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OBSTETRIC FACTORS INFLUENCING THE OUTCOME OF VERY LOW BIRTHWEIGHT INFANTS

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The outcome of very low birth weight (VLBW) infants < 1500 g including those weighing < 1000 g has greatly improved in the last decade. As Caesarean section becomes a safer and more acceptable method of childbirth, it is increasingly performed at earlier stages of gestation. Evidence that Caesarean delivery is effective in reducing intrapartum complications is hard to obtain. We have therefore reviewed our experience in the survival of VLBW infants over a 3 year period.

161 infants weighing less than 1500 g were delivered at the obstetric unit and cared for at the Regional Neonatal Intensive Care Unit in Leeds between January 1983 and December 1985. The hospital survival rate was 63% in 49 infants who weighed 1001-1500 g and 84% in 112 who weighed 1001-1500 g. The survival rate after Caesarean birth was higher than that after vaginal delivery in the 1001-1500 g group. It is too early to say whether there is a significant difference in the outcome between Caesarean and vaginal births as this requires follow up of these infants at 1 year, 2 years and 5 years.

ILLUMINATION OF INFANTS IN A NEONATAL INTENSIVE CARE UNIT AND A NEWBORN NURSERY

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Since Cremer *et al* described the influence of light on neonatal jaundice, illumination has been recognised as an important aspect of the infant's environment. Further concern about illumination arises from the suggestion by Glass *et al*, 1985 that neonates exposed to bright light are at increased risk of retinopathy of prematurity. Using a Robin Electronics Illuminometer, I measured the variation in illumination of infants in our hospitals, and further investigated ways of controlling the exposure of infants to light.

Illumination of different infants at the one time ranged from 50 - 4,500 lux, some of these infants receiving illumination equivalent to that of phototherapy (2,000 - 5,000 lux). This distribution of illumination across infant stations was maintained over a 24 hour period. A significant difference ($P < 0.005$) existed between illumination on a sunny day and on a dull day, in the south facing stations.

An awareness of these three determinants of infant illumination (infant location, time of day, ambient weather), combined with manoeuvres such as opening/closing blinds, turning lights on/off and facing infants in high illumination stations away from windows, allowed us to exert considerable control over infant illumination.

PRIMIPARA 40 YEARS AND OLDER: OUTCOME OF 100 CONSECUTIVE CASES

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There is an increasing incidence of elderly primiparae due to a changing career structure. The present study is the largest of its kind in modern times. The aim of the study is to demonstrate that there are grounds for optimism for those mothers becoming pregnant at this comparatively advanced age.

One hundred consecutive pregnancies in mothers who were 40 years or more were studied. Comparisons were made with 25,834 primiparae less than 40 years delivered during the

same time period (1976-1984). Hypertension was the commonest antenatal complication. The rate of induction of labour was 35%, 6 times higher than in the younger group. There were 3 perinatal deaths. One still birth occurred at 36 weeks gestation in the presence of chronic hypertension. Two neonatal deaths were due to congenital malformations. When corrected for congenital malformation the perinatal mortality rate was less in the older group of mothers. There was one case of cerebral dysfunction following abruptio placentae in labour. There was a high incidence of Down's Syndrome as expected. It is concluded that obstetric intervention for maternal age alone does not influence the outcome of pregnancy. The present optimism for these mothers could be enhanced by lower intervention.

NARCOTIC ABUSE — EXPERIENCE OF A DUBLIN MATERNITY HOSPITAL

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In keeping with the general trend towards drug abuse in our cities, we are seeing increasing numbers of pregnant narcotic addicts. In the Coombe Hospital we conducted a retrospective study of the period 1982-1985 to discover the extent of the problem in our maternity and neonatal service, and to look at the effects on mothers and babies, with a view to improving the care of these patients.

We reviewed the cases of 29 mothers and their 42 babies and found that narcotic addiction presented a wide range of physical and social problems for mother and baby. All mothers were from socially deprived backgrounds, most were smokers and had partners who were drug abusers. They had a poor record of attendance for antenatal care and had frequent admissions to hospital. Many had a past history of hepatitis and some were chronic carriers. In the early neonatal period the main problems encountered by the babies were related to the high incidence of prematurity, low birth weight, and the features of withdrawal syndrome. A high incidence of twins was noted. Screening for A.I.D.S. in more recent cases has presented disturbing results.

