O-1 Fractures In Boys With Duchenne Muscular Dystrophy And Their Relationship To Age
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Objective and hypotheses: A retrospective review of bone morbidity in a contemporary cohort of boys with Duchenne Muscular Dystrophy (DMD) managed in a Scottish tertiary neuromuscular centre. Method: Clinical details and results of bone surveillance were obtained in 47 boys, aged 9 years (2-16). DXA bone mineral content (BMC) at total body (TB) and lumbar spine (LS) were adjusted for bone area. Fractures were classified based on radiological confirmation. Results are in median(range). Results: 39/47(82%) were on steroid therapy and 26/47(55%) were ambulant. All were treated with Vitamin D(800-1000 units/day). Of 35 who had Vitamin D measured, 5(14%) had a level<25nmol/L. 5/10(50%) of those >14 years had delayed puberty and had testosterone therapy. 12(26%) sustained a total of 15 symptomatic fracture events. 12/15(80%) were appendicular fractures (AF) and 3/15(20%) were vertebral fractures (VF). AF occurred at a median age of 6years(2.5,14). The fracture distributions were 7(58%)tibia/fibula, 3(25%)femur and 2(17%)humerus/radius/ulna. Mechanisms of injuries were 11(92%) minor fall and 1(8%) occurred while being lifted. Median length of steroid exposure was 4years(0,10). 7/9(75%) were ambulant prior to fracture. 2/7(29%) lost ambulation after fracture. 3/12(21%) of AF occurred in steroid naive ambulant boys<3years. DXA and Vitamin D level within 1 year of AF showed TB BMC SDS 0.1(-0.8,1.0) and LS BMC SDS -0.2(-1.2,1.0). Vitamin D level was<25nmol/L in 2/10(20%). VF occurred at a median age of 11years(9,13). 2/3 were ambulant. Median length of steroid exposure was 6years(5,8). DXA within 1 year of VF showed TB BMC SDS 0.3(-0.2,1.1) and LS BMC SDS -0.1(-0.6,0.8). None had Vitamin D<25nmol/L. Conclusion: Symptomatic vertebral fractures occur in older children, with longer duration of steroid therapy. Appendicular fractures occur in younger boys and can also present in very young, ambulant, steroid naïve boys. Coincidental severe Vitamin D deficiency or reduced BMC were not common findings at a fracture event.

O-2 Novel Genetic Associations In Children With Disorders Of Sex Development (DSD) And Neurodevelopment Disorders - Insights From The Deciphering Developmental Disorders (DDD) Study
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Background: Collaborative project to review the phenotypic and genotypic data from children recruited to the UK wide DDD study. Objective and hypotheses: To report the frequency and range of DSD phenotypes observed in DDD participants who have one or more associated 'neurodevelopmental delay' diagnostic Human Phenotype Ontology (HPO) term. Method: Retrospective review of anonymized data from participants in the DDD study. Results: Of 7439 DDD participants recruited, 603 (8%) had at least one HPO term in the 'abnormalities of the genital system'. Of these 603 children, 370 (61%) had at least one 'neurodevelopmental delay' diagnosis with a total of 447 DSD phenotypes, the majority, 420 (94%) abnormalities of the external genitalia. Of the male external genitalia abnormalities, 212 (54%) were testicular, 74 (19%) were hypospadias, 57 (15%) were penile and 47 (12%) were other abnormalities. Testicular abnormalities included unilateral cryptorchidism, bilateral cryptorchidism, hydrocele and other phenotypes. Causative mutations were found in 14 genes already listed on the Developmental Disorder Genotype Phenotype (DDG2P) database (https://decipher.sanger.ac.uk/), confirming a range of syndromic diagnoses with associated DSD, including: KBG syndrome, Meier-Gorlin syndrome, Alpha-thalassemia/mental retardation syndrome, Kabuki syndrome and Donnai-Barrow syndrome. Of these likely pathogenic mutations, 6 of 14 (43%) were found in DDG2P genes not previously associated with DSD. Conclusion: A wide range of DSD phenotypes occur in about 6% of patients with learning difficulties. Recognition of these associations should not be overlooked in the management of patients with complex conditions. Exomic sequencing through projects like DDD increases diagnostic yield whilst the identification of mutations in developmental genes may improve understanding about the pathogenesis of DSD.

