging revealed bilateral infiltrates suspicious for pneumocystis pneumonia (PCP). Physical examination was positive for facial plethora, easy bruisability and broad violaceous striae. Laboratory indices noted a profound hypokalaemia of 2.3 mmol/L (3.5-4.5 mmol/L). Hypercortisolaemia was confirmed with an overnight dexamethasone supression (ONDS) cortisol of 656 nmol/L. 24 hr Urinary Free Cortisol (UFC) was raised at 853 nmol/24 h. ACTH was elevated at 167 (72-63.3 pg/ml). The remainder of his pituitary profile was unremarkable aside from a testosterone of 3.0 (8.6-29 nmol/L). Ectopic ACTH was confirmed with corticotroph releasing factor (CRF) testing failing to show a satisfactory rise in ACTH (147 to 175 pg/ml; 19%). Inferior petrosal sinus sampling (IPSS) did not show an ACTH gradient and magnetic resonance imaging (MRI) of pituitary was negative for an adenoma. Computed tomography of the thorax, abdomen and pelvis (CT-TAP), octreotide scintigraphy and 68Ga-DOTA-TATE PET/CT failed to identify a culprit lesion. Calcitonin and 5-hydroxyindoleacetic acid (5-HIAA) levels were normal. His cortisol levels responded to metyrapone, with addition of hydrocortisone to prevent adrenal insufficiency. His PCP was successfully treated with co-trimoxazole. The clinical course was complicated by decompensation of congestive cardiac failure secondary to Cushing's cardiomyopathy. After multidisciplinary team discussion, a bilateral adrenalectomy was performed. This case highlights the profoundly immunocompromised state of Cushing's syndrome and the diagnostic challenge in localizing the offending lesion in ectopic ACTH.

P36. A case of an acidophil stem cell pituitary adenoma

L Kayes[1], *K Mullan*[1]

[1]Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast

A 48-year old man presented with a three-day history of peripheral visual disturbance. MRI demonstrated a 20 x 20 x 18 mm pituitary lesion within an expanded sella and optic chiasm compression. Preoperative prolactin was 996 mIU/L (86-324 mIU/L); IGF1 32.6 nmol/L (8.8-26.9 Immulite assay), GH 0.7 ng/ml, testosterone 5.9 nmol/L (8.6-29.0), LH 3.2 IU/L (1.7-8.6), FSH 3.2 IU/L (1.5-12.4 IU/L) and cortisol 431 nmol/l stimulated to 891 nmol/L post synacthen (> 480). Emergency trans-sphenoidal resection was difficult after penetration of a very fibrous capsule. A sphenoid mucosal flap and fat grafting was required. Post-operatively he developed panhypopituitarism and was later readmitted with flash epistaxis, BP 60/40mmHg and haemoglobin drop from 136 to 85 g/dL. He was transfused and underwent endoscopic coagulation of the

sphenopalatine artery. Histopathology reported cells with pronounced nuclear atypia and positive staining for synaptophysin and prolactin. Ki-67 index was 7% with three mitoses per 10HPF (markers of risk: Ki-67 index ≥ 3% and >two mitoses per 10HPF). MRI brain/spine and CT Chest/Abdomen/Pelvis demonstrated no evidence of metastatic disease. Following discussion with groups in Manchester and UCLA, a diagnosis of acidophil stem cell adenoma was made and cabergoline started and titrated. At 12-weeks post-op prolactin < 30 mIU/L, IGF1 37.5 nmol/l (10.8 - 27.3 nmol/L new Roche assay) and imaging demonstrates no evidence of residual/metastatic disease. Acidophilic stem cell adenomas represent 0.2% of pituitary adenomas and are potentially aggressive. There is no evidence, yet, in this patient of aggressive disease – i.e. metastases/progression/poor response to treatment as per the 2018 ESE guideline. However, he is regarded as high risk, requires close follow-up and may need temozolomide treatment/radiotherapy.

P37. Remission of TSH secreting microadenoma treated with primary stereotactic radiosurgery

T McDonnell[1], I Galloway[1], J OShea[4], K Moore[3], Thompson CJ[1,2], C Faul[4], M Sherlock[1,2]

[1]Academic Department of Endocrinology, Beaumont hospital, Dublin Ireland [2]Department of Endocrinology, Royal College of Surgeons in Ireland, [3]Naas General Hospital, Naas, Co Kildare, Ireland [4]Department of Radiation Oncology, Saint Luke's Hospital Radiation Oncology Network

TSH-secreting pituitary adenomas (TSHomas) are rare, accounting for < 1% of pituitary tumours. Radiotherapy is usually used as an adjunct to surgery, particularly when surgery has not been curative. We report a case of primary management of a TSH secreting microadenoma with Stereotactic Radiosurgery (SRS) using Cyberknife and leading to biochemical and tumour control with preservation of anterior pituitary function. A 42 year old man presented with thyrotoxicosis associated with 11 kg weight loss, tremor, increasing bowel motions and palpitations with a high resting heart rate. Biochemistry reported discordant thyroid function test (TFTs) with TSH 5.24mU/L (0.3-4.2), Free T4 51.8 pmol/L (12-22), Free T3 23.7 pmol/l (3.1-6.8). Sex Hormone Binding Globulin was 111.2 nmols/L (18.3-54.1) and ferritin was raised. TSH receptor antibody and TPO antibody were negative. Discordant thyroid function were confirmed on two platforms: Roche assay measured TSH 5.44 IU/L (03-4.2) and Free T4 45.3 pmol/L (12-22). Abbott assay measured TSH 4.42 (0.35-4.94) and free T4 29.4 pmol/l (9-19). A TRH stimulation test demonstrated a flat TSH response. MRI pituitary reported a 6mm right sided microadenoma. ^{11}C-methionine PET/CT co-registered with volumetric MRI indicating a right sided functional adenoma. He declined neurosurgical intervention. Whilst he had good biochemical control on octreotide, he was unable to tolerate due to side effects. He elected to undergo radiotherapy. At 6 months post radiotherapy his TSH 2.20 mU/L (0.27-4.20) and T4 21.9 pmol/L (7-16) and 12 months post treatment 0.98 mU/L (0.27-4.20) and T4 12.9 pmol/L (12-22). His anterior pituitary function remained intact on dynamic testing and his TSHoma involuted further. This case highlights the potential beneficial use of stereotactic radiosurgery in these rare tumours.

P38. A Case of macroTSH Presenting as Subclinical Hypothyroidism

R D'Arcy[1], K Spence[2], M McDonell[2], S Refetoff[3], SJ Hunter[1]

[1]Regional Centre for Endocrinology, Royal Victoria Hospital, Belfast 2 Endocrine Laboratory, Royal Victoria Hospital, Belfast [3] Department of Endocrinology, University of Chicago, USA

A 47 year old presented to his GP with non-specific symptoms of fatigue and weight gain. Thyroid function tests revealed elevated TSH (28.4 mU/L) with normal FreeT4 (14.3 pmol/L. A diagnosis of subclinical hypothyroidism was made and he was commenced on Levothyroxine which was titrated over 9 months to 150 mcg/d given a persistently elevated TSH. The patient was referred to Endocrinology as he was unable to tolerate this dose due to the development of sweating, palpitations, heat intolerance and insomnia. He appeared clinically euthyroid with no goitre and no eye signs. Repeat thyroid function demonstrated Free T4 26.9 pmol/L and TSH 11.67 mU/L. SHBG was elevated at 88nmol/L. Alpha-subunit was normal at 0.2 U/L. The clinical impression was of iatrogenic thyrotoxicosis with possible underlying thyroid hormone resistance, TSHoma or assay interference. Levothyroxine was discontinued and the patient re-evaluated after 6 weeks. FreeT4 normalised on cessation of Levothyroxine (13.2 pmol/L) however TSH remained elevated (20.26 mU/L). There was a normal response to TRH testing. T3 suppression testing demonstrated appropriate Free T4 suppression but persistently high TSH of 12.08 mU/L. THRβ sequencing was normal. TSH measurement by alternative assays revealed discrepant results; 12.21 mU/L (Roche Cobas) and 1.7 (Abbott Architect). PEG extraction of TSH yielded a recovery 15.7%. Gel filtration chromatography was performed and confirmed the presence of high molecular weight TSH variant alongside normal TSH. MacroTSH is a rare phenomenon that presents with spuriously elevated TSH and which may mimic subclinical hypothyroidism. Recognition of macroTSH avoids misdiagnosis and prevents inappropriate treatment.

P39. Cushing's disease presenting with severe weight loss, anorexia and refractory psychotic depression

TM McDonnell [1] , M Lockhart [1] , C Kennedy [1] , L Cussen [1] , G Roberts [2], D Smith[1], M Javadpour[3], A Agha[1]

[1]Department of Endocrinology, Beaumont hospital [2]Department of Endocrinology and Diabetes, Waterford Regional Hospital [3]Department of Neurosurgery, Beaumont Hospital Dublin

Introduction: In this paper we report an unusual case of Cushing's disease presenting with psychotic depression, paranoia, anorexia leading to severe weight loss culminating in 18% of her body weight. *Case*: A 22 year old female admitted with first episode psychosis to her local hospital displaying psychotic depressive symptoms, low mood, severe anorexia and mood congruent delusions regarding food contamination. Clinical manifestations of Cushing's were recognised: cushingoid facies, facial plethora, hirsutism with striae and proximal myopathy. The degree of weight loss (70 kg to 57 kg) and paranoid ideation surrounding food necessitated caloric supplementation parenterally. Laboratory indices notable for hypokalaemia of 2.7 nmol/l, male range testosterone level of 10.7 nmol/l, DHEAS > 27.1 umol and suppressed gonadotrophins. Urine Free Cortisol was > 25 times normal. Late night salivary cortisol was 13.4 nmol/L (< 2.6 nmol/L). ACTH was raised at 74.0 pg/ml in keeping ACTH dependent Cushing's. MRI pituitary showed a bulky pituitary. CRF testing and Inferior Petrosal Sinus Sampling both indicated pituitary dependent Cushing's disease. Following Metyrapone therapy and nutritional treatment the patient condition improved. She proceeded to transphenoidal pituitary exploration. Intraoperatively a very soft central lesion was excised and neuropathology confirmed a corticotroph adenoma. Post-operative morning cortisol at day 3 was 31 nmol/l indicating early remission. 3 months post-operative there was remarkable improvement in mood, weight, cessation of antipsychotics with normal diet and return of menses. She remained severely hypocortisolaemic 6 months post-op. Conclusion: Cushing's disease may present with severe psychiatric manifestation

and significant weight loss. Clinicians need to be vigilant of psychosis as the primary presentation of Cushing's disease.

P40. Clinical presentation, management and outcome in four cases of pituitary metastasis

A Henry[1,2], A Nugent[1], I R Wallace[1,2], B Oladipo[3], P C Johnston[1,2]

[1]Department of Endocrinology and Diabetes, Belfast City Hospital, [2]Regional Center for Endocrinology and Diabetes, Royal Victoria Hospital and [3]Cancer Centre, Department of Oncology, Belfast City Hospital, UK

Background: The pituitary gland is an unusual site for metastatic spread, clinical presentation is variable but can include visual field defects, cranial nerve palsies, anterior pituitary dysfunction or diabetes insipidus. Management options include surgery and/or radiotherapy, chemotherapy/immunotherapy or a conservative approach. Aim of Study: To report four consecutive cases of pituitary metastasis and highlight the clinical presentation, investigation, management and follow up of these patients.

Methods: Retrospective review, clinical, radiological and laboratory data was obtained from NIECR. Results: Three males and one female were included, mean age 59 years, range 18-73 years, primary disease included large B cell lymphoma, multiple myeloma, and two with an unknown primary. Initial presenting symptoms that prompted sellar imaging including headache (n = 1), cranial nerve palsy (n = 1), diabetes insipidus (n = 1) and on incidental imaging (n = 1). Endocrine dysfunction was present in 3 patients (one patient with diabetes insipidus and two patients with hypopituitarism). Treatment included two patients who received radiotherapy, one patient was offered a conservative approach, and one patient received palliative chemotherapy, no patients received neurosurgery. Survival after diagnosis ranged from 3 weeks to 19 months. Conclusions: The pituitary should not be overlooked as a site for metastasis in patients with known cancer and can be the first presentation of neoplastic disease in some patients. Given that patients are now living longer with cancer, clinicians should be alert to the varied presentation of pituitary metastasis. Earlier diagnosis and management can potentially improve quality of life and improve clinical outcomes and prognosis.

P41. Myxoedema Coma precipitated by Diabetic Ketoacidosis

C Kennedy[1], L Cussen[1], D McDonnell[1], K Allen[1], A Agha[1]

[1]Department of Endocrinology and Diabetes, Beaumont Hospital

Diabetic Ketoacidosis (DKA) precipitating a myxoedema coma is a rare phenomenon. We present the case of a 52-year-old found collapsed at home with a three-week history of polyurea, polydipsia and lassitude on a background of treated primary hypothyroidism and Type 1 Diabetes. She was hypothermic at 32 ^{o}C, hypotensive and had a GCS score of 9/15. A diagnosis of severe DKA was supported by pH 6.8, blood ketones of 6.0 and a glucose of 21.8 mmol/L. She had oliguric acute kidney injury with eGFR of 32 ml/min. Treatment was initiated as per the DKA protocol. She was sedated, intubated and commenced on continuous veno-venous haemodialysis (CVVHD). CT Brain was normal. Admission thyroid function showed TSH 9.04 mIU/L despite the inhibitory effect of severe acute illness on TSH secretion and a normal T4 of 16.3 pmol/L. Despite resolution of the DKA, her GCS did not improve post-weaning of sedation. Repeat TFTs, five days off sedation, in the euglycemic state, showed a TSH 87 mIU/L and T4 6.1 pmol/L despite receiving her normal thyroxine treatment by an NG tube. Alternative causes of a metabolic encephalopathy were excluded. 20 micrograms (mcg) of intravenous triiodothyronine was given twice daily and titrated to a mid-normal T3 level. This resulted in a rapid improvement of GCS to 15/15 after eight doses with full neurological recovery. This case highlights the challenging diagnosis of myxoedema coma and how a DKA can mask clinical and laboratory features. Poor absorption of oral thyroxine in this setting was probably a contributing factor.

P42. A Case of Immunotherapy-Related Myxoedema Coma

D Mc Donald[1], EL Goulden[1], J Crown[1], RK Crowley[1,2]

[1]St Vincent's University Hospital, Elm Park, Dublin 4 [2] University College Dublin, Belfield, Dublin 4

Thyroid dysfunction is the most common immune therapy-related endocrinopathy, manifesting either as hypo- or hyperthyroidism. While these adverse reactions are typically mild, life-threatening reactions can occur. We describe a case of immune therapy-related myxodema coma; only previously reported once in the literature. A 60-year-old woman presented with a two-month history of worsening fatigue, generalised weakness, abdominal pain and profuse diarrhoea. She had received 4 cycles of ipilimumab and nivolumab for malignant melanoma. Earlier in her treatment course she developed an immune-related thyroiditis and required thyroxine 75 mcg to manage the subsequent hypothyroidism. On examination, she was hypotensive with a BP of 60/40 despite aggressive fluid resuscitation, temperature 36.2 ^{o}C and BSL 4.0 mmol/L. She was drowsy but rousable to voice. Her skin had a creamy discoloration with prominent periorbital oedema. She was profoundly hypothyroid with a TSH of 19 mmol/L, fT4 < 3 pmol/L and fT3 < 2 pmol/L despite being fully compliant with thyroxine. A CT abdomen revealed diffuse mucosal thickening of the small bowel, consistent with an immune therapy-related enterocolitis. Thyroxine malabsorption then led to a myxoedema coma. The patient was admitted to the ICU for inotropic support for five days. She was treated with methylprednisolone 1 g OD and triiodothyronine 5 mcgs IV TDS. As her colitis improved, we were able to commence thyroxine 200 mcg and discontinue triiodothyronine after two weeks. This case describes a rare, life threatening form of hypothyroidism that arose due to the combination of two immunotherapy-related complications. It also highlights the need for close monitoring of TFTs in patients on immuno- therapy.