It is hoped that greater awareness on the part of all health care personnel and a carefully planned multidisciplinary approach to the mother and baby may improve their general health and well being in the future.

PROBLEMS WITH PANCURONIUM IN THE NEONATAL NURSERY

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Pancuronium bromide (Pavulon), a competitive, non depolarising neuromuscular blocker, has been increasingly used to achieve muscle paralysis in ventilated newborn infants. It is considered to decrease the likelihood of pneumothorax occurring in infants who expire against positive pressures, and to decrease periods of suboptimal oxygenation and increased intracranial pressure. Compared to other similar agents absence of histamine release and freedom from cardiovascular side effects, particularly hypotension have been noted.

In the past 17 months (1.1.'85 - 31.5.'86) 6 preterm infants, in our N.I.C.U. who subsequently died, showed acute deterioration associated with pancuronium administration. Increased peak inflation pressures were required to resolve cyanosis. Three were already on rapid rates. All 6 infants developed severe pulmonary interstitial emphysema as a major complication associated with their demise. The need for increased mean airway pressure and more rapid ventilator rates in babies paralysed with pancuronium have not shown a significant decrease in mortality in ventilated infants. It may be

that theoretical advantages are counterbalanced by adverse effects. It does not appear to be an ideal agent for immature babies. Other sedative/paralysing agents need to be studied further.

NATURAL SURFACTANT THERAPY FOR SEVERE RESPIRATORY DISTRESS SYNDROME (R.D.S.) REDUCES THE INCIDENCE OF INTRAVENTRICULAR HAEMORRHAGE (I.V.H.)

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As part of a collaborative European trial a natural porcine surfactant was used to treat babies with R.D.S. in Belfast. The study is randomised and double blind in design and interim analysis has been carried out after enrolment of 25 infants to determine any adverse effects of treatment.

Entry criteria included presence of severe R.D.S. (clinical and radiological), need for mechanical ventilation and oxygen concentration over 60%, age less than 15 hours and weight 700-2000 g. Thirteen babies were treated (intratracheal instillation of 200 mg phospholipid/kg) and 12 acted as controls. Results are shown in Table.

	Treated (N=13)	Control (N=12)	P
Birth weight (g)	1357	1362	NS
Survival	9 (69%)	4 (33%)	NS
Pneumothorax	5 (38%)	10 (83%)	0.05
Intraventricular haemorrhage	3 (23%)	9 (75%)	0.01

Natural surfactant treatment reduces the incidence of I.V.H. in babies with very severe R.D.S. When greater numbers have been enrolled a reduction in time on ventilation and improved survival should also be demonstrated.

SONOGRAPHIC ASSESSMENT OF FETAL HEALTH: GALWAY — THE FIRST 18 MONTHS

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Antenatal assessment of fetal health using diagnostic real-time ultrasound has received increasing attention in recent years. With this diagnostic modality it is now possible to detect a variety of conditions likely to be associated with altered perinatal outcome.

Specifically, fetal structural congenital defects may be accurately identified from the mid trimester onwards. In addition, by measurement of a variety of morphometric indices of the fetus it is possible to identify the abnormally grown (small for gestational age) fetus. Finally, assessment of acute and subacute variables of fetal condition have recently been reported to be of use in identifying the fetus at risk for asphyxial stillbirth. In particular, assessment of amniotic fluid volume by vertical pocket depth measurement and documentation of the fetal biophysical profile score have been reported as accurate methods for identifying the fetus at risk for antenatal asphyxial stillbirth.

In January 1985 a Fetal Assessment Unit using diagnostic real-time ultrasound was established in the Department of Obstetrics and Gynaecology at the Regional Hospital, Galway. Obstetric patients with recognised high-risk antenatal factors were referred to this unit for the specific purpose of antenatal assessment for fetal health. At the time of referral, a detailed sonographic examination comprising assessment of fetal structure, fetal growth, amniotic fluid volume measurement and documentation of the fetal biophysical profile scores was performed. Serial examinations were carried out when indicated. Based upon the sonographic examination intervention with an aim to improve perinatal outcome was recommended if either abnormal fetal growth, oligohydramnios or an abnormal biophysical profile score was documented. During the

first 18 months since its establishment in excess of 1,000 high-risk obstetric patients have been seen and assessed in this unit.