O-3 Determining the pattern and prevalence of excessive alcohol consumption in pregnancy in Glasgow by measuring biomarkers in meconium.
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Background: Pregnant women commonly under-report alcohol consumption. The half-life of maternal biomarkers is short, therefore accurate data for developing and monitoring public health strategies are not available. Ethanol crosses the placenta and is partly conjugated in the fetus to fatty acid ethyl esters (FAEEs) and ethyl glucuronide (EtG), which are deposited in meconium. Raised FAEE (>600 ng/g) and EtG (>30 ng/g) levels in meconium are indicative of alcohol consumption in pregnancy.[1,2] Recent evidence suggests EtG may be a more useful biomarker.[2] Aims: To assess the feasibility of FAEE and EtG measurement in meconium as an estimate of alcohol consumption in pregnancy, and to explore relationships between these biomarkers and demographic factors including maternal age, parity, smoking, ethnicity and socio-economic status. Methods: A sample of meconium was sought from every infant > 36 weeks' gestation born every 8th day at Princess Royal
Maternity, Glasgow. Newly delivered mothers were asked to retain the first meconium nappy. If retrospective written, informed consent was given, the sample was frozen and analysed for FAEE and EtG concentration (University of Firenze and Padova, Italy). Results: 235 samples of meconium were obtained (67% of eligible babies). FAEEs were detected in all. 98 (42%) samples had FAEE concentrations >600 ng/g, including 4 samples with FAEEs below the limit of quantitation (LOQ) (10 ng/g). EtG was detectable in 93 (40%) samples. 23 (10%) had EtG levels 30 ng/g. No mother reported heavy alcohol consumption in pregnancy. FAEE was weakly correlated with EtG (Pearson 0.327; p<0.001). There was no correlation between either biomarker and birth weight, head circumference, maternal age, parity, smoking, ethnicity or postcode. Conclusions: The prevalence of raised alcohol biomarkers in meconium in Glasgow is significant and similar to that reported from other studies. Further investigation of this is required.


O-4 The Existence Of An Androgen Responsive Transcriptome In The Peripheral Blood Of Boys Extends The Utility Of The HCG Stimulation Test

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Background The hCG stimulation test is a valuable method for assessing androgen production but there is a need to explore its utility in assessing androgen responsiveness and long-term prognosis. Our aim was to explore the effect of hCG stimulation on the peripheral transcriptome in boys undergoing investigation for DSD. Methods 13 boys undergoing investigation for 46XY DSD received IM hCG 1500u on 3 consecutive days and had blood sampling on D0 and D3. RNA was extracted from peripheral blood mononuclear cells using RNA Blood Mini Kit. Microarray hybridisation was performed using the Affymetrix Human Transcript Array (HTA) 2.0. Results Median age (range) at test was 0.83yrs(0.18-11.23) with a median External Masculinisation Score of 9(6-11). 3 boys had isolated proximal hypospadias, 6 had bilateral undescended testes and 4 had a combination of hypospadias, impalpable testes or micropenis. Median pre and post hCG testosterone were <0.5nmol/l (<0.5-6) and 7.9nmol/l (<0.5-31.5), respectively. Median fold change of testosterone was 6.8 (1-26.6) and 3(23%) boys did not demonstrate a testosterone rise (non-responders). Median AMH in the responders was 688pmol/l (24, 1628) and in the non-responders was <4pmol/l (<4,256). 8(80%) of the responders and 2(66%) of the non-responders had AR mutation analysis performed and had no variant detected. When corrected for gene expression changes in the non-responders, all 10 of the responders demonstrated a 20% or greater increase in the expression of piR-37150, a non-coding piwi-interacting RNA. 8(80%), 6(60%) and 4(40%) of the responders demonstrated a 30%, 40%
and 50% rise respectively in a total of 5 piRNAs. Conclusions The identification of a dynamic peripheral transcriptome that is associated with an androgen response following hCG stimulation extends the potential value of this clinical test. The role of piRNAs as a diagnostic and prognostic marker of gonadal function needs further investigation.