P43. A single centre case series of IgG4-related hypophysitis

D Mc Donald[1], J Okiro[1], McGowan A[1], LA Beha[1]n, J Gibney[1]

[1]Robert Graves Institute, Tallaght University Hospital

Hypophysitis is a manifestation of IgG4-related disease (IgG4-RD), a rare inflammatory condition characterised by multisystem infiltration of IgG4-positive plasma cells. Until recently, a lack of awareness of IgG4-related hypophysitis led to its underdiagnosis. We present five patients with IgG4-related hypophysitis from our institution. Four of the five patients were women with a mean age of 66 years at diagnosis. Four patients had biopsy-proven IgG4-RD. Patient 5 had multiple manifestations and a raised serum IgG4, however a biopsy attempt was unsuccessful. Patient 1 presented with hypophysitis and pulmonary infiltrates. Patient 2 had a preceding diagnosis of IgG4-related retroperitoneal fibrosis while patient 3 had previously been diagnosed with IgG4-related pneumonitis. He later went on to develop a pancreatic mass and an interstitial nephritis. Patient 4 presented with hypophysitis and a tubointerstitial nephritis. Patient 5 had previously been investigated for submandibular gland swelling, although the diagnosis was not made at

that point. At presentation, patients 1, 2 and 4 had panhypopituitarism and partial DI. Patient 3 had TSH and gonadotropin deficiency while patient 5 had gonadotropin deficiency, and later went on to develop ACTH deficiency. Patient 1 was treated with steroids and had a full recovery of her pituitary function. Patients 2,3,4 were treated with rituximab and prednisolone. All treated patients had radiological improvement with a reduction in size of the pituitary and stalk thickening. Patient 5 has not received immunosuppressive therapy. A high index of suspicion is required to diagnose IgG4-related hypophysitis. Thorough screening for other manifestations is required in all patients with IgG4-RD.

P44. IgG4 hypophysitis and multiorgan disease

MT Crowley[1], EM Lonergan [1], S Rafferty [1], N Berningham [2], DJ O'Halloran [1]

[1]Department of Endocrinology & Diabetes, Cork University Hospital, Cork [2]Department of Pathology, Cork University Hospital, Cork

We report the case of a 64 year old woman with lymphocytic hypophysitis and resultant panhypopituitarism whose clinical course since diagnosis was notable for a number of medical complications. Her diagnosis of lymphocytic hypophysitis was biopsy proven 2012 following referral with a symptomatic pituitary mass. In the interim, an FDG-avid pulmonary nodule warranted VATS resection and was reported as a non-malignant nodule. More recently, CT imaging of the urinary tract to identify a cause of haematuria noted a bladder lesion but on further evaluation with cystoscopy and ureteroscopy, no lesion was detected. Urine sent for cytopathology was acellular. Concurrently, a T11 vertebral lesion was biopsied and ultimately reported as benign. Most recent pituitary imaging noted stable enhancement along a thickened infundibulum. Pituitary function was re-evaluated in 2019 with glucagon stimulation test with a peak cortisol of 265 nmol/L and growth hormone of < 0.05 Ug/L. Basal measurements of LH 1.3I U/L, FSH 4.5 IU/L, TSH 0.72 mIU/L, T4 16.8 pmol/L and IGF1 63 ug/L were consistent with ongoing panhypopituitarism. In view of her persistent panhypopituitarism and clinical manifestation of inflammatory and neoplastic mimic presentations, a diagnosis of IgG-4 related disease was considered. An IgG4 level was elevated at 1.005 g/L (reference range 0.039-0.864). Her histology from initial pituitary biopsy in 2012 was re-evaluated with immunohistochemistry and demonstrated IgG4 expressing plasma cells as did the pulmonary nodule specimen. This case illustrates the importance of rigorous clinical review of patient's presentations and medical history of order to achieve accurate diagnosis.

P45. A case of panhypopituitarism in cocaine-induced ANCA vasculitis

F Shaamile[1], A McGowan[1], J Gibney[1].

[1]Robert Graves Institute, Tallaght University Hospital, Dublin 24

A 43 year old female presented with a two month history of headache, nausea, lethargy, polydipsia and polyuria. Medical history was remarkable for cocaine induced nasal/sinus destruction and ANCA positive cocaine-associated small-vessel vasculitis treated with Cyclophosphamide and Rituximab. She had a remote history of pulmonary sarcoidosis, a stable pulmonary nodule and a non-functioning left adrenal adenoma. She was hypotensive; BP 94/75 mmHg. Laboratory investigations revealed; hyponatremia, serum sodium 127 (135-145) mmol/L; central hypothyroidism, TSH 0.20 (0.3-4.2) mU/L and FT4 4.6 (12-22) pmol/L. Random serum cortisol was 14nmol/L. She was commenced on intravenous Hydrocortisone and subsequently on L-Thyroxine replacement. Urine volume increased (7 L in 24 hours) following commencement of Hydrocortisone replacement; she was diagnosed with central diabetes insipidus; serum osmolality 302 (285-295) mOsm/Kg and urine osmolality 127 mOsm/Kg and commenced on Desmopressin. The remainder of her pituitary profile demonstrated hypogonadotropic hypogonadism; oestradiol < 92 pmol/L in setting of inappropriately low FSH 2 (U/L) and LH 1 (U/L); normal serum prolactin concentration, 432 (100-500) mU/L; normal IGF-1, 16.6 (7.7-28.0) nmol/L. MRI pituitary demonstrated an enlarged pituitary gland with central hypoenhancement/ necrosis consistent with an infiltrative or vasculitic process, or hypophysitis. CT of her sinuses revealed no bony defect in the sellar floor. She was commenced on Prednisolone 30 mg daily with resolution of some components of pituitary function over 3 months; oestradiol 634 pmol/L, TSH 0.48 (0.3-4.2) mU/L and FT4 20.6 (12-22) pmol/L. Follow-up MRI demonstrated complete resolution of previously observed pituitary changes. This is the second report of a pituitary mass with panhypopituitarism in cocaine-induced ANCA vasculitis; radiologic findings fully resolved following Prednisolone treatment and there is initial evidence of restoration of pituitary function.

P46. Insulin Resistance Secondary to Autoantibodies to Exogenous Insulin

C Kennedy[1], HM Zia-ul-Hussnain[1], O Kgosidialwa[1], D Church[2], RK Semple[2], D Smith[1]

[1]Academic Endocrinology and Diabetes Centre, Beaumont Hospital, RCSI, Dublin [2]University of Cambridge Metabolic Research Laboratories, Wellcome Trust–MRC Institute of Metabolic Science, Cambridge, United Kingdom

Insulin antibodies to exogenously delivered insulin are common. Attributing insulin resistance to antibodies is valid only when present at very high titres and having out ruled more common causes. We present the case of a 37-year-old male with type 1 diabetes who had recurrent presentations to hospital in ketoacidosis. His past medical history was significant for ulcerative colitis and Grave's thyrotoxicosis complicated by atrial fibrillation, sagittal sinus thrombosis, bilateral frontal haemorrhage and resulting epilepsy. He had no features of insulin resistance or lipodystrophy. Body Mass Index was 26.2 kg/m^2. Insulin requirements averaged 324 units/day (4 units /kg) administered as insulin glulisine 70/80/74 units (Apidra®) and insulin Glargine 100 units (Toujeo®). He had no cutaneous reaction to insulin. Myeloma and insulin resistance syndromes were out ruled. Cholesterol levels were normal. Glycated haemoglobin (HbA1c) measured 107(< 42 mmol/mol), fasting C- peptide < 0.1 ug/l, fasting insulin level 219 mu/l, sex hormone binding globulin 45.6 (18.3-54 mmol/L) and adiponectin 3.9 (2.4-10.6 ug/ml). Insulin antibodies (IAb) were markedly elevated at > 200 (< 5 mg/L). Very high titers of IgG antibodies, with high affinity to bind exogenous insulin, were confirmed at 196 (< 5 ng/ml). Insulin concentrations of 24,913 pmol/L reflected a gross overestimation of biologically active insulin. Continuous glucose monitoring via Freestyle® Libre revealed significant post-prandial and nocturnal hypoglycaemia due to altered insulin pharmacokinetics and pharmacodynamics due to the insulin-IAb complex. Switching of insulin to Levemir® and Lispro improved HbA1c to 56mmol/mol and reduced insulin requirements by 40%. We await repeat antibody testing to confirm that switching of insulin reduced insulin antibody levels.

P47. A unique case of diabetic ketoacidosis as the initial presenting feature of cystic fibrosis.

M Sugrue[1], T Kyaw Tun[1], J H McDermott[1], S Sreenan[1]

[1]Dept of Diabetes and Endocrinology, Royal College of Surgeons in Ireland, Connolly Hospital, Blanchardstown, Dublin 15.

A 45 year old man presented with diabetic ketoacidosis (DKA) in the setting of a pneumonia. He had no past history of diabetes and no known family history of diabetes. He was treated for pneumonia, DKA and was commenced on a basal-bolus insulin regimen for presumed newly-diagnosed type 1 diabetes. Eight months later he was noted to have frequent hypoglycemic episodes despite minimal insulin doses, initially attributed to a 'honeymoon period'. However, antibodies to glutamic acid decarboxylase were negative. As the man's brother had recently been diagnosed with cystic fibrosis in his thirties, a diagnosis of Cystic Fibrosis Related Diabetes (CFRD) was considered. A sweat test was performed and was strongly positive. Genetic analysis confirmed the clinical suspicion of Cystic Fibrosis (CF). Further work-up showed almost complete resolution of the chest x-ray finding of pneumonia, a mild obstructive pattern on spirometry and a low faecal elastase consistent with pancreatic insufficiency. The patient was commenced on pancreatic enzyme replacement with improvement in symptoms of diarrhoea. Although CFRD is a well recognised feature of CF, DKA is thought to be rare in people with CFRD. DKA has previously been reported as the initial presentation of CFRD in a patient with known CF, but our patient was not known to have CF at the time of his initial presentation. We believe that this is the first case of CFRD presenting as DKA in a patient with no known CF history.

P48. Novel Use of SGLT2 inhibitor and GLP-1 agonist in Alstrom syndrome

S Rafferty[1], M Crowley[1], DJ O Halloran[1]

[1]Cork University Hospital, Cork

Alstrom syndrome (ALMS) is a recessive monogenic ciliopathy with a phenotype of early onset metabolic syndrome with obesity, type 2 diabetes and hyperlipidaemia, cone-rod retinal dystrophy, neurosensory hearing loss and cardiomyopathy. It involves a single gene defect of ALAMS1 gene. A family with genetically confirmed ALMS attends our endocrinology service. One member was commenced on an SGLT2 inhibitor to enhance glycaemic control post renal transplant for ESKD secondary to diabetic nephropathy in July 2018. Glycaemic control was sub-optimal post-operatively. Steroids were taken as part of immunosuppression. HbA1c two months post transplant was 72. Linagliptin and insulin therapy were added to gliclazide. Metformin was added at three months. Linagliptin was changed to semaglutide at four months. Insulin therapy was stopped after one year. Glycaemic control remained suboptimal one-year post transplant, with a peak HbA1c of 87. Empagliflozin was commenced at fourteen months and up-titrated to maximum dose by 16 months, with improvement in HbA1c to 55 at 18 months post-transplant. Addition of SGLT2 inhibitor and GLP-1 agonist greatly improved glycaemic control. This case highlights the potential role of SGLT2 inhibitors and GLP-1 agonists in genetic conditions resulting in diabetes and significant insulin resistance, as well as the safety of these agents in patients post renal transplant.

P49. Emphysematous Pyelonephritis in Hyperglycaemic Crisis

K.Liston[1], RP. Manecksha[2,3], CP. Woods[1,2]

[1]Naas General Hospital, Craddockstown Rd, Naas East, Naas, Co. Kildare, W91 AE76 [2]Tallaght University Hospital, Belgard Square North, Cookstown, Dublin 24, D24 NR0A [3] Trinity College Dublin, the University of Dublin, College Green, Dublin 2, D02PN40

Emphysematous pyelonephritis (EPN) is a rare necrotising infection of the parenchyma of the kidney. The exact incidence is not known. There is a well described association between EPN and diabetes mellitus. However, not many cases of EPN presenting with hyperglycaemic crisis have been described. A 49-year-old woman with no previous medical history presented to the emergency department in hyperglycaemic crisis precipitated by unilateral emphysematous pyelonephritis. She was found to have underlying diagnoses of diabetes mellitus (type 2) and hypothyroidism. Her computed tomography (CT) imaging was consistent with class 3 EPN with gas extending beyond the renal collecting system.[1] *Escherichia coli* was grown from blood and urine cultures. She was managed conservatively with fluid resuscitation, antibiotics, intravenous insulin, and urinary catheter insertion. Her condition improved and she was discharged home on oral antibiotics, subcutaneous insulin and levothyroxine. Close clinical and radiological follow up was arranged to monitor the need for future nephrectomy. The gold standard treatment for the management of emphysematous pyelonephritis has been a subject for debate. Previously, early nephrectomy was regarded as being essential in management but there is currently a trend toward more conservative measures. This case demonstrates the importance of the multidisciplinary team approach when dealing with conservative management of emphysematous pyelonephritis complicated by hyperglycaemic crisis. Input is required from a variety of specialities including; endocrinology, urology, radiology and microbiology. *Reference: Huang J, Tseng C. Emphysematous Pyelonephritis. Archives of Internal Medicine. 2000;160(6):797*

P50. Glycaemic control post total pancreatectomy with islet cell autotransplantation

EL.Goulden[1], D.McDonald P[1], P.Divilly[2], D. Slattery[1].

[1]St. Vincent's University Hospital, Elm Park, Dublin 4, Ireland [2.] King's College Hospital, NHS Foundation Trust, London, UK

Islet cell auto-transplantation performed at the time of total pancreatectomy has been shown to reduce the incidence of insulin requiring diabetes from almost 100% to 50% in a number of centres worldwide. A 44-year old man had an elective total pancreatectomy and splenectomy with islet cell auto-transplantation performed for disabling, idiopathic chronic pancreatitis in King's College Hospital. The patient had 50,000 equivalent islet cells transplanted through the remnant of the splenic vein with pre-infusion portal vein pressure of 5 mmHg and 8 mmHg post-infusion. C-peptide levels were 751 pmol/L pre-operatively and 36 pmol/L post-operatively indicating some residual islet cell function. Patient received diabetes education pre and post-operatively and was transitioned from IV insulin infusion to basal-bolus prior to discharge. Two months post-operatively the patient is pain free with significantly improved quality of life. He is managed on a basal-bolus regime with insulin glargine and insulin aspart with a total daily dose of 28 units/day. Patient had few hypoglycaemic episodes and was given glucose sensor for monitoring glycaemic excursions. This showed < 1% of blood sugars < 3.9 mmol/L and average blood sugars of 9.5 mmol/L. Mixed meal test was performed which showed 0 hr glucose of 15.9 and 2hr of 22.2 mmol/L with low insulin and c-peptide and HbA1c of 48 mmol/mol. While our patient still requires insulin for management of his diabetes he continues to have sufficient residual islet cell function to prevent severe hypoglycaemic events. He is scheduled for mixed meal tests at 3, 6 and 12 months post-procedure and would be expected to have further improvement in glycaemic control.

P51. A stellar case of HIST1H1E syndrome with type 2 diabetes

MS Ahmed[1], T McDonnell[1], MF Rafey[1], D Smith[1]

[1]Department of Academic Endocrinology, Beaumont Hospital, Beaumont, Dublin 9, Ireland.

