

## British Society for Paediatric Endocrinology & Diabetes/British Paediatric and Adolescent Bone Group

### G93 THE OUTCOME OF PRENATAL IDENTIFICATION OF A SEX CHROMOSOME ABNORMALITY

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**Introduction** Prenatal diagnosis (PND) via amniocentesis or chorionic villus sampling may result in the identification of a sex chromosome abnormality, often as an incidental finding.

**Aims** To ascertain the incidence of sex chromosome abnormalities detected by prenatal diagnosis in the Grampian and the West of Scotland (WoS) regions and to determine the characteristics and outcomes of these cases.

**Methods** Retrospective review of all cases of prenatal diagnoses that revealed a sex chromosome abnormality between 2000 and 2012.

**Results** Over the period of 12 years, 166 positive cases were identified. The indication for PND was an abnormal ultrasound scan in 95(57%), high-risk first trimester screening results in 31(19%), age related aneuploidy risk in 24(14%), maternal anxiety in 9(5%) and a family history of a chromosomal abnormality in 7(4%). Of the 166 cases, 79(48%) cases were 45, X, 24(14%) were 47, XXY, 14(8%) were 48, XXX, 9(5%) were 45, X/46, XX., 8(5%) had a structurally abnormal X chromosome, 7(4%) were 45X/46XY, 6(4%) were 48, XYY, 2(1%) were 46, XX/46XY and 17(11%) had other variations of sex chromosomes. Of the 166, 73(44%) pregnancies were terminated and of these cases, 47(64%) had a karyotype of 45, X. An additional 7 pregnancies(4%) were associated with an intrauterine death and 5 of these were 45, X. Based on a combined birth rate of 40,000 births per year for these regions, it is estimated that there was one positive case for 3,500 births and approximately half of these led to a live birth.

**Conclusions** 1:7000 births are associated with a prenatally diagnosed sex chromosome abnormality. 45, X is the most commonly encountered abnormality. Given the rare incidence, there is a need to improve our understanding of the care of these cases during the pregnancy as well as afterwards.

### G94 CHARACTERISING CHANGES IN THE IN VIVO RODENT BRAIN USING MAGNETIC RESONANCE SPECTROSCOPY

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**Background** By providing a non-invasive, functional insight, Magnetic Resonance Spectroscopy (MRS) has the potential to provide objective longitudinal data on mammalian brain development.

**Aim** To assess the sexual dimorphism in rodent brain chemistry and development using *in vivo* MRS.

**Methods** 26(19 male) Sprague-Dawley rats were scanned at 6wks and 20(16 male) at 10wks using a 7TMRI scanner. Testosterone concentrations were measured by ELISA. Metabolites were expressed as a ratio to creatine and full width at half-maximum (FWHM) of the water peak was used as a guide to the reliability of the ratios.

**Results** Median weight in 6wk males (M6) and females (F6), 10wk males (M10) and females (F10) was 197g(range,142–230), 131g (121–135), 316g(274–365) and 206g(191–210) respectively. Median anogenital distance (AGD) in M6, F6, M10, F10 was 2.46cm (1.89–2.9), 1.17cm(1.04–1.19), 3.25cm(2.8–3.6) and 1.33cm(1.07–1.60). Median serum testosterone in M6 and M10 were 1.33ng/ml (0.23–5.45) and 3.36ng/ml(1.75–8.26). 14 metabolites were identified in the occipitofrontal cortex. FWHM range was within the optimal range at 12–38Hz. In M6, myo-inositol ratios showed a positive association with circulating testosterone ( $p = 0.04$ ), and AGD was correlated with phosphocreatine ( $p = 0.033$ ) and glutamate ( $p = 0.045$ ). There was a difference between M6 and F6 in 3 metabolite ratios: phosphocholine ( $p = 0.014$ ), lactate ( $p = 0.046$ ) and NAA ( $p = 0.005$ ). In addition, in males, there was an increase from 6wks to 10wks in 3 metabolite ratios: taurine ( $p = 0.025$ ), myo-inositol ( $p = 0.012$ ) and phosphocholine ( $p = 0.005$ ).

**Conclusions** MRS is a reliable tool for studying the brain in maturing rats and may be a useful tool for studying the link between longitudinal changes in sex steroids and brain development.

### G95 ENDOCRINE LATE-EFFECTS POST-HAEMATOPOIETIC STEM CELL TRANSPLANT(HSCT) IN CHILDREN WITH HAEMOGLOBINOPATHIES

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Children with haemoglobinopathies undergoing HSCT are not exposed to total body irradiation but have specific endocrine issues, especially pubertal and growth delay related to iron toxicity. Experience is growing in HSCT in patients with haemoglobinopathies worldwide, but data on endocrine late-effects is scanty.

**Aims** To evaluate the endocrine late-effects seen in children with  $\beta$ -thalassaemia major( $\beta$ -thal) and sickle cell disease(SCD) post-HSCT focusing on gonadal, growth and thyroid effects.

**Methods** A retrospective audit was undertaken of all NHS patients aged less than 18 years who underwent HSCT and late-effects follow up at our centre from January 2001 to December 2011. The data was collected from hospital and electronic records.

**Results** 46 post-HSCT patients were identified; 29 with  $\beta$ -thal and 17 with SCD amounting to a total of 232 follow-up years. One patient(SCD) died on day 20 post-HSCT. Male to female ratio was 0.84(21/25). Median age at transplant was 8.68 years(range 2.2–17.6 years). 41/45(91.1%) patients received busulphan and cyclophosphamide as part of their conditioning regime. The remaining 4 received a reduced intensity regime(fludarabine, treosulfan, thiopeta and thymoglobulin). These patients have been excluded from late-effect analysis.

Gonadotrophins were abnormally raised in 10/22(45.5%) females and 4/19(21.1%) males during post-HSCT follow-up. More females 9/16(56.3%) than males 1/10(10.0%) in the pubertal age group required either pubertal induction or sex steroid replacement. FSH(Mean 45.56U/L) was more elevated than LH(Mean 20.68U/L) in all 9 females, indicating ovarian damage. Estrogen was used for secondary amenorrhoea in 3 patients(all SCD).

Only 4/41(9.8%) patients had compensated hypothyroidism post-HSCT. None required treatment.

At least 2 points of growth data were available in 34/45 patients. SCD patients(mean height SDS-0.21) were taller than those with  $\beta$ -thal(mean height SDS-1.32) pre-HSCT. There was no significant change in height SDS during follow-up. Only 1 male( $\beta$ -thal) had severe growth failure with a low IGF-1 but a normal GH stimulation test. He responded well to empirical GH.