**O-5 Exclusive breastfeeding, HIV exposure, and child development**

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**Background:** Exclusive breastfeeding (EBF) is associated with early child health; longer-term benefits on child development remain inconclusive. We examine associations between EBF, maternal HIV and other current/early life factors, with child development at ages 7-11 years in rural South Africa.

**Methods:** The Vertical Transmission Study (VTS), 2001-2006, supported HIV-positive and negative women to exclusively breastfeed, and was instrumental in changing International HIV and infant feeding policies. In 2013 HIV-negative VTS children (345 HIV-exposed, 596 HIV-unexposed), were re-enrolled into a study to examine their cognition (using KABC-II), executive function (using NEPSY-II), and emotional-behavioural functioning (using CBCL: Child Behaviour Checklist). Same-aged HIV-negative children (n=629) from the local Demographic Platform provided comparative population means. For each outcome we split the VTS sample into scores above or at/below the population mean. We modelled each outcome using logistic regression analyses, allowing for early life factors (including maternal HIV), overall and stratified by child sex. Results: Six months EBF vs 1 month, was associated with fewer conduct disorders (anti-social behaviour) (aOR 0.44 [95%CI 0.2-0.7]) in both sexes. For boys, 2-5 months EBF vs 1 month was associated with improved cognition on the KABC Learning Ability sub-scale score (measuring focused attention and storing of audio-visual stimuli) (aOR 2.07 [95%CI 0.9-4.2]) and fewer externalising problems (general behaviour problems) (aOR 0.48 [95%CI 0.2-1.0]). Improved cognition in both sexes was associated with higher maternal cognitive ability (aOR 1.43 [95%CI 1.0-1.9] Sequential Processing, 1.74 [95%CI 1.2-2.3] Planning subscales). Current maternal mental health problems and parenting stress were associated with increased emotional-behavioural problems on the total CBCL (aOR 2.44 [95%CI 1.2-4.5]; aOR 7.04 [95%CI 4.1-11.9] respectively). Maternal HIV status was not associated with any outcomes.

**Conclusion:** Exclusive breastfeeding has long term benefits particularly for boys in this setting. HIV-exposed children performed as well as HIV-unexposed children in the domains examined.
O-6 Survival Outcome of Children with End Stage Renal Failure Requiring Renal Replacement Therapy: 1973-2014

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Chronic renal failure is recognised to influence mortality and reduce quality of life. Outcome data for paediatric patients requiring renal replacement therapy (RRT) due to end-stage renal failure (ESRF) is often based on small cohorts with logistics of continued surveillance following transition to adult services resulting in a significant patient loss when collecting longitudinal data. The introduction of a uniform database linking services in Scotland has facilitated data sharing between paediatric and adult nephrologists, providing data on the outcome of paediatric patients. We present survival data for children with ESRF requiring RRT in Scotland from 1973-2014. Patients identified retrospectively using the national renal database (SERPR) as commencing RRT between July 1973 and May 2014 in the single centre providing RRT for children in Scotland. Patients who recovered renal function following RRT for acute renal failure were excluded from the study. 280 patients identified: 167 male/113 female. Median time of follow up was 12.3 years with a total of 4,921.2 patient years analysed. 66 patients had a secondary cause of ESRF coded. Median age at commencing RRT 10.4 years. 233 patients received a renal transplant with 319 transplants occurring in the last 41 years. Median number of days from RRT to first transplant was 495 with 27 patients receiving a preemptive renal transplant. 16 patients developed malignancy after commencing RRT (4 prior), however this includes all patients with PTLD. 161 patients were known to be alive and 73 deceased. Average age at death 15.3 years. Cause of death Cardiovascular 10 Infection 7 Haemorrhage 3 Metabolic 2 Malignancy 2 Post operative transplant 8 Other 8 Unknown Cause 34 Despite advances in the care of children with ESRF in the paediatric age group there remains a significant increase in both morbidity and mortality with a significant reduction in life expectancy for children entering ESRF.