HIST1H1E syndrome also known as Rahman syndrome [1] is a rare intellectual disability syndrome, with 35 reported cases, caused by protein-truncating variants in the Histone Gene Cluster 1 located at Chromosome 6p22.2 and encodes the Histone H1.4. which plays a role in DNA replication. A 20-year-old lady was referred to the young adult diabetes clinic with a diagnosis of type 2 diabetes. Her BMI was 31.4 kg/m^2, HbA1C was 76 mmol/mol and GAD antibodies were negative. She had characteristic facial appearance with widespread eyes, posterior hairline suggesting a facial gestalt and abnormal dentition. She also had a background history of hypothyroidism, mild intellectual disability, primary amenorrhea, patent ductus arteriosus, Bell's palsy and > 100 skin naevi. Clinically she also had delayed sexual development with small breasts and minimal axillary and pubic hair. Karyotyping reported normal 46XX karyotype. Ten years later, genetic testing revealed a pathogenic variant in the gene encoding the carboxy terminal part of the HIST1H1E protein which confirmed her diagnosis of HIST1H1E syndrome. There is no incidence of type 2 diabetes reported in the previous cases and therefore we would consider this as the first case of type 2 diabetes with HIST1H1E syndrome and its diagnosis in this age group has not been reported previously. *Reference: Tatton-Brown, K., et al., Mutations in Epigenetic Regulation Genes Are a Major Cause of Overgrowth with Intellectual Disability. Am J Hum Genet, 2017. 100(5): p. 725-736.*

P52. Hyperosmolar hyperglycaemic state in an adolescent cystic fibrosis patient with a background of cf related diabetes and bilateral lung transplantation.

S.T. O'Brien[1], O.M. Neylon[1], B. Linnane[1]

[1]Department of Paediatrics, University Hospital Limerick, Dooradoyle Limerick

We describe the case of a sixteen-year-old female cystic fibrosis patient with CFRD who presented in hyperglycaemic crisis nine months post bilateral lung transplantation. We also aim to highlight the difficulty in managing patients with CFRD on diabetogenic immunosuppressive medications. We describe the clinical presentation and laboratory results of the case. We also discuss management and outcome. A 16-year-old patient with cystic fibrosis presented with fatigue, polyuria, polydipsia and vomiting over several days. This was on the background of pre-existing CFRD and bilateral lung transplantation 9 months previously. On examination she had lost approximately 10% of her body weight. Her heart rate was 119 BPM and blood pressure was 118/81. Her other vital signs were within normal limits and she was clinically euvolaemic. Serum glucose was 54.8 mmol/L with pH of 7.53 and ketones 0.7. Serum osmolality was 305. A diagnosis of hyperosmolar hyperglycaemic state was made given her severely elevated blood glucose, alkalaemia and absence of ketonaemia. She was managed as per the ISPAD guidelines for paediatric HHS. She was discharged home four days post admission. While HHS is rare in the paediatric population, its incidence is rising with increased rates of adolescent obesity and type 2 diabetes. Therefore, it is important that paediatricians are aware of the clinical presentation and management as it carries significant morbidity and mortality. This case highlights the challenges in controlling blood glucose in CFRD patients who are post-transplant. Knowledge of the effect of immunosuppression on glucose control in crucial for clinicians managing diabetic patients.

P53. Does COVID cause diabetes?

I Malik[1], A Rafi [1], M Sheehy[1], U Healy[1], S Hoashi [1,2]

[1]Diabetes and Endocrine Centre, Regional Hospital Mullingar, Co Westmeath [2] UCD School of Medicine, Co Dublin

Little is known on the impact of acute COVID-19 infection on causation of diabetes. We report on a 36 years old man from Nigeria who presented with diabetic ketoacidosis (DKA) with typical osmotic symptoms of polyuria and polydipsia, fatigue and weight loss over 2 weeks. He tested positive for SARS-COV2 by PCR. The initial laboratory results: Random glucose 30.6 mmol/L, capillary blood ketones 7.4 mmol/L, pH 7.22, bicarbonate 7.5 mmol/L. Despite insulinopaenic state, at presentation, he was insulin resistant requiring several upward adjustment of IV insulin therapy, requiring over 200 units IV Actrapid infusion in the first 24 hours i.e. 8-9 units per hour. At 2 weeks, basal bolus subcutaneous insulin requirement was 1.2 U/Kg/day. Currently, 6 weeks after diagnosis, insulin requirement was lower at 0.52 U/Kg with drop in HbA1c from 125 to 67 mmol/mol. Retrospectively, random C-Peptide 0.41 ug/L (1.1-4.4) and repeated 6 weeks 0.9 ug/L, Islet cell Ab 14 U/ml (< 28), AntiGAD Ab 24 IU/ml (< 17) repeated 6 weeks 11 IU/ml. Discussion: New presentation of DKA with acute COVID-19 in a young Nigerian man. Initially insulin resistant despite insulinopaenia but resolution of insulin resistance by 6 weeks, and persistence of ketonemia despite normal acid base. Initially elevated Anti GAD Ab but six weeks later normalised. Is it latent autoimmune diabetes, or ketosis prone diabetes, or a hybrid pleiotropic metabolic effects of COVID-19 infection from as yet undefined mechanism?

P54. Two cases of catecholamine-induced cardiomyopathy managed with veno-arterial extracorporeal membrane oxygenation (VA-ECMO)

D Fennell[1], C Miller[1], C Kennedy[1], SE McQuaid[1,2]

[1]Department of Endocrinology, Mater Misericordiae University Hospital, Dublin [2]University College Dublin, Dublin

Catecholamine-induced cardiomyopathy is a dreaded complication of phaeochromocytoma with high lethality. We report two patients with phaeochromocytoma crisis and catecholamine-induced cardiomyopathy managed successfully using VA-ECMO for a mean duration of five days. Case 1, a 30-year-old female with Neurofibromatosis 1, presented with acute right-sided abdominal pain. Examination noted pallor, sinus tachycardia (150 bpm), BP 118/70 mmHg, and lung base crepitations. Emergent Computed tomography (CT) revealed a 6.3 x 5.6 x 5.4 cm right-sided adrenal mass, haemorrhagic transformation and rupture, and pulmonary oedema. Intravenous (IV) metoprolol and phentolamine led to profound hypotension and pulseless electrical activity cardiac arrest. Return of spontaneous circulation was achieved following cardiopulmonary resuscitation. In the Intensive Care Unit (ICU), VA-ECMO was initiated alongside inotropic support and volume expansion, enabling slow up-titration of alpha-blockade. Case 2, a 58-year-old female, presented with sudden onset severe chest pain, with BP 237/169 mmHg, HR 160 bpm, hypoxia and signs of pulmonary oedema. ECG showed widespread ST depression. Initial management included sodium nitroprusside infusion, rapid sequence intubation and intravenous diuresis. CT revealed an 8.4 x 6.7 x 8.0 cm haemorrhagic mass arising from the right adrenal gland. In ICU, IV phentolamine administration resulted in hypotension

requiring vasopressor support. VA-ECMO was initiated, enabling slow up-titration of alpha blockade. Both patients had markedly elevated plasma Normetanephrine (> 12600 pmol/l) and Metanephrine (> 11575 pmol/l). Successful laparoscopic adrenalectomies were performed on day 62 and 83 of admission, respectively. Echocardiography in both cases showed significant cardiomyopathy which resolved following treatment. These cases highlight the life-saving intervention of VA-ECMO and the multidisciplinary approach necessary in the management of these complex patients.

P55. Atypical Giant Parathyroid Adenoma Complicated by Prolonged post-operative Hungry Bone Syndrome

M Mustafa[1], D O'Brien[1], E Ali [1], A McGowan [1], C Woods [2], J Gibney[1]
Robert Graves Institute, Tallaght University Hospital, Dublin 24[1], Department of Endocrinology, Naas General Hospital[2]

A 42-year-old female presented with a 6-8 month history of malaise, nausea, vomiting and shoulder and back pain with a deterioration in symptoms 2 months prior to admission. Her past history was significant for hypertension and dyslipidaemia. Clinical examination demonstrated a large right sided neck mass. Laboratory investigations revealed an elevated serum calcium 3.18 (2.15-2.55) mmol/L, alkaline phosphatase 1338 (35-105) IU/L and PTH 1926 (15-65) pmol/L. SPECT/CT parathyroid demonstrated a 4 cm right neck mass representing a giant parathyroid adenoma or carcinoma. ^{9m}Tc-sestamibi scintigraphy localised a large right-sided parathyroid adenoma. Isotope bone scan revealed profoundly elevated radionuclide uptake throughout the entire skeleton with multiple lytic lesions consistent with osteitis fibrosa cystica and innumerable brown tumours. It was recommended the patient be non-weight bearing. Anterior pituitary function was normal with the exception of a low FT4 9.9 (12-22) pmol/L and her HCG was elevated 18 (< 5) IU/L. MRI pituitary was unremarkable. A right lower parathyroidectomy was performed. Histological examination of the specimen determined an atypical parathyroid adenoma weighing 44.91 grams. Genetic conditions associated with primary hyperparathyroidism were not identified. Her post-operative PTH concentration decreased within the normal range. Over the following 8 weeks, she developed significant hypocalcaemia requiring high dependency unit monitoring and necessitating between 80-100mmol/hour of calcium due to the presence of hungry bone syndrome (HBS). Attempts to wean the patient off calcium resulted in acute symptomatic hypocalcaemia prompting intensive monitoring until calcium levels stabilised. This patient had many risk factors associated with developing HBS including significantly elevated preoperative serum alkaline phosphatase and presence of skeletal manifestations of advanced hyperparathyroidism. *Reference: Witteveen JE, van Thiel S, Romijn JA, Hamdy NAT. Hungry bone syndrome: still a challenge in the post-operative management of primary hyperparathyroidism: a systematic review of the literature EJE 2013; 168; R45-R53*

P56. Extreme hyponatraemia secondary to primary polydipsia and quetiapine induced SIAD in a patient with schizophrenia.

D Mc Donald[1,2], E Brosnan[1]

[1]Dept of Medicine, Mayo University Hospital, Mayo [2] Dept of Endocrinology, St Vincent's University Hospital, Dublin

We present the case of a 57-year-old woman who developed extreme hyponatraemia while receiving inpatient psychiatric care for schizophrenia. Nursing staff noted the woman drank water excessively and, on several occasions, stopped her drinking directly from sinks on the ward. During her admission, she was commenced on quetiapine 300 mg OD. Seven days later, the patient started acting out of character and showered several times while fully clothed. Within hours, she became increasingly confused, vomited repeatedly, and collapsed. On examination, her GCS was 9, her pupils were poorly reactive, and she had a fixed gaze and her limbs were rigid in a flexed posture. Laboratory investigations revealed a sodium (Na^+) of 97 mmol/L, osmolarity 205 mmol/L and of urea 2.8 mmol/L. Glucose, TFTs and cortisol were normal. Urine Na^+ and osmolarity were 52 mmol/L and 178 mmol/L respectively. An emergency CT scan revealed diffuse cerebral oedema. The patient received two 100mL boluses of 3% saline. The serum Na^+ increased to 102 mmol/L but no neurological improvement occurred. The patient was transferred to ICU and later intubated. She had a prolonged 29-day ICU admission, complicated by two ventilator-associated pneumonias, prior to making a full neurological recovery. We outline a case of extreme hyponatraemia secondary to primary polydipsia (PP) and quetiapine-induced SIAD. The latter impaired the kidneys abilities to excrete free water allowing an extreme dilutional hyponatraemia to develop. This case describes the lowest sodium attributed to PP reported in the literature. It also highlights the importance of monitoring Na^+ when commencing or adjusting anti-psychotics, particularly in those with PP.

P57. A Case of Hypogonadotrophic Hypogonadism. A Pathogenic Role for Y Chromosome Duplications?

P.B. Loughrey[1], E.M. McConnell[1].

[1]Department of Endocrinology and Diabetes, Craigavon Area Hospital, Portadown.

Delayed puberty is a common reason for referral to endocrinology and discriminating between various aetiologies can be difficult. In younger patients constitutional growth delay and genetic disorders are high on the list of differential diagnoses. We report a young male with delayed puberty in whom genetic analysis identified duplication of all Y chromosome probes. Whilst Y chromosome duplications are rarely implicated in disease states, reporting of cases such as this may in time build evidence to confirm or refute any potential association. At age 17 years 9 months the patient presented to his primary care physician with complaints of lack of body hair and his voice not having broken. Initial investigation revealed serum testosterone < 0.2 (normal range Tanner stage 5, 6.5-30.6 nmol/L) with concomitant follicle stimulating hormone (FSH) 4.1 (1.5-12.4 IU/L) and luteinising hormone (LH) < 0.2 (1.7-8.6 IU/L).

Further assessment in the endocrinology clinic was negative for anosmia, headache or visual disturbance. There was personal history of autistic spectrum features and dental abnormalities. Height was 171.5 cm, with mid-parental height of 186.9 cm. Sparse pubic hair was present and testes were low volume. Wrist X-ray demonstrated bone age of 13 years and chromosome analysis was notable for duplication at the sites of all Y chromosome probes. He responded well to priming with testosterone and testosterone is now in the normal range without ongoing hormone replacement. FSH, however, is now elevated with normal LH. 47 XYY (Jacobs syndrome) associated with delayed puberty or more complex rearrangements remain potential diagnoses and further genetic analysis is planned.

P58. Two Cases of Intellectual Disability and Hypogonadism. An Under-Recognized Association?

P.B. Loughrey[1], E.M. McConnell[1].

[1]Department of Endocrinology and Diabetes, Craigavon Area Hospital, Portadown.

Evidence is increasing that hypogonadism can be secondary to a plethora of genetic abnormalities which may present at a young age. However,

older patients may also present with undetected genetic pathology. We present two males with primary hypogonadism detected at age 45 and 55 years who were subsequently diagnosed with 22q11.21 deletion and 48XXXY respectively. Patient A was referred from the psychiatric service due to gynaecomastia and low serum testosterone. Past medical history includes type II diabetes mellitus, subclinical hypothyroidism, unilateral renal agenesis and developmental disorder from birth. Hormonal work-up also confirmed low insulin-like growth factor 1. Adjusted calcium was normal. An ultrasound scan established both testes were present in the scrotum with no abnormal masses. Klinefelter syndrome was in the differential diagnosis and so genetic studies were undertaken. Genetic analysis identified a 1.07 Mb deletion on 22q11.21 encompassing *SCARF2, SERPIND1, SNAP29, LZTR1* and *P14KA*. Patient B was noted to have a high pitched voice during admission for lower respiratory tract infection and primary hypogonadism was confirmed. Past medical history includes obstructive sleep apnoea and developmental disorder from birth. Magnetic resonance imaging revealed bilateral atrophic testes in the inguinal regions. Karyotyping confirmed 48XXXY. Emerging evidence suggests 22q11 deletions are associated with hypogonadism and developmental abnormalities involving cardiac, neurological and genitourinary systems. 48XXXY karyotype is a well-recognized condition of high aneuploidy known to be associated with intellectual disability. Hypogonadism-associated syndromes are underdiagnosed leading to comorbidity and impaired quality of life. A high index of suspicion is required to detect such cases.

P59. Persistent ovulatory function at 30 years in Turner's Syndrome Monosomy 45:X

C Miller[1], N Phelan[1]

[1]Department of Endocrinology, St James's Hospital, Dublin

Turner syndrome is the most common chromosomal abnormality in females occurring in 1/2000-1/2500 live births with short stature and ovarian insufficiency the most common manifestations. Monosomy X is responsible in 45-50% of cases. Whilst spontaneous menses have been reported in 9.1-14% of monosomy X TS, secondary amenorrhea due to gonadal dysgenesis is considered an inevitable event. A 30 year old female was referred following observation of her short stature. Examination demonstrated height of 135 cm, BMI of 23 kg/m^2 and multiple clinical features suspicious for TS including micrognathia, webbed neck, wide carrying angle but normal secondary sexual characteristics. She reported menarche at 13 years and at the age of 30 continued to have an entirely regular menstrual cycle. Karyotype confirmed TS due to monosomy 45X. Initial hormonal evaluation confirmed persistent ovarian function with a mid cycle oestradiol of 2299 pmol/L, FSH 6.6, LH 22. Anti mullerian hormone levels (AMH) were normal 11.85 pmol/L (6.8 – 47.9) suggesting normal ovarian reserve. Further assessment of ovarian reserve with Day 3 FSH and oestradiol together with antral follicle count is awaited. DEXA revealed osteopenia. To our knowledge this is the first case of apparent normal ovarian reserve in a patient with TS due to monosomy X.

