Abstracts

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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1 A Lucas-Herald, 1 F Cann, 1 L Crawford, 1 C Durajczyk, 1 R McGowan, 1 SF Ahmed, 1 Department of Child Health, RHSC Yorkhill, Glasgow, UK; 2 Department of Clinical Genetics, North of UK Regional Genetics Service, Aberdeen, UK; 3 Department of Cytogenetics, West of UK Regional Genetics Service, Glasgow, UK; 4 Department of Cytogenetics, North of UK Regional Genetics Service, Aberdeen, UK

**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 aneuploidy 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 46, XX/46XY and 17(11%) had other variations of sex chromosomes. Of the 166 cases, 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** 17000 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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1 M Rodie, 2 M Welsh, 2 W Holmes, 2 L Gallagher, 2 J Mullin, 2 M McMillan, 2 M Macrae, 1 F Ahmed, 1 Department of Child Health, University of Glasgow, Glasgow, UK; 2 School of Life Sciences, University of Glasgow, Glasgow, UK; 3 Glasgow Experimental MRI Centre, Institute of Neurosciences and Psychology, University of Glasgow, Glasgow, UK

**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 7T MRI 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 1.53ng/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 = 0.003) 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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1 Y Baki, 1 S Chakravorty, 1 N Bridges, 1 L Karnik, 1 H Roberts, 1 J de la Fuente, 1 Y Mayo, 1 S Alexander, 1 Paediatric Endocrinology, Chelsea and Westminster Hospital, London, UK; 2 Division of Paediatrics, St Mary’s Hospital, London, UK; 3 Centre for Haematology, Imperial College, London, UK

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 β-thalassaemia major(β-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 β-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 6.85 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 patients received a reduced intensity regime(fludarabine, treosulfan, thiotepa and thymoglobulin). These patients have been excluded from late-effect analysis.

41/45(91.1%) patients received a reduced intensity regime(fludarabine, treosulfan, thiotepa 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 β-thal(mean height SDS-1.32) pre-HSCT. There was no significant change in height SDS during follow-up. Only 1 male(β-thal) had severe growth failure with a low IGF-1 but a normal GH stimulation test. He responded well to empirical GH.
Conclusion  Hormonal evidence of gonadal failure is more common post-HSCT in females than males. Growth and thyroid adverse effects are rare. Children with haemoglobinopathies seem to have a decreased burden of endocrine late-effects post-HSCT compared with oncology patients.

G96 A NATIONAL SURVEY OF EVALUATION AND TREATMENT OF HYPERTENSION IN PAEDIATRIC PATIENTS WITH DIABETES
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M Gupta, P Raffeeq, University Hospital of North Staffordshire, Stoke on Trent, UK

Aims We conducted a postal survey of paediatric diabetic units in NHS Hospitals across the United Kingdom regarding their practise of evaluation and management of hypertension in paediatric patients with both Type 1 and Type 2 diabetes.

Methods A questionnaire was sent to different units across the UK. Addresses of units were identified from the directory of diabetic care 2008. Questionnaires were sent to 151 units in month of June 2012. Response was awaited for 12 weeks. 69 responses were received. The data were analysed using Microsoft excel.

Results Out of 151 units 69 units replied, giving a response rate of 45%. Of the units that replied, 10% of the units have written guidelines. 88% of the units have some form of age and height based chart to identify hypertension. 50% of the units check blood pressure annually during diabetic annual review whilst other more frequently. Only 45% of the units consider microalbuminuria as a trigger to initiate investigation. 73% of the units undertake 24 hours ambulatory blood pressure monitoring prior to starting antihypertensive therapy. For further confirmation and management of hypertension 62% of the units refer these children for joint management with nephrologist. Our survey revealed a wide variation and inconsistencies in practise of evaluation and management of hypertension in this high risk patient group. There is also a variation in the choice of antihypertensive medication amongst different units.

Conclusion There is a need for national consensus on evaluation and management of hypertension in children with diabetes which will help in standardisation of the care and consequently reduce the morbidity related to its long term complications.

G97 RANGE OF URINARY STEROID METABOLITE RATIOS IN CHILDREN UNDERGOING INVESTIGATION FOR SUSPECTED DISORDERS OF STEROID SYNTHESIS
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1A Lucas-Herald, "M Rodie, N Liu, K Rankin, N Watson, M Donaldson, MG Shakh, J McNelly, D Shapiro, SF Ahmed, 1Department of Child Health, RHSC Yorkhill, Glasgow, UK; 2Department of Biochemistry, GR, Glasgow, UK; 2Department of Biochemistry, Southern General Hospital, Glasgow, UK

Background Calculation of a urinary steroid metabolite ratio (uSMR) may be a useful method of improving diagnostic yield when investigating disorders of steroid hormone synthesis.

Objective and hypothesis: To investigate the range of uSMR in children with suspected disorders of steroid hormone synthesis.

Population/Methods Ten ratios were calculated on steroid metabolite data analysed by GC-MS in urine samples collected between 2008–2010 from 219 children who were undergoing investigations. To obtain reference data, urine samples were also analysed in 89 children with no background of endocrine concerns and who had a urine sample collected at presentation to the hospital with an acute illness.

Results Of the 89 reference children, 36(40%) were male and median age at time of the test was 3 yrs(range,1month-11yrs). Of the 219 endocrine patients, 64(29%) were boys. In 129(59%) cases, a urine sample was collected to investigate early or exaggerated signs of adrenarche. Median age at test was 7.4yrs(1day-18yrs). Median and ranges of 2 steroid ratios used in the diagnosis of 21-hydroxylase deficiency are demonstrated in the Table.

Conclusions These novel data show that reference ranges for urinary steroid metabolite data need to be age matched. Most children with suspected disorders of steroid synthesis have a ratio which is within the reference range and the identification of outliers will lead to better targeting of genetic analyses.