O-7 The Effect Of High Dose Vitamin D Supplementation On Markers Of Bone Metabolism & Immune Status In Children With Vitamin D Deficiency.

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Objectives To assess the effects of short term vitamin D supplementation on bone metabolism and immune function in vitamin D deficient children. Method Treatment with daily 5000 IU Cholecalciferol supplementation for 6 weeks. At baseline and end of treatment serum 25 hydroxyvitamin D (25OHD), parathyroid hormone (PTH), alkaline phosphatase (ALP) and serum collagen type 1 cross-linked C-telopeptide (CTX) were measured. Leukocyte subsets analysis was performed for T & B cells and T regulatory cells and a luminex assay was used to measure IL2, IL4, IL5, IL6, IL8, IL10, IL12, IL17, EOTAXIN, MIP-1b, IP-10, TNF α, INF γ, RANTES, MCP-1. Results 19 children enrolled in the study with median (range) age of 5 yrs (10 months, 9.5 yrs). Between 0 and 6 weeks,
25OHD increased from 28 (14, 125) nmol/l to 110.5 (37, 225) nmol/l, p < 0.0001, PTH decreased from 6.6 (3.6, 134) pmol/l to 4.3 (1.2, 6.8) pmol/l, p < 0.0001, ALP decreased from 225 (99, 2834) u/l to 4.3 (64, 729) u/l, p < 0.002. Additionally, we did not find any statistically significant changes in the level of cytokines/chemokines over time. Eight children underwent leukocyte subsets (T/B cells) and T regulatory cells with no significant change over time. At baseline, a significant univariate association was observed between 25OHD and IP10, ALKP and IL2, IL4, IL6, IL8, IL10, IL12, IL17, TNFα and IFN-g, and CTX and IL10 and IL17, and, finally, PTH and IL17. Mixed Effect Modelling showed that age, IL4, IL8, IL10 and TNFα are significant independent predictors for 25OHD. Additionally, IL10 and TNFα are significant independent predictors for both ALP and PTH levels. Conclusion Serum level of 25OHD and bone biomarkers of Vitamin D deficiency show an improvement. In children, the extent of Vitamin D deficiency is associated with an alteration in multiple cytokines.

O-8 Electrolyte imbalances and the choice of maintenance intravenous fluid therapy for children in a tertiary paediatric hospital

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BACKGROUND Using hypotonic fluid in children can cause hyponatraemia leading to severe morbidity and even mortality as highlighted in several national reports and at our hospitals morbidity meetings. Increased antidiuretic hormone production secondary to the stress response contributes to the development of hyponatraemia. AIMS/OBJECTIVES To 1) Define the incidence and extent of hyponatraemia in RHC Glasgow. 2) Examine in principle if replacing hypotonic maintenance fluid with isotonic fluid would reduce the risk of hyponatraemia without exposing paediatric patients to other electrolyte abnormalities. METHODS Basic biochemistry results over a year were analysed. Our primary endpoint was the occurrence of severe hyponatraemia (Na+ <130mmol/L). Secondary outcomes were the occurrence of severe hypernatraemia (Na+ >150mmol/L), hypokalaemia (K+ <3mmol/L), hyperkalaemia (K+ >5.5mmol/L), hyperchloraemia (Cl- >110mmol/L) and high serum bicarbonate (HCO3- >130). RESULTS There were 238 incidences of severe hyponatraemia involving 44 neonates, 45 infants and 149 children. The area of highest incidences was A&E (20%) followed by NICU (19.7%), Schiehallion/Oncology ward (18%) and Short Stay (14.7%). There were 110 incidences of severe hypernatraemia, 263 of hypokalaemia, 257 of hyperkalaemia, 1005 of hyperchloraemia and 138 of high serum bicarbonate. DISCUSSION RHC Glasgow has a high rate of hyponatraemia, much of which presents on admission. There is also a high incidence of hyperchloraemia. Using hypotonic saline as standard maintenance fluid could be contributing to acquired electrolyte imbalances and worsened pre-existing hyponatraemia. The lack of near-patient testing in some clinical areas and the lack of clinician awareness about the seriousness of hyponatraemia contribute to the poor selection of intravenous fluids. CONCLUSION We need to raise awareness among medical staff through education about the issues surrounding hyponatraemia. We suggest reviewing the hospitals standard fluid maintenance policy moving
towards Plasmalyte, which contains a mix of electrolytes that represent physiological electrolyte balance most closely amongst all available intravenous fluids.