P60. Posterior Reversible Encephalopathy Syndrome associated with malignant hypercalcemia and Hypertension due to primary hyperparathyroidism

F. Shaamile[1], DJ. O'Halloran[1]

[1]Department of Endocrinology, Cork University Hospital

Posterior Reversible Encephalopathy Syndrome (PRES) is an acute neurological entity characterized by various neurological manifestations. It can be triggered by multiple aetiologies such as hypertension and rarely by electrolytes disturbances such us hypercalcemia. A 64 years old woman presented with five weeks history of nausea and vomiting. On examination she was hypertensive at 177/88 mmHg with dry mucous membranes. Other Physical and neurological examinations were normal. Laboratory investigation showed corrected calcium of 4.83 mmol/L (2.25-2.54), parathyroid hormone (PTH) of 1330 ng/l (15-68), phosphate of 1.16 mmol/L (0.8-1.5), urea of 10.7 mmol/L (2.8-8.4) , creatinine of 119 umol/L (49-90). She was rehydrated and received IV zoledronic acid. Cinacalcet was commenced and titrated up gradually aiming for corrected calcium level of 2.5-3.0 mmol/L. Ultrasound neck and parathyroid sestamibi scan showed parathyroid adenoma posterior to the right lobe of the thyroid extending into mediastinum. On day three, patient became confused and complained of complete visual loss in left eye, followed by status epilepticus which required mechanical ventilation. Patient noted to have left upper limb weakness. Brain Computed tomography was normal but Magnetic resonance imaging (MRI) showed bilateral symmetrical subcortical T2 hyperintensities in the occipital- parietal lobes consistent with PRES. Patient underwent parathyroidectomy with Post operatively PTH of 7.73 ng/L and corrected calcium 2.27 mmol/L. Repeated MRI showed resolution of PRESS. She made complete neurological recovery on discharge. DEXA scan showed Osteoporosis and patient was commenced on Bisphosphonate. This case demonstrated the importance of recognition and treatment of a hypercalcemia-induced PRES

P61. SARS-COV-2 presenting with acute adrenal hemorrhage

F. Shaamile[1], DJ. O'Halloran[1]

[1]Department of Endocrinology, Cork University Hospital

On the 31 of December 2019, the first case of COVID-19 caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV-2) was confirmed in Wuhan. We report a case of adrenal haemorrhage as a presentation in a patient with COVID-19A 61 year old male healthcare worker presented to the Emergency Department with acute abdominal pain. He had a history of hypertension which was controlled with Angiotensin II Receptor Blocker (ARB) with a BMI of 34 kg/m^2. On presentation he was agitated, hemodynamically stable and afebrile. He had a capillary blood glucose of 17 mmol/L, Serum sodium 120 mmol/L (132-144), white cells of 13.2 x 10^{12}/L (4.4 - 11.3), lymphocytes of 1.26 x 10^9/L (0.9 - 3.2) and HbA1C 59 mmol/mL (20 - 42) which confirmed a new diagnosis of type II diabetes. Abdominal Computed Tomography scan (CT) showed a 3.6 x 3.6 x 4.3 cm lesion arising from right adrenal gland with Hounsfield *Units* score of 62 and stranding of the adjacent retroperitoneal fat Suggestive of primary adrenal haemorrhage or hemorrhage into a pre-existing lesion .CT also demonstrated bibasal atelctasis and patchy bilateral lower lobe air opacification. Oropharyngeal swab tested positive for COVID-19 and patient was treated with intravenous (IV) ceftriaxone and oral azithromycin in addition to IV insulin infusion. Hypovolemic hyponatremia corrected with IV fluids. Vasculitis and coagulation screens were negative .Patient had no signs of adrenal insufficiency. Synacthen stimulation test and other adrenal secretory functions were normal. To our knowledge this is first reported case of adrenal haemorrhage in COVID-19 patient.

P62. Increasing Levothyroxine Requirements in a Patient with Previously Stable Hypothyroidism

M Batool[1], S Cadogen[1], T Kyaw Tun[1], S Sreenan[1], M Denton[2], JH McDermott[1]

[1]Academic Department of Endocrinology, Connolly Hospital, Blanchardstown, Dublin 15

[2]Department of Nephrology, Beaumont and Connolly Hospitals

A 44 year old woman presented with leg swelling. Past history included hypothyroidism and ulcerative colitis treated with eltroxin (100 ug/day) and azathioprine (100 mg/day) respectively. Clinical examination revealed pitting oedema to knees and a 'puffy face'. Free T4 was 5.8 pmol/L (12-22 pmol/L), TSH 84.61 mU/L (0.27-4.20), serum albumin 24 g/L (40-49 g/L). She reported good compliance with L-thyroxine and no recent gastrointestinal symptoms. L-thyroxine dose was increased to 150 μg daily. Further investigations revealed 4+ proteinuria on urine dipstick with normal creatinine. 24 hr urine collection showed 12 g proteinuria. Renal biopsy was performed. Light microscopy was normal but electron microscopy showed diffuse podocyte effacement. A diagnosis of minimal change disease likely secondary to NSAID exposure was made. She was commenced on prednisolone 60 mg/day, with remission of her nephrotic syndrome. Her thyroid function normalized and she reverted to 100 ug of eltroxin daily. Our patient presented with gross hypothyroidism and oedema which could have been mistaken for myxoedema. Her hypothyroidism had previously been stable on replacement, however, and she was compliant with her medication. Nephrotic syndrome results in urinary loss of free and protein-bound thyroid hormones and can result in increased thyroxine requirements[1]. When evaluating patients with increasing thyroxine requirements, nephrotic-range proteinuria should be considered in addition to causes such as poor compliance with treatment or malabsorption of thyroxine. Reference. Junglee NA, Scanlon MF, Rees DA. Increasing thyroxine requirements in primary hypothyroidism: don't forget the urinalysis!.

P63. A unique cohort with co-existent partial androgen insensitivity syndrome and familial isolated pituitary adenoma

MT Crowley[1], EM Lonergan[1], S Rafferty[1], C Joyce [2], DJ O'Halloran[1]

[1]Department of Endocrinology & Diabetes, Cork University Hospital, Cork [2]Department of Biochemistry, Cork University Hospital, Cork

Partial androgen insensitivity syndrome is a rare disorder of sexual development with X-linked autosomal recessive inheritance. The index case is a 43 year old male with low libido, erectile dysfunction and reduced shaving frequency. Hypospadias and undescended testes in childhood and gynaecomastia in adolescence required surgical correction. Family history was notable as three male siblings required assisted fertility, one of which had a history of pituitary macroadenoma with orchidopexy during childhood and maternal history of a pituitary tumour. On examination, BMI was 32 kg/m^2, axillary and pubic hair growth was Tanner stage 4-5 and bilateral testicular volume was 6-8 ml. Biochemistry revealed an elevated LH 17.6 IU/L (0.6 – 12), FSH 18.8 IU/L (1-12) and oestradiol 178 pmol/L (40-162) as well as an elevated IGF1 of 288 mcg/L (64-210). Normal results include testosterone 18.40 nmol/L (8.33 – 30.19), SHBG 29.0 nmol/L (13.5 – 71.4), prolactin 239 mU/L (73-411), TSH 1.08 mIU/L (0.35-4.94) and T4 11.0 pmol/L (9.0-19.1). Androgen receptor analysis confirmed a hemizygous pathogenic androgen receptor gene variant, c.2612C>T (p.Ala871Val), which is compatible with a of diagnosis partial androgen insensitivity syndrome. MRI pituitary was abnormal noting a 5mm pituitary microadenoma and genetic studies for familial isolated pituitary adenoma did not identify a known mutation. We highlight a case of co-existent partial androgen insensitivity and pituitary adenoma within a single family which has not been described in the literature to date. Further investigation of raised IGF-1 and pituitary microadenoma in the index case is planned with an oral glucose tolerance test. The results of the above will determine the need for further investigation of family members.

P64. A case of milk-alkali syndrome

L Kayes[1], P Norris[2], S Currie[2], M Shyamsundar[2], G M Connolly[3], H Wallace[1]

[1]Regional Centre for Endocrinology & Diabetes, Royal Victoria Hospital, Belfast. [2]Department of Intensive Care Medicine, Royal Victoria Hospital, Belfast. [3]Department of Clinical Biochemistry, Royal Victoria Hospital, Belfast.

We present the case of a 32-year-old woman who presented to the A+E department with a 2-day history of acute confusion and incoherent speech. She had a history of alcohol excess and depression. At presentation to A&E, her family reported a 2-year history of dyspepsia, unintentional weight loss of 3-4 stones over the past year and dysphagia of solid food. More recently, she had been taking 10-12 'Rennies' antacids (calcium carbonate and magnesium carbonate) a day and milk of magnesia. Blood results in A&E demonstrated a profound hypokalaemic, hypochloraemic metabolic alkalosis with profound hypophosphataemia, hypercalcaemia and acute kidney injury (pH 7.78, potassium 1.7 mmol/l, chloride 61 mmol/l, phosphate 0.12 mmol/l, adjusted calcium 4.01 mmol/l, eGFR 32 ml/min). These results were in keeping with a diagnosis of milk alkali syndrome. She was admitted to the high dependency unit for electrolyte management and monitoring. Her biochemistry normalised with intravenous potassium, phosphate and saline. Milk alkali syndrome was described in the early part of the 20th century when treatment with milk and alkali was widely adopted for management of peptic ulcer disease. The incidence much reduced with availability of proton pump inhibitor and H2 antagonists. However, there has been a re-emergence of milk-alkali syndrome over the last 20 years. This is thought to be due to increased availability of over the counter calcium supplements and calcium supplement use for osteoporosis treatment. This case has been presented as a reminder of milk-alkali syndrome and to demonstrate the extreme clinical and biochemical features which may be seen in this condition.

P65. Nephrotic syndrome following resection of an adrenal incidentaloma: a case report

M Batool[1], E Leen[2], S Glavey[3], S Sreenan[1], JH Mc Dermott[1]

Academic Department of Endocrinology[1] and Departments of Pathology[2] and Haematology[3], Connolly Hospital, Blanchardstown, Dublin 15

A 69 year old man had a 5 cm right adrenal lesion discovered incidentally while being investigated for a deterioration in previously well-controlled hypertension. Routine investigations including serum albumin were normal. Further investigation confirmed a non-functioning adrenal lesion. MRI revealed a 'non-fat-containing T1 hyperintense indeterminate adrenal lesion with speckling of T2 hyperintensity, not typical for adenoma, hyperplasia, myelolipoma, haemangioma or pheochromocytoma'. An uncomplicated laparoscopic adrenalectomy was performed. Histology revealed a 118 g adrenal neoplasm, modified Weiss score 0, with abundant hyaline deposits.3 months later the patient complained of peripheral oedema. Investigations revealed a serum albumin of 24 g/L and 14 g of proteinuria in 24 hours. Serum protein electrophoresis revealed a monoclonal IgA type lambda band. Renal biopsy revealed amorphous material displaying apple green birefringence on staining with Congo Red, which stained with antibodies to lambda light chains, confirming AL amyloid. Therefore the patient's resected adrenal specimen was retrieved and stained with Congo Red, revealing apple green birefringence in the walls of the blood vessels,

confirming the presence of amyloidosis. Although adrenal gland involvement in secondary amyloidosis is common, adrenal involvement in primary amyloidosis is less well described. This case illustrates the indolent nature of primary amyloidosis, prior to the development of often catastrophic symptoms. Consideration should be given to Congo Red staining of resected pathologic specimens containing hyaline deposition, to potentially allow for earlier recognition of this devastating disease. A pathophysiologic link between the patient's incidentaloma, adrenalectomy, and onset of nephrotic syndrome remains a matter for conjecture.

P66. A case report of 'atypical' familial partial lipodystrophy type 2 (Dunnigan type 2)

T Cronin[1], E Rasheed[1], M Mac Aogain[1], S Savage[1], E Walsh[1], APazderska[2], VEF Crowley[1]

[1]Department of Biochemistry, St James's Hospital, Dublin [2]Department of Diabetes and Endocrinology, St James's Hospital, Dublin

Familial partial lipodystrophy syndrome type 2 (FPLD2) is a rare autosomal dominant disorder, caused by mutations in LMNA gene and characterised by a partial loss of adipose tissue and associated metabolic morbidities We report a 58 year old non-obese female patient with a background of dyslipidaemia, essential hypertension, hepatic steatosis and type 2 diabetes mellitus, diagnosed sixteen years earlier and which had been difficult to control. Clinical examination demonstrated an unusual body habitus with decreased fat deposition in her upper limbs, and a particularly marked appearance of bilateral lower limb pseudohypertrophy. There was increased abdominal adiposity and truncal skin tags but no evidence of acanthosis nigricans. A family history of diabetes was noted but not of FPLD, however, specific mutation scanning of *LMNA* and *PPARG* identified heterozygosity for the pathogenic variant p.R582C in *LMNA*, confirming a diagnosis of 'atypical' FLPD 2. Further investigation demonstrated a hypoleptinaemic state in this patient. Considerable phenotypic diversity in FLPD 2 patients has been reported depending on the *LMNA* variant present. Typical FPLD has been associated with more severe metabolic phenotypes and the presence of AN, whereas 'atypical' FPLD is associated with a milder phenotype, including the absence of AN with lipodystrophy being more evident in lower limbs, again observed in our patient. Although rare, it is important to consider FPLD in patients presenting with metabolic syndrome and an unusual physique or a family history of diabetes. Furthermore, clinical examination of upper and lower limbs for pseudohypertrophy is a very important consideration in such patients.

Diabetes, Obesity and Metabolism

P67. The Oral Glucose Tolerance Test – is it time for a change? – A literature review with an emphasis on pregnancy

D. Bogdanet[1, 2], PM. O'Shea[1, 3], C. Lyons[3], A. Shafat[1], F. Dunne[1, 2]

[1]School of Medicine, National University of Ireland Galway, Ireland. [2]Saolta University Health Care Group (SUHCG), University Hospital Galway, Galway, Ireland.[3]Department of Clinical Biochemistry, SUHCG, University Hospital Galway, Galway, Ireland.

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P68. Vitamin D Status in Women with Gestational Diabetes Mellitus

M Janquli[1], S McGettigan[1], MJ Brassill[1]

[1]South Tipperary General Hospital, Clonmel

The aim of this study was to assess vitamin D status in women with gestational diabetes mellitus (GDM). Vitamin D has a modulatory role in insulin secretion and action and is potentially relevant for development of GDM. Observational studies have shown associations between low vitamin D levels and GDM. A total of 74 women diagnosed with GDM were included. Serum 25(OH)D levels were assessed at diagnosis (median week 25 gestation) and labelled as sufficient (> 50 nmol/L) or insufficient (< 50 nmol/L). We subdivided these groups into those checked in winter (October-March) or summer (April-September). In total 40 patients (57%) had sufficient levels of vitamin D; 29 (72.5%) of these had levels checked in summer. The remaining 34 (43%) patients had insufficient levels of vitamin D; 14 (41%) of these were assessed in summer. In total, of those assessed in summer 33% were insufficient, and of those assessed in winter 65% were insufficient. A recent Cochrane review has suggested that supplementation with Vitamin D during pregnancy may reduce the risk of gestational diabetes and its related complications such as preeclampsia. [1] Only 57% of women with GDM in our cohort had sufficient vitamin D and the majority (72.5%) of those were checked in summer. Almost two thirds of those assessed in winter had insufficient vitamin D levels. Despite recommendations for vitamin D supplementation in all pregnant women, our study indicates high levels of insufficiency in women with GDM, in whom it may be a causative factor and may also increase risk of complications. *Reference: Palacios C, Kostiuk LK, Peña-Rosas JP. Vitamin D supplementation for women during pregnancy. Cochrane Database Syst Rev 2019; 7: CD008873*

P69. Prevalence and Recognition of steroid induced hyperglycaemia in Midland Regional Hospital, Tullamore

H Khan[1], A Kumar[2], I Ullah[3], H Ali[4], M U Anwar[5], P J Murphy[6], Y Guirguis[7].