Comparison of the perinatal mortality statistics for the two years prior to the establishment of the ultrasound based Fetal Assessment Unit to the first 18 months following its introduction reveal significant results. Both gross and corrected mortality rates have been noted to fall from 13.1/1,000 and 10.7/1,000 respectively to 8.06/1,000 and 5.22/1,000 respectively. In addition, the etiology of perinatal deaths has undergone major changes. Asphyxia, the single most frequent cause of perinatal mortality prior to the introduction of the fetal assessment unit, has been replaced by fetal congenital anomalies as the single most common cause of perinatal death.

THE DUBLIN COLLABORATIVE STUDY OF TERM ASPHYXIAL SEIZURES

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The study population includes all liveborn term infants in the Coombe, the National and the Rotunda Maternity Hospitals from January 1 1980 to December 31 1984. 101,829 infants were included of whom 89 developed either a generalised or focal seizure within 48 hrs. of birth where asphyxia was deemed to be the cause after detailed assessment (overall asphyxial seizure rate 0.87/1,000 live term births).

The perinatal characteristics of this group, including management and outcome, and a group of matched controls, will be presented. There was a significantly different seizure rate between hospitals and these differences will be discussed in the context of hospital practice and compared to other indices of full term asphyxial damage (e.g. P.M.R. > 2.5kg excluding malformations). It is suggested that crude P.M.R. no longer adequately reflects outcome and that, particularly in term infants, other indices of asphyxial damage should be employed.

FETAL WASTAGE IN MULTIPLE PREGNANCY PATIENTS. (A TWELVE YEAR REVIEW: 1972-1984)

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At the Regional Hospital, Galway, the maternity unit delivers around 3,000 women annually from a catchment area of 100,000 people. During the twelve year period April 1st 1972 to March 31st 1984, there were 458 multiple births over 28 weeks gestation. These were divided into 453 (98.9%) twin, and 5 (1.09%) triplet pregnancies. As no triplet baby died the perinatal mortality refers in effect to twin pregnancies. The perinatal mortality in this context refers to babies born after the end of the 28th week of gestation, who died within 6 weeks of delivery.

A total of 72 babies were lost from 921 multiple pregnancy births, giving a perinatal mortality rate of 78.2/1,000 of which 34 (3.69%) of the total babies delivered were stillbirths, and 38 (4.13) were neo-natal deaths. There were 4 congenital abnormalities, which was 5.56% of the total number lost, and 0.43% of the total number delivered. This gives a low congenital abnormality rate of 39.8% in a ten year study of perinatal mortality (1972-1982) reported previously by this author. The 72 babies lost were delivered by 51 patients and were divided as follows:

45 (88.24%) mothers had vaginal deliveries, 4 (7.84%) had elective and 2 (3.92%) had emergency lower segment Caesarean sections. In babies delivered vaginally, breech deliveries accounted for 52.78% of babies lost, and this fact will be given further elaboration and evaluation.

There were 32 mothers with a gestational age of < 37 weeks, and 19 where gestational age was $\geq$ 37 weeks. When one considers that the incidence of multiple pregnancy has remained constant around 7% per annum, a significant finding showed 55 (76.38%) of these babies were lost between the years 1972 and 1978, proving that with intensive antenatal care, intensive monitoring in labour and better neonatal paediatric services, the perinatal mortality with multiple pregnancy can be improved.

SCREENING FOR INTRA-UTERINE GROWTH RETARDATION — THE THIRTY TWO WEEK SCAN

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This was a prospective study carried out in the Jubilee Maternity Hospital between September 1984 and January 1985 to compare the efficiency at 32 weeks of a clinical method of detecting intrauterine growth retardation (the symphysis fundal height) as compared to a single ultrasonic assessment at this gestation.

Six hundred and forty-five patients were suitable for entry to the trial. The uterine fundal height was recorded in each case and each patient then received an ultrasound examination without prior knowledge of this fundal height measurement.

The above data were then computer-analysed and cross-tabulated with the eventual gestation of birth and birth-weight. Ultrasound estimation revealed a fifty-five per cent sensitivity at 32 weeks with an acceptable false positive rate of six per cent. The single measurement of symphysis fundal height revealed only a forty-nine per cent sensitivity.

It is postulated that a combination of the above screening methods may be an improvement on the detection of intra-uterine growth retardation.