O-9 Gene Panel Testing For Children With 46,XY Disorders Of Sex Development

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Background: 46,XY Disorders of Sex Development (DSD) represent a challenging and heterogeneous group of conditions. To date under half of those raised as boys have a definitive clinical diagnosis and only 20% receive a molecular diagnosis. Aims: To introduce and evaluate a diagnostic gene panel for the testing of 46,XY males with DSD. Methods: A multidisciplinary clinical DSD Diagnostic Group identified a group of 46,XY boys with DSD who had undergone clinical evaluation at the Royal Hospital for Children in Glasgow. DNA samples for these patients were analysed by Sanger sequencing for mutations in AR, NR5A1, SRY, SRD5A2, HSD17B3, MAMLD1 and DAX1. Multiplex Ligand-dependent Probe Amplification analysis was used to study for copy number variation. The pathogenicity of any variant found was determined using a combined approach of software analysis (Alamut v2.5), literature review and discussion at the DSD Diagnostic Meeting. Polymorphisms and variants which were unlikely to be pathogenic were excluded from analysis. Results: Of the 65 boys who had DSD gene panel testing, median age at time of evaluation was 1 year (range 1 day-19 years). A family history of DSD was present in 10(15%). Complete analysis was not possible in 13(20%). Five (8%) had other chromosomal rearrangements. Of those with complete analysis, 3(6%) had mutations in NR5A1 and 4(8%) had mutations in SRD5A2. The median External Masculinisation Score of the boys with NR5A1 and SRD5A2 mutations was 9 (range 6-9) and 7 (range 5-9). Two of the children with SRD5A2 mutations were related. Overall mutation detection rate was 15%. Discussion: Gene panel testing, guided by a multidisciplinary diagnostic panel, offers a standardised approach to the diagnosis and management of people with 46,XY DSD. In our population, likely pathogenic mutations were observed in 15% of eligible individuals for panel testing, most commonly in SRD5A2 but also in NR5A1.

O-10 Quantitative PCR using patient specific primers detects occult central nervous system involvement in more than one-third of children with acute lymphoblastic leukaemia

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Background: Despite the excellent overall survival in childhood acute lymphoblastic leukaemia (ALL), central nervous system (CNS) disease continues to pose challenges. Currently, only 3-5% children with ALL present with cytological evidence of CNS involvement, however the majority of CNS relapses occur in children who had negative CNS cytospins at diagnosis. There is a clear need for improving diagnostic accuracy of CNS disease. Aims and Objectives: Leukaemic cells, being clonal in origin, carry VDJ gene rearrangements unique to individual patients. TaqMan qPCR identification of leukaemia using allele specific oligonucleotides (or ASO primers) targeting these rearrangements provides accurate assessment of submicroscopic levels of leukaemia in the bone marrow. We investigated whether this method can be utilized to identify patients with submicroscopic levels of CNS disease. Methods and Results: After obtaining informed consent from 57 patients with ALL, diagnostic cerebrospinal fluid (CSF) samples were collected. Following careful investigation of the most suitable methods for DNA extraction and quantification, CSF samples were tested for presence of leukaemic DNA. Samples from 38 patients with no evidence of CNS disease were suitable for analysis. Samples from 15/38 patients (39.5%) tested positive by qPCR. In 7 qPCR positive patients, two sets of ASO primers/patient were tested. Notably, qPCR amplification was seen in only 1/2 primer sets in 3/7 patients suggesting possible clonal diversity between CNS and BM populations. CSF qPCR positivity was seen in patients with both high- and low-risk clinical and cytogenetic features. Follow up samples from 19 patients collected at the end of induction were also tested. All samples tested negative by qPCR suggesting clearance of CNS disease. Discussion and Conclusions: Overall, these findings suggest that sub-clinical CNS disease is likely to be present in more than one third of newly diagnosed patients. This study highlights the lack of sensitivity in diagnosing CNS disease with cytological methods and provides a rationale for risk-stratified CNS-directed therapy.