Midland Regional Hospital Tullamore, Tullamore, Co. Offaly

Glucocorticoids are widely used for their potent anti-inflammatory and immunosuppressive properties across various specialities. However, one of their major side effects is worsening hyperglycaemia in patients with and without known diabetes which leads to prolongation of hospital stay, increase in hospital acquired infection, higher incidence of intensive care admissions and overall increased patient mortality. We believe that it is overlooked and not adequately monitored. Therefore, this study is conducted to evaluate if steroid induced hyperglycaemia is being adequately monitored and recognized when compared with Joint British Diabetes Societies inpatient care guidelines. It is found that the total number of patients were 46 in which 8 were type 2 diabetic (8/46, 17.39%) & 38 were non diabetic (38/46, 82.6%). The number of patients monitored were 8 (8/46, 17.4%), in which 3 were diabetic and 5 were non diabetic, while the number of patients who remained unmonitored were 38 (82.6%). Out of 8 monitored patients, 4 patients developed steroid induced hyperglycaemia in which 3 were diabetic (3/4, 75%) and one was non diabetic (1/4, 25%). In conclusion the incidence of steroid induced hyperglycaemia in those diabetic patients whose blood glucose were monitored remained significantly high, however more than half of the diabetic patients blood glucose remained unmonitored. Similarly, a very small proportion of non-diabetic patient's blood glucose were monitored and hence steroid induced hyperglycaemia could not accurately be evaluated. This raises the issue of poor compliance of blood glucose monitoring in patients on steroids (diabetic and non-diabetics).

P70. The impact of multi-disciplinary input on glycaemic control over time in children on intensive insulin therapy using real world prospectively collected data

J Foran[1], E Somers[1], D Cody[1], SM O'Connell[1]

[1]Diabetes and Endocrine Centre, Childrens Health Ireland, Crumlin

Aims: To investigate the factors impacting on glycaemic control over time including treatment type, educational input and patient demographics within an Irish tertiary paediatric diabetes centre. Methods: Using a prospectively maintained database of clinical encounters, data was analysed in age matched pairs from 2007 to 2019. Pairs were matched by insulin treatment type (pump v multiple daily injection (MDI)). Matching was performed on the basis of gender, current age, age at diagnosis and HbA1c at pump commencement. Panel data regression was performed on the entire sample and analysed for the impact of differing insulin regimens by gender, age and duration of diagnosis. This model was then used to assess the impact of intensive re-education sessions on HbA1c. Results: From 999 patients there were 104 matched pairs. Compared to MDI, matched pump patients had a lower HbA1c 6 months after commencement [Difference in HbA1c = 0.60% p <0.01], this effect persisted to 8 years [0.57% p = 0.01]. Panel data analysis showed CSII therapy reduces HbA1c by 0.57% relative to MDI therapy ($p < 0.001$). Patients who required intensive re-education showed a HbA1c 0.91% greater than otherwise identical patients prior to re-education, after these sessions HbA1c drops by a statistically significant 0.79% ($p < 0.001$). Conclusions: Compared to matched peers on MDI treatment regimens, patients on pump therapy showed significant improvements in HbA1c which was an effect sustained up to 8 years. Panel data regression confirms these findings and in addition shows that intensive re-education is associated with a significant drop in previously elevated HbA1c levels.

P71. Two years post-introduction of centrally-funded Flash Glucose Monitoring in Paediatric Type 1 Diabetes: A regional centre's experience

RA Carey [1], CS Costigan [1], N Dunworth [1], M Norris M[1], CS O'Gorman [1,2], OM Neylon [1, 2]

[1]Department of Paediatrics, University Hospital Limerick [2]Graduate Entry Medical School, University of Limerick

The *FreeStyleLibr*e Flash Glucose Monitoring system (FGMS) continuously measures glucose concentration in the interstitial fluid. It was approved under the Community Drug Scheme in Ireland from 1st April 2018 for all children ≥ 4 years with Type 1 Diabetes (T1D) using intensive insulin regimens. We explored the effect of FGMS introduction on our paediatric clinic cohort, including engagement of patients with technology, compared to the rest of our patient cohort who did not opt to use FGMS. Over a two year period, HbA1c at quarterly intervals from 3 months pre to 24 months post introduction of the FGMS were examined. Data were extracted from 'Libreview'. Of 235 patients, 108 patients (46%) commenced using FGMS; 58 (54%) male and 50 (46%) female. Thirty two (30%) were using continuous subcutaneous insulin infusion (CSII) and 76 (70%) injectable regimes. Mean HbA1c in the cohort initially improved across the study period from 8.2 ± 1.1% at 3 months prior to 7.6 ± 0.9% at 9 months post-initiation, but had reverted to 8.4 ± 0.8% at 2 years(FGMS) Vs 8.2 ± 1.5% in the non-FGMS cohort (p = 0.4). Technology engagement increased, with 34 downloading data at 1 year and 52 (48%) at 2 years. Scans per day increased from 6.0 to 7.1 (p = 0.42) and percentage usage increased from 55% to 63% (p = 0.22). Improvement was demonstrated initially in mean HbA1c over time, however no difference was demonstrated in HbA1c of cohorts at 2 years post-initiation. Engagement with uploading data was initially low. This increased during 'lockdown' although didn't translate to improved glycaemic control.

P72. Personalised Care Programme Reduces Liver Stiffness in NAFLD Patients and Reduces Need for Cirrhosis Surveillance.

C Cavey[1], S Norris[2], M Griffin[3]

[1]UCD Medical School (final year medical student at time of study), [2]SJUH/TCD [3]Beacon Hospital/UCD Beacon Academy Endocrinology and diabetes Beacon Hospital Dublin 18

NAFLD is increasingly common and significantly increases the risk of liver cirrhosis and HCC. However, hepatic steatosis is largely reversible and easily identified using transient elastography, Fibroscan™ (FS). We conducted an anonymised, retrospective review of cases referred for FS over a 24 month period. All patients were scanned by hepatology and enrolled in weight loss program with endocrinology. The aim of this review was to assess if weight loss improved Fibroscan™ derived liver stiffness scores and impacted hepatology follow-up.14 patients with mean age of 51.43 (± 9.7374) and male/female ratio of 6/8, were referred for Fibroscan, treated and later re-scanned. 13 of these patients were obese (BMI>/=30) of whom 10 had abnormal LFTs, 1 was overweight (BMI > 25 < 30) with abnormal LFTs. We compared Liver Stiffness Scores (LLS) and CAP scores of these patients before and after interventions that included dietician consultation, metformin and in 9 cases GLP-1 receptor agonists. Weight fell from 116.9 kg ± 40.5 to 107.3 ± 37.23 $p < 0.01$; mean BMI fell from 40.49 ± 9.17 to BMI 37.23 ± 8.25 $p < 0.01$. LLS fell from an average of 13.2 (± 7.14) to 8.74 (± 4.87) (p-value 0.0246) while CAP fell from an average of 337.91 (± 51.44) to 293.58 (± 59.51) (p-value 0.0018). 13 of 14 patients had significant fibrosis prior to weight loss with indication for HCC follow up. Following an average 8.2% weight loss only 8 of 14 patients required such follow up. FS has the potential to de-escalate the need for additional tests in these subjects.

P73. Real World Experience with Liver Fibroscan in Obese Patients

C Cavey[1], S Norris[2], M Griffin[3]

[1]UCD Medical School (final year medical student at time of study), [2]SJUH/TCD [3]Beacon Hospital/UCD Beacon Academy Endocrinology and diabetes Beacon Hospital Dublin 18

NAFLD is a common health problem. NASH, its progressive form, increases risk of liver cirrhosis and HCC. Liver biopsy is the gold standard for the staging of NAFLD but transient elastography, Fibroscan™ (FS) is a useful non-invasive methodology to assess hepatic fibrosis. We conducted an anonymised retrospective review of all cases referred for Fibroscan examination over a 24 month period from our clinic. All patients were reviewed and scans reported by a consultant hepatologist. 46 patients were referred for FS with mean weight and BMI of 117.15 kg and 40.94 respectively, mean age of 52.07 and a male/female ratio of 13/33. 4 patients were overweight (BMI > 25 < 30) with abnormal LFTs and 42 patients were obese (BMI>/=30) with only 26 demonstrating abnormal LFTs. Mean CAP was 314.18 (SD 48.2103 and normal CAP range < 220 dB/m) and mean LSS was 10.6869 (normal range 2.5-6.5 kPa). 17 of 47 required referral to hepatology clinic with advanced fibrosis, 13 of 47 had mild to moderate fibrosis requiring annual scanning and 14 of 47 had raised CAP scores with normal LSS and only 1 patients had normal CAP and LSS. As expected, a significant majority of this cohort demonstrated NAFLD. FS assessment identified more patients with fatty liver changes than LFTs. Liver stiffness (a marker of fibrosis) was identified more frequently than expected classifying patients with NASH triggering

hepatology review. Our data shows that FS is a useful tool in identifying patients at high risk of NASH and its complications which can risk stratify for hepatology referral.

P74. Integrated scoring system for the detection of advanced liver fibrosis in individuals with T2DM.

S Burke[1], O Kiely[1], J Jose[1], C McHugh[1], S Bacon[1].

[1]Department of Diabetes & Endocrinology, Sligo University Hospital, Sligo

People with type 2 diabetes (T2DM) are recognised to be a cohort with a high incidence of metabolic associated fatty liver disease (MAFLD), previously known as non alcoholic fatty liver disease. The majority of patients with MAFLD will not progress to cirrhosis. To guide resource allocation, scoring systems such as the FIB-4 and NAFLD scores have been developed to identify those at risk of progression. The cohort of people T2DM attending Sligo University Hospital endocrine service has not previously been systematically evaluated for MAFLD. Using our online diabetes database and a validated risk assessment tool (FIB-4), we attempted to identify patients at higher risk of cirrhosis, and assess whether they had previously been evaluated with liver imaging and/or gastroenterology referral. Of the 1086 people with T2DM who attended OPD in 2019 we identified 176 (16%) patients over 35 year old, that had both an ALT > 33 IU/L and a BMI > 25. Applying the FIB-4 tool to this cohort, with age adjusted cut offs, we identified 57 patients (5%) with a score that warranted further investigation. Within this group 15 (1.3%) had a score that suggested advanced fibrosis. Of the 57 at risk patients, 22 had previous liver imaging, and 15 had previously been referred to our local gastroenterology service. Of the highest risk group, 8 had had imaging and 2 had previously been referred to gastroenterology. In future we plan to integrate a FIB-4 score into our diabetes management software to identify at risk patients and guide therapeutic interventions.

P75. Effects of a single-centre lifestyle modification programme on anthropometric, metabolic, and cardiovascular risk factors in adults with severe obesity.

JF Brazil [1], I Gibson [2,5], D Conway [2,5], D Dunne [2,5], M Bakir [1], D Keegan [2,5], C Collins [3], B Maguire [1, 4], M Hynes [1,4], S Foy [1], S Seery [5], P Bassett [2], C Davenport [1], FM Finucane[1].

[1]Bariatric Medicine Service, Centre for Diabetes Endocrinology and Metabolism, HRB Clinical Research Facility, Galway University Hospital, Galway, Ireland. [2]Croi, the West of Ireland Cardiac Foundation, Heart and Stroke Centre, Moyola Lane, Newcastle, Galway, Ireland. [3] Department of Upper Gastrointestinal Surgery, Galway University Hospital. [4] School of Psychology, National University of Ireland, Galway, Ireland. [5]National Institute for Prevention and Cardiovascular Health (NIPC), Galway

Background: Structured lifestyle modification programmes are offered as first line treatment to patients referred to bariatric specialist services. We sought to describe changes in anthropometric and metabolic characteristics in a cohort of bariatric patients following completion of an eight-week, multidisciplinary group-based lifestyle intervention focussed on diet and physical activity. Methods: We conducted a prospective cohort study of all patients who completed the programme from 2013-2019. Weight, body mass index, blood pressure, HbA1c, lipid profile and functional capacity (Incremental shuttle walk test) at baseline and follow-up were compared in per-protocol analyses. Results: Of 1122 patients enrolled in the program, 877 (78.2%) attended for follow up measures. Mean age was 47.3 ± 11.9 years and 66.9% were female. BMI decreased from 47.0 ± 7.8 to 46.2 ± 7.8 kgm^{-2} ($p < 0.001$), weight decreased from 131.6 ± 25.5 to 129.5 ± 7.8 Kg ($p < 0.001$) and the number of patients achieving HbA1c < 53 mmol/l increased from 79.4% to 83.6% ($p = < 0.001$). There were also improvements in blood pressure, lipid profiles and functional capacity: MET (metabolic equivalents of thermogenesis) max 5.6 ± 2.1 vs 7.0 ± 2.8 ($p = < 0.001$). Conclusions: Adults with severe and complicated obesity referred from a hospital-based bariatric service who completed eight weeks of supervised, group-based structured lifestyle modification had improvements in anthropometric and metabolic characteristics consistent with a reduction in cardiovascular risk.

P76. What is the clinical entity of 'atypical' familial partial lipodystrophy type 2? A review of genetic databases and published literature

T Cronin[1], E Rasheed[1], M Mac Aogain[1], S Savage[1], E Walsh[1], VEF Crowley[1]

[1]Department of Biochemistry, St James's Hospital, Dublin

Familial partial lipodystrophy type 2 (FPLP2) is a rare condition associated with allelic variants on the *LMNA* gene. The "typical' FPLD2 phenotype is associated with a variant 'hotspot' affecting codon 482, while 'atypical' sub-types constitute all other allelic variants associated with FPLD2 phenotypic expression. To further elucidate any putative differential manifestations of FPLD2, the genotype-phenotype correlation underpinning this genetically heterogeneous condition was reviewed using genetic databases and published literature. In addition, the prevalence of FPLD2-related *LMNA* variants in population-based variant databases was examined. Two genetic databases, *'DisGeNET'* and '*The Human Gene Mutation Database*', were reviewed to gather known missense heterozygous variants associated with FDLP2. Literature searches were subsequently performed to find peer-reviewed phenotypic data associated with FPLD2 variants. The frequency of the allelic variants present in genomic datasets ('*gnomAD v2.1.1*' and '*DiscovEHR*') was also investigated. Twenty-nine missense variants were identified with supported FPLD2 phenotypic associations, of which three were related to 'typical' forms. The phenotype associated with the 'atypical' variants was wide ranging, with features in common and absent in the 'typical' form. Ten out of the 29 variants had a reported allele frequency between 0.000004 - 0.0004366 in either of the databases. Moreover, a minimum prevalence of 1/14000 and 1/5600 was estimated in *gnomAD v2.1.1'* and '*DiscovEHR'* respectively. FPLD2 presents as a heterogeneous clinical condition, and the classification of 'typical' and 'atypical' forms represents a phenotypic oversimplification. Furthermore, although it is a rare disease, our findings indicate that it may be more prevalent than previously reported.

P77. Diabetes and Lower Extremity Amputations in Ireland: A registry-based study

A. Mealy[1], S. Tierney[2], J. Sorensen[3]

[1]The Royal Hospital, Perth, Australia [2]Tallaght University Hospital, Dublin [3] Health Outcome Research Centre, RCSI, Dublin

The objective of this study was to analyse the association between diabetes and lower extremity amputations (LEA) in Irish public hospitals. The potential savings for reducing numbers were assessed if a national multi-disciplinary foot protection clinic (MDFPC) were established nation-wide. Patient characteristics of LEA conducted during 2016-2019 were analysed based on discharge data from the national hospital inpatient enquiry system. Reported consequences from existing literature

were used to extrapolate national consequences. Public hospitals registered 3104 hospital admissions with LEA during 2016-2019. 68% (n = 2099) of these were minor amputations. 76% (n = 1592) of minor amputations and 50% (n = 1005) of major amputations were performed on patients with a diabetic diagnosis. If the implementation of a national MDFPC programme could reduce the number of diabetic amputations by 20% 80 minor and 26 major amputations could be avoided annually. This would avoid nearly 3000 hospital bed days and correspond to a potential annual saving of €3M. LEA have a severe impact on patients' lives and hospital resources. Potential savings from effective prevention strategies may offer both health improvements and cost-savings.