ASSESSMENT OF GROWTH DISCORDANCY IN TWIN PREGNANCIES USING REAL TIME ULTRASOUND

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Birth-weight discordancy is recognised as being associated with altered perinatal outcome in twin pregnancies. Identification of the abnormally grown singleton fetus is a major application of dynamic real-time ultrasound. Using this diagnostic modality, assessment of fetal growth may be performed by serial measurement of the fetal head circumference, abdominal circumference and femur length. Estimation of fetal weight (EFW) may then be derived from one or more of these measurements. In this paper, we report on our experience in identifying the discordantly grown, structurally normal twin pair using dynamic real-time ultrasound.

Forty-four unselected, consecutive twin pregnancies at a risk for growth discordancy were studied over an eighteen month interval ending June 30th 1986. Assessment of fetal growth in structurally normal twin pairs was performed by measurement of the fetal abdominal circumference and estimation of fetal weight from this measurement. Growth discordancy was suspected and assessment for delivery recommended if the estimated fetal weight difference (Δ EFW) between twin pairs was $\geq 25\%$ of the weight of the smaller twin in pregnancies > 30 weeks gestational age. The outcome index used to judge the accuracy of this method of fetal assessment was the correlation between Δ EFW% compared to actual birth weight difference expressed as a percentage of the weight of the smaller twin (Δ BW%).

Six of the forty-four twin pregnancies were excluded from analysis because of either delivery before the end of the 30th week of gestation (3 cases), major structural congenital defects affecting one or more of the twin pairs (2 cases) and intrauterine death documented in one twin at the time of initial assessment (1 case). A Δ BW of $\geq 25\%$ was noted at delivery in four of the thirty-eight (10.5%) remaining cases. Of these three (75%) were accurately identified in the

antenatal period. The sensitivity, specificity and both positive and negative predictive values as well as the correlation between Δ EFW% compared to Δ BW% will be presented.

IS BIRTH ASPHYXIA DUE TO CHRONIC UTERO-PLACENTAL INSUFFICIENCY? THE ROLE OF PLACENTAL MORPHO- METRIC EXAMINATION

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Utero-placental insufficiency due to pre-eclampsia (PET) is characterised by a marked increase in cytotrophoblasts of the placental chorionic villi. In this study, placentae from third trimester intra-partum asphyxial deaths were evaluated and compared with placentae from severe PET (positive controls) and normal non-smokers (negative controls). The evaluation consisted of a single random PAS stained histological section per case counted for cytotrophoblast positive villi. The period of gestation was greater than 36 weeks in all cases. Eighteen cases of intrapartum death contained a mean 22 cytotrophoblast positive chorionic villi with a range of 2-42; twenty negative controls had a mean of 5 with a range of 0-23; sixteen cases of PET had a mean value of 50 with a range of 16-69. Despite the overlap in the ranges for cytotrophoblast positive villi, there is a four fold increase in the mean value of less than half of the PET mean. The abnormal cytotrophoblast population occurring in PET is due to UPI commencing in the second trimester, and the number is probably time dependent. The number of cytotrophoblasts present in cases of intra-partum asphyxial death are significantly less than this, and probably reflects UPI of shorter duration.

CORRELATION OF FETAL OUTCOME WITH MECONIUM STAIN AMNIOTIC FLUID AS ASSESSED BY FIBEROPTIC AMNIOSCOPE WITH COLORIMETRIC ANALYSIS

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Meconium stained amniotic fluid is associated with chronic or acute intrauterine hypoxia and life-threatening meconium aspiration syndrome. Clear amniotic fluid in normal amounts is reassuring. Meconium stained amniotic fluid is a commonly accepted, though unreliable indicator of fetal distress and cannot be disregarded.

Several attempts have been made to correlate fetal outcome with meconium staining of amniotic fluid. Initially a rigid conical amnioscope was used. This was succeeded recently by a fiberoptic scope which was more suitable, particularly for the unfavourable cervix, because of its size and flexible tip. Dornan et al's amnioscope study investigated the presence of meconium-stained amniotic fluid in conservatively managed primigravidae with prolonged pregnancies.

We report the use of fiberoptic amnioscope in 110 cases for a wide range of indications, and attempt to correlate fetal outcome with meconium stained amniotic fluid. Further, we report the development of an adaptation to this fiberoptic amnioscope. In order to remove the observer bias and to quantitate the grade of meconium-staining reproducibility, we have included a small pilot study involving colorimetric analysis of the viewed amniotic fluid.