O-11 Childhood asthma exacerbations and the Arg-16 beta2 receptor polymorphism

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Introduction Response to asthma treatment is heterogenous within the population. The Gly-to-Arg substitution at the 16 position (rs1042713) in the beta 2 adrenoceptor (ADRB2) gene is associated with enhanced down-regulation and uncoupling of beta-2 receptors and there is evidence that this genetic variant influences response to long acting beta agonist treatment for asthma. Our aim was to undertake a meta-analysis to test the hypothesis that there is an interaction between the A allele of rs1042713 (Arg16 amino acid) and long acting beta agonist (LABA) exposure for asthma exacerbations in children. Methods. Children with diagnosed asthma were recruited in five populations (BREATHE, GALA II, PACMAN, PAGES and PASS). A history of recent exacerbation and asthma treatment were determined from questionnaire data. DNA was extracted and the Gly16Arg genotype determined. Results. Data from 4226 children of white Northern European and Latino origin were analysed and the odds ratio for exacerbation increased by 1.52 [1.17, 1.99] p=0.0021 for each copy of the A allele among the 637 children treated with inhaled corticosteroids (ICS) plus LABA.
but not for treatment with ICS alone (n=1758), nor ICS plus leukotriene receptor antagonist (LTRA, n=354) or ICS plus LABA plus LTRA (n=569). The effect size was greatest among children of Latino origin. Conclusions. The use of LABA as “add-on controller”, but not LTRA, is associated with increased risk of asthma exacerbations in children carrying one or two A alleles at rs1042713. Prospective genotype stratified clinical trials are now required to explore the potential role of rs1042713 genotyping for personalised asthma therapy in children.

O-12 The impact of cellular age on Nup98HoxA9 leukaemic transformation
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Background Despite age related disease heterogeneity, treatment of paediatric acute myeloid leukaemia is often extrapolated from adult trials. However, proliferative and differentiative potential decrease as haemopoietic stem cells age. We hypothesise that cellular age influences leukaemic transformation. Aims/Objectives To determine whether haemopoietic stem and progenitor cell (HSPC) age affects oncogene-mediated leukaemic transformation in vitro. Methods Murine HSPCs including Lin-sca1+cKit+ (LSK), common myeloid progenitor (CMP) and granulocyte-macrophage progenitor (GMP) cells representing infancy (foetal liver (FL)), childhood/adolescence (3 weeks(w)) and adulthood (10 and 60-70w) were transduced with the fusion oncogene Nup98HoxA9. Leukaemic transformation was assessed in vitro by serial colony forming cell (CFC) assays. 44 genes associated with leukaemic transformation were selected. Gene expression was assessed by high throughput qPCR in LSKs from all ages, before and after oncogene expression and compared to transformed LSKs from CFC assays (3 replatings). Results/Discussion LSKs from all 4 ages were transformed by Nup98HoxA9. However, FL CMPs and GMPs did not transform, whereas post-foetal (3w, 10w and 60-70w) CMPs and GMPs did. This suggests the ability of foetal cells to undergo transformation may rely on specific features of the LSK population that is absent from more committed CMP and GMPs. Normal LSKs have distinct age-specific transcriptional profiles, reflecting their age-specific biology. We assessed a selection of leukaemia associated HSPC genes to understand whether Nup98HoxA9-mediated leukaemogenesis from LSKs in all 4 ages was comparable at the transcriptional level. Early growth factor 1 (Egr1) maintains quiescence in normal haematopoiesis. Without Nup98HoxA9, Egr1 expression is higher in post-foetal LSKs compared to FL LSKs. However, in the presence of Nup98HoxA9, Egr1 is specifically upregulated in FL LSKs, indicating Egr1 may be a distinct target for oncogene-mediated transformation only in FL cells. Future work will determine whether Egr1 upregulation determines whether a cell is transformable (FL-LSK) or not (FL-CMP and FL-GMP).
O-13 Association of ACYP2 variants with cisplatin-related ototoxicity in a UK cohort of paediatric cancer patients