P78. Changes in weight in adults with obesity taking semaglutide: a single-centre retrospective cohort study

G Mannion [1,2,3], S Foy [1], D Fitzsimons [1], T Yong [1], R Davern [1], D Bogdanet [1,2,3], T McDonnell T, FM Finucane [1,2,3], C Davenport [1,3.]

[1]Bariatric Medicine Service, Centre for Endocrinology and Metabolism, University Hospital Galway, Galway [2] HRB Clinical Research Facility, National University of Ireland, Galway[3] Department of Medicine, National University of Ireland, Galway

In patients with obesity weight loss ≥ 10% is associated with significant health improvements. Currently there are few medications which are effective, safe and available for treating obesity. In our hospital-based regional bariatric referral service semaglutide is used (maximum 1.0mg) in patients with and without (off-label use approved by the drugs and therapeutics committee) type 2 diabetes mellitus (T2DM). We sought to describe changes in weight in bariatric patients who were prescribed semaglutide at our centre. We performed a retrospective review of patients who commenced semaglutide for management of obesity from September 2018-September 2020 and who consented to data access, adhering to STROBE guidelines. Patients were included in the analysis if they provided data after ≥ 5 months. Data were analysed using GraphPad Prism. Of 203 patients who commenced semaglutide, 30 (14.8%) patients stopped the drug with 10 (5%) stopping due to gastrointestinal effects. Of the remaining 173 patients, 115 had weight data available after ≥ 5 months on semaglutide. This cohort had a mean age±SD of 49.5 ± 11.1 years, 85(73.9%) were female and 45 (39%) had T2DM. The baseline weight of 130.5 ± 23.3 kg decreased to 117.8 ± 23.4 kg at a median of 7 months (IQR6-10), equivalent to a reduction of 12.7 ± 9.4 kg ($p < 0.0001$) and ≥ 10% weight loss in 50.4% of patients. Those with T2DM lost less weight than those without (- 10.8 ± 9.8 kg versus - 13.9 ± 9.1 kg, $p < 0.05$). Notwithstanding the limitations of a "per protocol" analysis in a retrospective study without a control group, our results give an indication of the effect size of semaglutide on weight in a cohort of Irish patients with obesity.

P79. Male Pituitary-Gonadal Axis Function in Obstructive Sleep Apnoea Syndrome:

The Effect of Continuous Positive Airway Pressure

R Leigh[1], SM Hamon[2], M McWeeney[3], P O' Shea[4], A O' Loughlin[5].

[1,5]Bon Secours Hospital, Galway. [2]Ryan Institute, NUIG. [3]Galway Clinic Hospital [4]Clinical Biochemistry Department, Galway University Hospital.

Obstructive sleep apnoea syndrome (OSAS) is common; disproportionately affecting the overweight and obese. Continuous positive airway pressure (CPAP) is the first-line treatment for moderate to severe OSAS. Clinical equipoise exists as to whether CPAP treatment directly affects pituitary-gonadal hormone synthesis. This study aimed to determine the effect of CPAP treatment on gonadotropins, prolactin, sex-hormone binding-globulin (SHBG), total testosterone (TT) and calculated free testosterone (cFT) in male OSAS patients. Following written informed consent, participants provided venous blood samples before and twice after (first night of CPAP, n = 25 and 3 months of CPAP, n = 13) commencing CPAP treatment. At each time-point, concentrations of TT, SHBG, prolactin and gonadotropins were measured. In total, 53 males with a diagnosis of OSAS confirmed by polysomnography were prospectively enrolled to this study. Hypogonadism was uncommon (n = 2). Hyperprolactinaemia was prevalent (n = 25). TT and cFT were significantly negatively correlated with obesity. cFT was negatively correlated with worsening OSAS severity, but not TT. Paired samples t-tests demonstrated significant reductions in TT (pre 16.6 nmol/L, post 13.5 nmol/L, p = 0.003), cFT (pre 332 pmol/L, post 250 pmol/L, p = 0.001) and prolactin (pre 360 mIU/L, post 225 mIU/L, p = 0.006) after 3-months of CPAP (n = 13). No significant change was observed in other pituitary hormones or SHBG. The prevalence of hypogonadism is low in this cohort. CPAP treatment reduced testosterone and prolactin in eugonadal males with OSAS. The benefits of CPAP treatment for OSAS may be independent to change in serum testosterone levels. Hypogonadal OSAS patients should be managed via strategies other than CPAP alone.

P80. A mixed method investigation of habitual physical activity levels in children with type 1 diabetes.

S Giblin [1], P Scully [1], J Evers [1], N Dalton [1,2], O Neylon [,2], G Hayes, [1], A. Donnelly[1],CS O'Gorman [1,2]

[1]University of Limerick [2]University Hospital Limerick

Diabetes mellitus type 1 (T1D) affects over 2,500 children in Ireland. In addition pharmacotherapy, research has shown that physical activity can be an important component of T1D management. However a significant proportion of children with T1D remain physically inactive. To date, surveillance of physical activity in children with T1D for both research and clinical purposes has relied solely on self-report. This study deployed both quantitative and qualitative measures to assess habitual physical activity patterns in children with T1D. Quantitative (accelerometry using 8 day wear protocol) and qualitative (validated self-report questionnaire - BAPAD1) methods were used. 21 participants (9 females, 12 males) between 10 - 17 years (mean 13.7 years) were recruited from the Outpatients Diabetes Clinic in UHL. Total steps, METS per hour, sedentary bouts and sedentary duration were recorded. Mean total steps were recorded as 8,220 per day, mean daily METS = 27.80, sedentary bouts > 30 mins = 6.16, mean sedentary duration (during waking hours) = 365mins per day. The findings of this study show participants are not achieving the required steps per day to sustain physical health (recommended minimum 11,500, average recorded 8,220). Furthermore, there is a discrepancy between perceptions of activity levels and actual activity levels indicating a need for further education for children and parents of children with T1D. The purpose of this study was to pilot methodologies for further empirical research. Further research is warranted to contribute to the understanding of physical activity prescription for the management of T1D.

P81. Attendance at OPD and Freestyle Libre flash glucose monitor uptake amongst the SVUH CFRD Cohort in 2019

J Noble [1], S Hatton [1], M Costa Blasco [1], M Gleeson [2], RK Crowley [1].

[1]Department of Endocrinology, St Vincent's University Hospital, Elm Park, Dublin 4 [2]Department of Respiratory Medicine, St Vincent's University Hospital, Elm Park, Dublin 4.

40-50% of adult patients with CF have CF related diabetes (CFRD), which is associated with impaired lung function, increased frequency of exacerbations and adversely impacts survival. Early intervention in CFRD improves outcomes. The American Diabetes Association recommend patients with CFRD be seen quarterly by a multidisciplinary team with expertise in both diabetes and CF. This audit was initiated based on a previous audit of this service in 2015, which noted that just 30% of patients attending the CF service were attending CFRD outpatient clinic. This retrospective audit pertains to the period 01/01/19 to 31/12/19. In addition to auditing the frequency of appointments offered and attended, we audited the proportion of patients using flash glucose monitoring (FGM) and thus the proportion of patients who would potentially be in a position to engage with services remotely as a means to achieving more frequent review. 98 patients with CFRD were eligible to attend CFRD clinic (n = 98), 57% of these patients were offered at least one appointment. 61% of those offered an appointment attended the clinic at least once (n = 34), this represents just 35% of the total eligible patient population. No patient attended more than twice. 18 patients failed to attend their appointment without advance notice on at least one occasion (32% of those offered an appointment). 36 patients were using a Freestyle Libre flash glucose monitor (36.7%). Further work is required to investigate the reasons underlying this low rate of attendance and to redesign the service accordingly to meet international guidelines.

P82. Changes in the Leptin to Adiponectin Ratio are Proportional to Weight Loss after Calorie Restriction in Adults with Severe Obesity.

M F. Rafey[1,2,3], R Abdalgwad[1,2,3], P M. O'Shea[4], S Foy[1], B Claffey[1], C Davenport[1,2,3], D T. O'Keeffe[1,2,3], F M. Finucane[1,2,3].

[1]Bariatric Medicine Service, Centre for Diabetes, Endocrinology and Metabolism, Galway University Hospitals, Galway, Ireland.[2]HRB Clinical Research Facility, National University of Ireland Galway, Ireland.[3]Department of Medicine, National University of Ireland Galway.[4]Dept. of Clinical Biochemistry, Galway University Hospitals, Galway, Ireland.

Hypocaloric diets are known to induce changes in adipokine secretion in patients with severe obesity, but the influence of a milk-based meal replacement programme on the leptin: adiponectin ratio (LAR), a measure of insulin resistance and cardiovascular risk, has not previously been described. We conducted a prospective, single-centre cohort study of adults with severe obesity (defined as body mass index (BMI) ≥ 40 kgm^{-2}, or ≥ 35 kgm^{-2} with co-morbidity) who completed a 24-week milk-based meal replacement programme. We measured leptin, adiponectin and LAR at the start and on completion of the programme. Of 120 patients who started, 52 (43.3%) completed the programme. Their mean age was 50.3 ± 11.2 (range 18-74) years, 29 (55.8%) were female and 20 (38.5 %) had type 2 diabetes mellitus (T2DM). Weight decreased from 148.2 ± 39.6 to 125.4 ± 34.8 kg and BMI decreased from 52.4 ± 11.1 to 44.3 ± 9.8 kgm^{-2}, respectively (all $p < 0.001$). In patients with T2DM, HbA1c decreased from 60.0 ± 17.4 to 47.5 ± 15.5 mmol/mol ($p < 0.001$). Leptin decreased and adiponectin increased, with a reduction in LAR from 15 [8.4, 22.4] to 5.7 [3.0, 9.1] ng/μg ($p < 0.001$). Overall, the amount of weight lost was strongly associated with the change in LAR (ß=2.94, $p < 0.001$), more so in T2DM patients. Patients with severe obesity who completed a milk-based hypocaloric meal replacement programme had a substantial reduction in their LAR, consistent with decreased insulin resistance and a likely reduction in cardiovascular risk. The magnitude of these changes was proportional to how much weight was lost.

P83. Inpatient Glycaemic Control is Poor in Patients Receiving Insulin Therapy

N Reidy[1], MC O' Donovan[1], MJ Hannon[1].

[1]Department of Endocrinology and Diabetes, Bantry General Hospital, Bantry, Co. Cork.

Tight inpatient glycaemic control improves outcome but is difficult to achieve, especially in those on insulin. We prospectively reviewed the capillary blood glucose (CBG) control of hospital inpatients receiving insulin to determine their level of control and to examine healthcare providers' responses to dysglycaemia. Between March and June 2020, all patients on insulin admitted to Bantry General Hospital for more than 24 hours were reviewed. CBG recordings were individually categorised as either hypoglycaemic (CBG < 4 mmol/L), euglycaemic (CBG = 4–9.9 mmol/L), mildly hyperglycaemic (CBG = 10–14 mmol/L) or severely hyperglycaemic (CBG > 14 mmol/L). Each patient's individual insulin dose was reviewed and compared with their concurrent CBG level and categorised as either appropriate or inappropriate. 16 patients were enrolled with 497 CBG checks recorded over 108 patient days; average length of stay was 6.6 days. CBG was checked fewer than 4 times per day on 35 patient days. 355 CBG checks were in the euglycaemic range; but only 3 patients were euglycaemic throughout admission. 17 hypoglycaemic events occurred in 5 patients and 125 hyperglycaemic events occurred in 13 patients. All 5 patients that had hypoglycaemic events also had hyperglycaemic events. Of the hypoglycaemic events recorded, only 12/17 were treated appropriately. Only 77/125 hyperglycaemic events were managed appropriately. 6 prescribing errors were recorded. Inpatient glycaemic control was suboptimal in the majority of patients and dysglycaemia, especially hyperglycaemia, remains problematic. Insulin doses were not adjusted often enough or dramatically enough. Further NCHD and nurse education is required in this area.

P84. Evaluating the prevalence, recognition and management of steroid-induced hyperglycaemia in a large tertiary referral hospital

J Fuller [1], A Tuthill [1,2]

[1]Department of Medicine, University College Cork, Cork. [2]Department of Endocrinology, Cork University Hospital, Cork.

Aim: To evaluate if steroid-induced hyperglycaemia is being adequately managed in a large tertiary referral hospital. Methods: This retrospective cross-sectional study was carried out on 94 adult general medical and surgical in-patients in Cork University Hospital (CUH) who were currently receiving corticosteroids. Information

on their demographics, glucose levels, glucose management, pre-existing diabetes, HbA1C levels, steroid doses and co-morbidities was obtained via chart review. In patients who demonstrated abnormal glucose levels, we aimed to establish what corrective measures were taken, and whether a previous diagnosis of diabetes influenced these. Data was analysed using SPSS v25. A p value of < 0.05 was deemed to be statistically significant. Results: Of the data collected from 94 patients, 51 patients (54.3%) had their glucose monitored. Of these 51 patients, 29 (56.9%) exceeded the normal limit of fasting glucose levels of 7mmol/l, as per the WHO guidelines. In terms of management of hyperglycaemia, those with known diabetes receiving insulin treatment were seen to have their dosage increased. However, in those not receiving insulin and in non-diabetics, there appeared to be a reluctance to add medications. A previous diagnosis of diabetes, a HbA1c level > 48 mmol/L and the use of insulin were determined as independent risk factors for steroid-induced hyperglycaemia ($p < 0.05$). Conclusion: Steroid-induced hyperglycaemia is highly prevalent and is not being monitored or managed adequately. Recognition of the scope of the problem suggests that more needs to be done in terms of education and developing protocols for glucose management in patients receiving high dose steroids.

P85. Efficacy and safety of basal insulin plus glucagon-like peptide-1 receptor agonist versus basal-bolus insulin in type 2 diabetes: A systematic review and meta-analysis of randomised controlled trials

Y. Acharya[1], N. Tangney[2], JL Lim[3], T. O'Brien[1,3], A. Liew[1,3,4]

[1]Department of Medicine, Galway University Hospital, Galway [2]Department of Medicine, Mercy University Hospital, Cork [3]Discipline of Medicine, National University of Ireland Galway (NUIG), Galway [4]Department of Medicine, Portiuncula University Hospital, Galway

Abstract: Basal insulin plus glucagon-like peptide-1 receptor agonists (GLP-1RA) or basal insulin plus pre-prandial bolus (basal-bolus) insulin are two distinct therapeutic approaches for the treatment of type 2 diabetes, with different efficacy and safety profiles. This systematic review and meta-analysis (CRD42020118417) was performed according to the PRISMA guidelines to compare their efficacy and safety profiles. Relevant studies were searched using PubMed and www.clinicaltrials.gov database from their inceptions until 21st August 2020. Randomised control trials (RCTs) comparing basal insulin plus GLP-1RA versus basal-bolus insulin in type 2 diabetes with pre-specified outcomes at 24-30 weeks were included. To reduce heterogeneity, only RCTs utilising the same type of basal insulin for both treatment groups were eligible. The random-effects model was used, and estimates were expressed as the odds ratio (OR) or weighted mean difference (MD), with the corresponding 95% confidence interval (CI). Seven RCTs (3320 participants) met the inclusion criteria. Compared with basal-bolus insulin, basal insulin plus GLP-1RA is associated with a statistically significant reduction in fasting blood glucose (MD: - 0.35 mmol/l; 95%CI: - 0.64,- 0.06; $p = 0.02$), weight (MD: - 3.59 kg; 95%CI: - 4.72, - 2.46; $p < 0.00001$) and less severe hypoglycaemia (OR: 0.40, 95%CI: 0.19, 0.83; $p = 0.01$), but, more nausea (OR: 11.92; 95%CI: 5.01, 28.34; $p < 0.00001$), vomiting (OR: 5.19; 95%CI: 2.84, 9.49; $p < 0.00001$), diarrhoea (OR: 2.58; 95%CI: 1.81, 3.69; $p < 0.00001$), and discontinuation due to adverse events (OR: 3.59; 95%CI: 1.45, 8.92; $p = 0.006$), despite, similar HbA1c changes ($p = 0.20$) and attainment of HbA1c < 7% ($p = 0.31$). Both therapeutic approaches have distinct advantages and disadvantages.

P86. Efficacy and safety of glucagon-like peptide-1 receptor agonist (GLP-1RA) plus basal insulin versus GLP-1RA in Type 2 Diabetes Mellitus: A systematic review and meta-analysis of randomized control trials

MM Satti[1,2], AR Ahmed[3], T O'Brien[1], A Liew[1,4]

[1]Discipline of Medicine, National University of Ireland Galway (NUIG), Ireland, [2]Department of Medicine, Connolly Hospital Blanchardstown, Dublin, Ireland [3]Department of Medicine, Beaumont Hospital Dublin, Ireland [4]Department of Medicine, Portiuncula University Hospital, Galway, Ireland

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P87. Using the *PPARG* functional classifier programme MITER to assess the efficacy of *in-silico* predictions tools in the clinical prediction of Familial Partial Lipodystrophy Type 3 (FPLD3)

[1]M. Mac Aogáin, [2]D. Cotter, [1]S. Savage, [1]E. Walsh, [1]V.E.F. Crowley

[1]Biochemical Genetics, Biochemistry, St James's Hospital, Dublin 8 [2]Genuity Science, Cherrywood Business Park, Loughlinstown, Co Dublin

Background: Next Generation Sequencing (NGS) has greatly enhanced the capacity to search for deleterious genetic variants associated with genetic disorders. A limitation to this approach is the lack of extensive functional characterisation of suspected pathological variants. To overcome this issue *in-silico* prediction tools, including meta-predictors e.g. REVEL, have been applied with limited success. More recently, novel *in vitro* approaches have facilitated the functional assessment of multiple potential protein variants coded by specific genes, including in *PPARG,* where genetic variants are associated with autosomal dominant Familial Partial Lipodystrophy Type 3 (FPLD3). Therefore this technology provides an opportunity to assess the efficacy of *in-silico* variant predictors in a gene-specific manner. Methods: Logistic Regression and Random Forest Machine Learning analysis were applied to determine the performance of REVEL (and other *in-silico* tools) relative to MITER a classifier programme derived from a pooled functional assay for *PPARG* variants. Results: A linear relationship with negative correlation was confirmed between REVEL and MITER ($R^2 = 0.38$). The REVEL threshold score of 0.5 provided excellent sensitivity but poor specificity resulting in a PPV of 65% for *PPARG.* Adjusting the REVEL threshold alters sensitivity and specificity of the *PPARG* datasets suggesting a more optimal threshold between 0.7-0.8. Conclusion: For *PPARG* the adjustment of REVEL thresholds may improve predictive performance relative to MITER, however, there is still a likelihood of misclassification of benign variants even at threshold levels of 0.9. This indicates that a consensus of multiple *in-silico* tools may be required to determine the pathogenicity of unknown genetic variants.

P88. Statistical techniques used in analysing simultaneous continuous glucose monitoring and ambulatory electrocardiogram data in people with diabetes: A systematic review.

B. Charamba[1,2], A. Liew[3], D.T O'Keeffe[4], T. O'Brien[4,5], W. Wyns[6], A. Shahzad[6], A. Nadeem[6], A. Simpkin[1,2]

[1]School of Mathematics, Statistics and Applied Mathematics, National University of Ireland Galway, [2]Galway Insight Centre for Data Analytics, National University of Ireland Galway, Galway [3]Portiuncula University Hospital, Saolta University Healthcare Group, Endocrinology Division, Galway, [4]Centre for Diabetes, Endocrinology and Metabolism, University Hospital Galway, Galway Ireland [5]Regenerative Medicine Institute, National University of Ireland Galway, Galway [6]Smart Sensors Lab, School of Medicine, National University of Ireland Galway, Galway

Abstract: Studies on the complex relationship between glucose and heart rhythm dynamics using simultaneous continuous glucose monitors (CGM) and continuous electrocardiogram (ECG) provide large and useful datasets and have become increasing more prevalent. However, the statistical methods needed for these data are more complex than static data. In this systematic review, we aim to examine the adequacy and appropriateness of the statistical analyses performed in such studies. The PubMed and Web of Science databases were searched for studies utilising CGM and continuous ECG simultaneously. We extracted information of study objectives, technologies used to collect data and statistical methods used in analysis. A total of 18 studies met the inclusion criteria. Six studies were focused on Type 1 Diabetes Mellitus (DM), ten on Type 2 DM and two included both types of DM. Study sample sizes ranged from 11 to 102 participants, with duration of monitoring from 20 hours to 10 days. The most common objective was to study the effect of hypoglycaemia on heart dynamics (10/18). The most common CGM devices used in the studies were the iPro2 (Medtronic) (7/18), Dexcom G4 (3/18) and the MMT-7002 (3/18) sensor. Only four studies used methods that take into account the repeated nature of the data. Most studies underutilised statistical methods suitable for dynamic continuous data, potentially attenuating their statistical power and overall conclusion. We recommend that aggregated data be used only as exploratory analysis, while primary analysis should use methods applied to the raw data such as mixed models or functional data analysis.

P89. Frequency Of Opportunistic Monitoring Of Diabetic Control In Patients With Diabetes Mellitus Admitted Acutely In A University Teaching Hospital

A Prem Kumar[1], *E Ali* [1], *M Widdowson*[1]

[1]Department of Endocrinology and Diabetes, Tallaght University Hospital, Dublin

The minimum recommended frequency of monitoring of glycated haemoglobin (HbA1c) in patients with diabetes mellitus (DM) is 2 measurements/year. However, the interval between routine clinic appointments extends beyond 12 months. Restrictions due to Covid-19, have placed further pressures on outpatient waiting times. The Diabetes Cycle of Care programme supports diabetes care in the community for those with Type 2 DM, but is not consistently available. Aim: To evaluate frequency of monitoring of glycemic control and other biochemical parameters in DM patients admitted to hospital, and if they were performed during admission. Methods: Adult inpatients with known DM as identified via the Diamond database were included. Data on investigations performed was obtained from the electronic laboratory database. Results: 97 inpatient admissions of patients with known DM were included. 19/97 (19.5%) had a HbA1c check during admission. 42.2% (41/97) had a HbA1c measurement within 6 months of admission. 39/97 (40.2%) had a HbA1c measurement in the past year. There was no association between length of stay and measurement of HbA1c (p= 0.20). 48.5%, 38.8% and 46.6% had not had a lipid profile, thyroid profile or B12 level in the past year, respectively. Conclusion: Monitoring of HbA1c and other biochemical parameters associated with diabetes management is poorly adhered to in DM patients in the outpatient and community setting. Opportunistic measurement during inpatient admissions is carried out in a minority of patients but may provide a means of improved monitoring and attention to management of diabetes.

P90. Type 2 diabetes and heart failure: Are we in this together?

D Nagodra[1], *KE Mousa*[1], *VN Obi*[1], *S Kodandapani*[1], *S Fleming*[2], *J Sharma*[1], *MP Kyithar*[1]

[1]Diabetes & Endocrinology Department, Midland Regional Hospital Portlaoise, Ireland [2] Cardiology Department, Midland Regional Hospital Portlaoise, Ireland

Patients with type 2 diabetes mellitus (T2DM) have increased risk of cardiovascular complications, including heart failure (HF). National Diabetes Audit England and Wales has found an association between consistent healthcare attendance and better outcomes in patients with diabetes and HF.

We studied T2DM patients who attended diabetes outpatient service in Midland Regional Hospital Portlaoise in 2018, to determine the proportion of T2DM patients with HF and their clinical characteristics. We randomly selected 150 T2DM patients attending outpatient diabetes service. We found that 15 out of 150 T2DM patients (10%) had the diagnosis of HF. In T2DM patients with HF, their mean age was 68years (range 46-86years) ; 73% were male; 60% had duration of diabetes > 10 years;73% had suboptimal glycaemic control (HbA1c > 53 mmol/mol); 80% had hypertension; 47% had ischaemic heart disease; 67% had diabetic nephropathy; 13% had retinopathy, neuropathy or peripheral vascular disease; none had stroke; 47% had diastolic dysfunction; 40% had reduced ejection fraction; 33% had atrial fibrillation; 6% had valvular abnormality; 53% had hospital admissions for HF in the past two years; 20% required multiple hospital admissions. 88% of admissions occurred in patients at older age (≥ 68years). Our study identified that 10% of our unselected T2DM cohort had the diagnosis of HF. Majority of T2DM patients with HF had significant comorbidities such as hypertension, ischaemic heart disease, diabetic nephropathy, long duration of diabetes and hospital admissions at older age. Therefore, our study highlights the complex nature of T2DM patients with HF and the need to tailor their management.

P91. Description of lipid profile in patients presenting with acute ischaemic stroke

IA Ioana[1], *M Mulroy*[1]

[1]Stroke Department and Geriatric Medicine, Our Lady of Lourdes Drogheda

Patents with ischaemic stroke are classified as very high-risk of future cardio-vascular events. Response to LDL-lowering therapies should be assessed 4-12 weeks after statin initiation/optimisation and repeat every 3-12 months. Recent "Treat to Stroke Target" recommendations suggest even lower LDL (< 1.8 mmol/L) target. An HDL-level below 1 mmol/L is also associated with higher cardiovascular risk. The primary aim was to determine if we achieved these recommendations. Patient data was retrospectively collected (Dec 2019-February 2020), of 263 consecutive patient lipid profiles. 37/263 (14%) were excluded due to primary diagnosis other than ischaemic stroke. 226/263 (85.9%) lipid-profile were analysed which included 89 (39.3%) female and 137 (60.6%) male, average age of 72+/-12.9 yo. Only 50 (22.1%) patients had post stroke follow-up lipid-profile: 19 females, 31 males, average age 67 yo. Average follow up was 143.84 +/-89.6 days. Despite significant reduction in LDL from 2.52 mmol/l to 1.92 mmol/l ($p < 0.01$) achieved, the mean-LDL remained above desired target. We did not find a statistically significant HDL increase ($p = 0.07$) but HDL-mean was above 1 mmol/L. The average Hba1c at the time of stroke was 43.7 +/- 12.84 mmol/mol therefore impaired glucose tolerance. 53/226 (23.4%) had lipids performed several times during same admission, we analysed their CHO-trends. There was a significant reduction on the CHO-trend during inpatient stay for all types except for TG. This might reflect reduction in the inflammatory state or recent statin optimisation. Although acute decrease in total-cholesterol is well documented in myocardial infarction, there is no consensus in stroke. Optimisation of follow-up and lipid management in post stoke patients is recommended.

Miscellaneous

P92. The Investigation and Correction of Hyponatraemia in Acute Medical Admissions

EM Lonergan[1], MT Crowley[1], MJ Hannon[1]

[1]Department of Endocrinology., Bantry General Hospital, Bantry

Hyponatraemia is the most common electrolyte imbalance found in acute medical inpatients. In order to determine its aetiology, it is important to measure the serum osmolality (SOsm), urinary osmolality (UOsm) and urinary sodium (UNa). Patients admitted with hyponatraemia [plasma sodium (PNa) < 130 mmol/L] over a one-month period were retrospectively reviewed to determine which patients had appropriate investigations. Thirty patients presented with PNa < 130 mmol/L; median age 81 (range 45-96); 14 female. 9/30 (30%) had full work-up, 1/30 (33%) had SOsm checked only, 7/30 (23%) had UOsm and UNa checked only, 13/30 (43%) had no workup performed. Four patients died during admission. Of the remaining 26, 20/26 (77%) had PNa ≥ 130 mmol/L on discharge. 6/26 (23%) of these had full workup, 9/26 (35%) had no workup. Of the six patients who were discharged with PNa < 130 mmol/L, 1/6 (17%) was previously investigated, three (50%) had full work-up, 1/6 (17%) had no workup. Of twenty-six patients who were discharged, 16/26 (62%) had documentation of hyponatraemia on the discharge letter: all nine patients who had full workup had a diagnosis of hyponatraemia documented on the discharge letter. In contrast, only 7/17 (47%) who did not have full workup had a diagnosis of hyponatraemia documented on the discharge letter. The performance of appropriate serum and urinary investigations is paramount in correctly ascertaining the aetiology of hyponatraemia, which in turn determines the management strategy. These tests are often sporadically and incompletely ordered. Patients with the correct investigations performed are significantly more likely to have hyponatraemia mentioned on the discharge letter to primary care physicians.

P93. Investigation of hyponatraemia in a hospital setting

LH Hanly[1], DS Slattery[1], FD Donohue[1]

[1]Department of Endocrinology, St Michaels Hospital Dun Laoghaire, Co. Dublin

Hyponatraemia is associated with increased mortality, morbidity and prolonged hospital stay. The investigation and management of hyponatraemia can vary considerably amongst institutions despite clear guidelines available to aid management. We carried out a retrospective audit of our current diagnostic approach to hyponatraemia in St. Michael's Hospital (SMH) and compared it to the guidelines outlined by European endocrine society (ECE). Data of patients with moderate to severe hyponatraemia (Sodium less than one hundred and thirty mmol/l) admitted to hospital over seven months (November 2019 to May 2020) were collected. Forty-three patients were identified. Of these, fluid status was documented as being assessed in only forty four per cent of cases. Of the investigations performed, serum osmolality was checked in fifty-six per cent of patients, urinary osmolality in sixty per cent, urinary sodium in sixty-three per cent, cortisol in twenty-six per cent and thyroid function tests in fifty-three per cent. Fifty-one percent of patients had a cause of hyponatraemia identified. An endocrinology referral was sent in eleven per cent of patients. Of note, discharge was delayed in forty per cent of patients, ranging from four to fifteen days. Only thirty per cent of patients were discharged from hospital with a sodium level in the normal range. Three deaths occurred. Conclusion: Our data shows that adherence to ECE guidelines, particularly into the investigation of hyponatremia in SMH is lacking. A diagnostic algorithm is needed to help ensure a more consistent approach to this, in line with current guidelines to improve patient outcomes.

P94. No effect of calcium and vitamin D intake on maternal blood pressure in a healthy population.

H Forde[1], R Crowley[1,2], M McKenna[1,2], M Kilbane[3], M Conway[2], C McDonnell[4], P Twomey[3], F M McAuliffe[1,2]

[1]Department of Endocrinology, St Vincent's University Hospital, Dublin, Ireland.[2]UCD Perinatal Research Centre, School of Medicine, University College Dublin, National Maternity Hospital, Dublin, Ireland.[3]Department of Clinical Chemistry, St Vincent's University Hospital, Dublin, Ireland.[4]Department of Paediatric Endocrinology & Diabetes, Children's Health Ireland, Temple Street Hospital, Dublin, Ireland.

Clinical studies have reported an inverse relationship between calcium and vitamin D intake and the development of pre-eclampsia and hypertensive disorders of pregnancy (HDP). However, routine calcium and vitamin D supplementation in pregnancy is not yet recommended. The aim of this study was to investigate whether calcium and vitamin D intake during pregnancy, and at 5 years follow up, is associated with maternal blood pressure in an otherwise healthy population. We conducted observational study of 415 women who participated in the ROLO (Randomised cOntrolled trial of LOw glycaemic index diet for the prevention of recurrence of macrosomia) study, in the National Maternity Hospital, Dublin, Ireland, from 2007 to 2011. Maternal BP measurements were taken during each trimester and at 5-years follow-up. Calcium and vitamin D intake was determined at each trimester and serum vitamin D (25OHD) levels were measured in early and late pregnancy. The percentage of women with adequate calcium intake was 71.0, 69.3 and 73.1% in trimester 1-3 respectively. There was no correlation between calcium or vitamin D intake and maternal BP (systolic, diastolic or mean arterial pressure (MAP)) in trimester 1-3 or at 5 years follow up. Early 25OHD negatively correlated with MAP in trimester 1 ($p = 0.044$). There was no correlation however between late 25OHD and BP at 34 weeks' gestation or 25OHD and BP at 5 years follow up. In conclusion, in a healthy population of women with adequate calcium and vitamin D intake, no clinically significant correlation exists between calcium and vitamin D and maternal BP.

P95. Vitamin D deficiency and timely replacement.

B Rizvi[1], N Awan[1], M Rahaman[1]

[1]Department of Medicine, Department of Endocrinology, St.Columcille Hospital, Loughlinstown

Vitamin D is essential for musculoskeletal growth, bone health and prevention of infections. Our general population over sixty five of

age and elderly, lack of sunlight, in door sittings, renal or hepatic failure, being on anticonvulsants or glucocorticoids is at risk of developing deficiency. A retrospective audit carried out on patients having Vit D tested between July and August 2019 using national osteoporosis guidelines as audit too, a brief summary is as follows

	Total no.	Vitamin D level<25	Vitamin D>25 <50
Patients with vitamin D levels either deficient or inadequate	47	17/47 (36%)	30/47 (64%)
Patients taking vitamin D supplements prior to testing	03/47 (6%)	01/03 (2%)	02/03 (4%)
New vitamin D prescriptions	19/47 (41%)	10/47 (22%)	09/47 (19%)
Vitamin D not prescribed	25/47 (53%)	07/25 (15%)	18/25 (38%)

The results highlighted vitamin D being checked in number of patients but results were not followed adequately in significant percentage of patients, the guidelines are available and they need to be followed. We have aimed to present the results in our hospital academic meeting, aiming NCHD education and emphasis on appropriate vitamin-D testing and adequate follow up on results.

P96. Real world cut off points for the aldosterone and renin ratio: experience at St James's Hospital Biochemistry Laboratory

T Cronin[1], E Rasheed[1], C Collison[1], V Crowley[1]

[1]Department of Biochemistry, St James's Hospital, Dublin

The aldosterone: renin ratio (ARR) is useful in the investigation of secondary causes of hypertension. An elevated ratio is associated with primary aldosteronism and may warrant further more invasive investigations including a saline infusion test. However, differing ARR cut offs are utilised and sex specific levels are also proposed. To establish a more targeted investigative approach sex specific ARR cut-offs were determined using existing laboratory data and compared with ARR thresholds in published guidelines or derived from reference populations. Plasma aldosterone and direct renin results from ambulant subjects attending St James's Hospital (SJH) outpatient clinics and primary care, and covering a 2.5 year period were collated from the LIS . An outlier elimination method, Tukey's Fences, was used to determine a potential ARR cut off. A total of 379 paired aldosterone and renin samples were identified. For 115 samples, either the aldosterone or renin analysis produced a non-numerical value, which prevented ARR calculation and therefore these were excluded from the statistical analysis. In the remaining 264 samples, the calculated ARR cut off for the total sample was [46.8 (pmol/L) (mIU/L)], with sex-related levels for females [51.3(pmol/L) (mIU/L)] ($n = 146$) and males [36.3 (pmol/L) (mIU/L)] ($n = 118$). While SJH calculated ARR cut-offs differ substantially from the Endocrine Society guidelines [> 91 (pmol/L) (mIU/L)], the data is more compatible with a general clinical decision limit of [> 35 (pmol/L) (mIU/L)] generated using a reference population.

P97. Survey on the perception of diabetes and endocrinology as a career among medical students and non-consultant hospital doctors in Galway University Hospital

C. De Buitléir[1,2], C. Yassa[1], C. Malone[1,3], T. O'Brien[1,2], A. Liew[1-3].

[1]Discipline of Medicine, National University of Ireland, Galway (NUIG), Galway [2]Department of Diabetes and Endocrinology, Galway University Hospital, Galway [3]Department of Surgery, Galway University Hospital, Galway [4]Department of Diabetes and Endocrinology, Portiuncula University Hospital, Galway

A survey on the perception of diabetes and endocrinology (D&E) as a career was conducted among medical students from National University Ireland Galway and non-consultant hospital doctors in Galway University Hospital, following ethical approval. We sought to compare it with the recent survey by Puttanna and colleagues which revealed a worrying lack of interest in D&E as a career in the UK. 41 doctors and 164 medical students completed the survey. 87% doctors and 35% medical students had previous placement in D&E. For doctors, the commonest reasons why D&E was least likely a career choice were 'being a medical registrar' (34%), 'looking after majority of general medical admissions' (31%) and D&E being a 'non-procedural specialty' (29%), while for medical students were 'uncertainty of speciality future in secondary care' (37%), D&E being a non-procedural speciality' (34%), and 'limited job opportunities' (28%). Despite that, 29% doctors and 20% medical students in this cohort stated their likelihood of pursuing D&E as a career, in contrary to the UK survey. Both group stated that D&E is 'an interesting and rewarding specialty'. They also stated that 'inspired by people in the field' were commonest reasons why they were most likely to pursue D&E as a career. This highlights the importance of role models within the D&E department in cultivating interest in their future career choice. Reference: Puttanna A, et al. Changing perceptions: a multicentre survey of final-year medical students' and junior doctors' perceptions of diabetes and endocrinology. *Postgrad Med J 2020; 96: 589-593.*

P98. Referrals to the National Centre of Neuroendocrine Tumours Multidisciplinary Team Meetings

H Almeamar [1],L Cullen [1],S Skehan [2,3], N Swan [4,3], R Crowley [1,3], D O'Toole [1,5], D O'Shea [1,3]

[1]National Centre for Neuroendocrine Tumours, St. Vincent's University Hospital, Elm Park, Dublin 4. [2] Department of Radiology, St. Vincent's University Hospital, Elm Park, Dublin 4. [3] UCD School of Medicine, Belfield, Dublin. [4] Department of Pathology, St. Vincent's University Hospital, Elm Park, Dublin 4. [5] Department of Clinical Medicine, St James's Hospital, Dublin 8.

Neuroendocrine tumours (NETs) are rare, but their incidence is increasing. It is recommended by the Irish National Cancer Strategy and the European Neuroendocrine Tumour Society (ENETS) guidelines that all NET cases should be discussed at multidisciplinary team meetings (MDTs). NET cases are discussed fortnightly at the National NET Centre, ENETS Centre of Excellence MDTs. We reviewed all new referrals to the MDT from May 2019 to November 2019. 63 patients were referred for discussion. Majority of the cases were within the 50-79 years-old age group. 46% of the referrals were from County Dublin. 52% were females. 40% were referred by surgeons. Gastroenterology, oncology, and endocrinology were the other main referring specialities. Ileum was the primary site of tumour in 21% of the cases, pancreas in 17%, lung in 11%, stomach in 10%, and rectum in 8%. Majority of the tumours were well differentiated, of those 89% of cases were grade one and two. Neuroendocrine carcinoma was found in 11% of cases. The NETs were new diagnosis in 69% of cases, the rest had been treated in other hospitals. Radiology discs uploads and histology slides submissions required by our MDT for most cases, and they arrived within ten days to the MDT date in

majority of cases. Once the referral received, the cases were discussed within our target time of four weeks. There was a gap from the referral letter typing date to receiving date in majority of cases. We will encourage email referrals in the future to address this gap.

P99. Challenges faced in capturing data for European Reference networks applications 2019

S.J. O'Riordan[1], C McCarthy[1], B O'Sullivan[1], RK Crowley[1]

[1]Dept of Endocrinology, St Vincent's University Hospital, Dublin 4

SVUH is the lead site for European Reference Network applications for rare bone disease, rare lung disease and NET component of rare cancer; and contributes to rare endocrine disease.

We audited all the sources by which participants generated data for the ERN submission; this was an assessment of coding in the ICT infrastructure of SVUH. A total of seven different data resource types generated ERN data. EURACAN data were obtained from the service report, appointments system, lab system and theatre lists. BOND data were acquired from bone clinic lists. ENDO data were compiled from pathology reports, genetics file, MDT lists, clinical letters and lists. Lung data came from the cystic fibrosis database, and clinic lists. The only coding system available in SVUH was SNOMED used by pathology. No other coding e.g. Orpha-code or ICD was available for any other sub sections. Individuals had to search through clinic and MDT lists, patient letters, lab systems and in some cases databases based on patient information. The introduction of a coding system into SVUH based on ICD or orphacodes would enable information to be accessed; supporting the appointment of database managers for rare disease.

Moreover, there is further consonance with sex-specific thresholds derived from studies of healthy volunteers i.e. [> 64 (pmol/L) (mIU/L)] and [> 25 (pmol/L) (mIU/L)] for females and males respectively.

P100. Primary Hyperparathyroidism – The Role of MIBI combined with SPECT CT

C Flannery[1], M Binhussein[2], F Bukhari[2], B Alharthi[2], A Algethami[3], A Khojah[4],JP O'Neill,[5] M Sherlock[2], CJ Thompson[2], D Smith[2], A Hill[5], A Mc Erlean[6], A Agha[2]

Department of Chemical Pathology, Beaumont Hospital, Dublin 9 [1] Department of Endocrinology, Beaumont Hospital, Dublin 9,[2] Department of Endocrinology, Connolly Hospital, Blanchardstown, Dublin 15 [3], Department of Paediatric Immunology and Rheumatology, Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, Illinois [4], Department of Surgery, Beaumont Hospital, Dublin 9[5], Department of Radiology, Beaumont Hospital, Dublin 9[6]

Localisation studies using technetium-labelled sestamibi scintigraphy (MIBI) facilitates selective parathyroidectomy in patients with primary hyperparathyroidism (PHPT). However, the reported sensitivity of this technique varies considerably between studies. We previously reported a sensitivity of 56%[1]. We carried out a retrospective study to assess the sensitivity of MIBI when combined with single-photon emission computed tomography/computed tomography (SPECT/CT) in 205 patients with a biochemical diagnosis of PHPT with a median adjusted calcium 2.74 mmol/L and a median parathyroid hormone of 114 pg/mL. 57 patients had parathyroid surgery. The sensitivity of sestamibi SPECT/CT was 62%, using surgical adenoma location with histological confirmation as the gold standard. Parathyroid hormone, adjusted calcium, phosphate and adenoma weight had a significant impact on the sensitivity of MIBI-SPECT/CT. The concordance (precise adenoma location) between MIBI-SPECT/CT and parathyroid ultrasonography was 53%, while the triple concordance rate, between MIBI-SPECT/CT, ultrasonography and surgical findings, was 50%. In patients with underwent surgery, a 91% biochemical cure rate was observed. MIBI-SPECT/CT had a modest sensitivity of 62% in localising parathyroid adenomas in this study, which probably reflects the relatively mild nature of the disease in the patients studied. Adding SPECT/CT has led to a 6% increase in the sensitivity.

Reference:1 Glynn N, Lynn N, Donagh C, Crowley RK, Smith D, Thompson CJ, Hill ADK, Keeling F, Agha A. The utility of 99mTc-sestamibi scintigraphy in the localisation of parathyroid adenomas in primary hyperparathyroidism. *Ir J Med Sci* 2011; 180: 191-194

ABSTRACTS: STUDENT PRESENTATIONS

P101. The Clinical Significance and Burden of Thyroid Nodules Discovered Incidentally

R Dureja[1], C Casey[2], J Barry[3], A Tuthill [2]

[1]University College Cork, School of Medicine [2]Department of Endocrinology and Diabetes, Cork University Hospital [3]Department of Radiology, Cork University Hospital.

Reporting of thyroid incidentalomas (TI) on imaging performed for other indications has led to a clinical dilemma. The majority of thyroid nodules are benign, however guidelines suggest that a TI should be evaluated to rule out malignancy. This study aimed to determine the incidence of TIs and the likelihood that they reveal a sinister pathology in the largest Irish cohort studied to date. A retrospective chart review was conducted using imaging studies performed in Cork University Hospital from July 2018-December 2018. 1,000 imaging studies were screened for the presence of TIs. Electronic records and medical charts were used to track the follow-up and final outcome of the identified nodules. Out of 1,000 scans, 14 (1.4%) thyroid incidentalomas were discovered. The occurrence of TIs by imaging was 2/500 (0.4%) for carotid doppler and 12/500 (2.4%) for CT thorax. Three (21.4%) TIs were evaluated with a subsequent ultrasound. All three of the TIs were found to be ≥ 1.0 cm and underwent fine needle aspiration. Using cytology, these nodules were given a Thy 2 grading (non-neoplastic). In conclusion, this study found no clinical benefit to reporting the presence of TIs discovered incidentally. The three TIs which were evaluated were found to be benign, suggesting that TIs are unlikely to have a sinister pathology. The concern remains that ~98 TIs are expected to be found on CT and US in a year; this number may be enough to cause strain on the healthcare system and unnecessarily burden patients with further investigations.

P102. Clinical phenotype and management of Hepatic Nuclear factor 1 beta (HNF1 beta) diabetes.

J Kim[1], N Ng[1], M Zamuner[1], N Siddique[1], M Byrne[1]

[1]Department of Endocrinology, Mater Misericordiae University Hospital, Dublin 7, Ireland

Mutations in the HNF1-beta gene can result in pancreatic agenesis leading to insufficient insulin secretion and a diagnosis of diabetes. Other studies have shown the co-existence of insulin resistance in subjects with HNF1-beta diabetes. Previous studies have shown that over 70% of subjects require insulin therapy, with only 3/10 successfully switched from insulin to sulphonylurea (SU) therapy. The aim of this study is to describe the phenotypic features of HNF1-β subjects, their insulin secretory response to oral glucose and response to SU therapy. 12 participants with HNF1-beta gene mutations were phenotyped. Glucose and C-peptide

response at 30 min intervals to a 75 g glucose tolerance test was performed. Transfer from insulin to SU was attempted in 5 subjects. 10/12 subjects were diagnosed with diabetes. Mean age and HbA1c at diabetes diagnosis was 30.2 ± 15.5 years, and 60.9 ± 17.1 mmol/mol. 6/10 were on insulin therapy. 4/12 subjects had pancreatic agenesis and 3 of those had reduced faecal elastase. 5/12 subjects had a reduced insulin secretory response on OGTT (fasting C-peptide < 0.2 nmol/L and 2 hr < 0.6 nmol/L). 9/12 showed insulin resistance on HOMA-IR. At follow up only 1/6 was maintained on SU alone (Hba1c of 55 mmol/mol) with the others requiring insulin plus SU (HbA1c 67.5 ± 6.1 mmol/mol). 3/10 were on SU at genetic diagnosis (HbA1c of 83.0 ± 6.6 mmol/mol) but progressed to insulin therapy (HbA1c 63.7 ± 4.9 mmol/mol). 1/10 was controlled with metformin alone. The majority of subjects with HNF1-beta diabetes require insulin therapy (80%). Only 2 subjects remain well controlled on oral agents.

P103. Promoting appropriate discharge of patients with uncomplicated type 2 diabetes from secondary to primary care

J Logue[1], *T Kyaw Tun*[1], *JH McDermott*[1], *S Sreenan*[1].

[1]Dept of Diabetes and Endocrinology, Royal College of Surgeons in Ireland University of Medicine and Health Sciences, Connolly Hospital, Blanchardstown, Dublin 15

The 'Cycle of Care' (CoC) for Diabetes Mellitus (DM) was launched in 2015 to facilitate the transfer of care of 'uncomplicated' patients with Type 2 DM (T2DM) from secondary to primary care but clinics often do not discharge appropriate patients. The purpose of this project was to facilitate appropriate transfer of patients with uncomplicated, well- controlled T2DM from secondary care primary care in line with Model of Integrated Care for T2DM (MoIC) recommendations. To achieve this we audited our diabetes review clinic for one month (January 2019) to determine what proportion of patients met criteria for primary care management. Then all General Practitioners (GPs) who refer to the service were contacted to ask if they had signed up to the CoC. Patient charts were then reviewed prior to clinics (August 2019) and a prompt sheet was attached to the charts of those who met the criteria to trigger considering discharge. The number discharged and reasons for not discharging patients were recorded. At baseline, we found that 38.6% of patients met the MoIC clinical criteria for management in primary care but only 6.8% were discharged. Following intervention the proportion discharged increased to 23.7%. The most common reasons for not discharging appropriate patients were that they did not have a medical card and/or their GP was not participating in the CoC. We conclude that a significant number of people with T2DM meet the criteria for discharge from secondary to primary care and a simple intervention can promote the decision to discharge.