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BACKGROUND: Cisplatin is a chemotherapeutic agent used to treat solid malignancies in childhood. Although highly effective, its therapeutic index is narrow and neurotoxic side effects occur frequently. Ototoxicity occurs typically as bilateral, irreversible, high-frequency sensorineural hearing loss in at least 50% of children but there is significant inter-individual variability in susceptibility. Genetic variants of several genes have been proposed to be associated with cisplatin-induced ototoxicity. Most recently, ACYP2 was identified through a genome-wide association study.

AIM: To determine the occurrence of the ACYP2 risk genotypes in a UK cohort.

METHODS: Retrospective, multicentre cohort study. Audiograms were graded according to Chang criteria. SNP rs1872328 was selected and a TaqManGeneassay conducted according to the manufacturer’s instructions. Statistic analysis was conducted using both univariate and multivariate ordinal logistic regression models. The likelihood ratio test was applied to compare the two models with and without the variant and thus assess for statistical significance of the SNP based on an additive model.

RESULTS: 115/149 childhood cancer patients from six UK paediatric oncology centres fulfilled the inclusion and quality control criteria and were included in the analysis. 74/116 had developed hearing loss. In the multivariable analysis clinical factors associated with an increased risk of hearing loss (p < 0.05) were younger age, cranial irradiation and increased cumulative dose of cisplatin. ACYP2 was not found to be a significant risk factor (p = 0.059).

DISCUSSION: Our study confirmed known clinical risk factors for cisplatin-induced ototoxicity. A genetic association with ACYP2 could not be demonstrated in our cohort. It is likely that the reason for this controversy is multifactorial and influenced by factors such as the retrospective nature of study, the size and heterogeneity of the study population with regards to diagnosis, age range, dosage, treatment schedule, hearing grading, co-administration of concurrent ototoxic agents and cranial irradiation.

O-14 Fermentation capacity of gut microbiota in patients with inflammatory bowel disease compared to healthy controls

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Background: Gut microbiota in the colon ferment undigested dietary fibre to produce short-chain fatty acids (SCFA). SCFA have beneficial properties which may improve inflammatory bowel disease (IBD). Differences in microbiota composition and metabolic activity have been described between IBD patients and healthy controls.

Aim: This project explored the capacity of the gut microbiota of
IBD patients to breakdown dietary fibre. Methods: Fresh faecal samples were collected from IBD patients and healthy controls (HC). In vitro batch culture fermentations were carried out for 8 carbohydrate/fibres (maize starch, pectin, raftilose, wheat bran, cellulose, mixed fibres, inulin butyrate ester and inulin propionate ester). Aliquots were taken at 0, 4, 24 and 48 hours. SCFA concentration (analysed using gas chromatography), pH and gas volume production were measured. Results: Five IBD participants and four matched HC were recruited. HC were matched according to age, sex and body mass index (BMI). Total SCFA concentration was significantly lower for IBD participants at 24 hours for maize starch, pectin, wheat bran, cellulose (all p=0.04) and butyrate ester (p=0.02) substrates. Faecal pH of ferments of IBD patients was lower than HC for butyrate ester (p=0.04) and tended to be higher for most of the other substrates (all but raftilose and wheat bran) at 0 hours (p=0.04-0.09). Total gas production tended to be greater for HC than IBD patients in maize, raftilose, butyrate and propionate esters (only significant for propionate ester, p=0.04).

Conclusions: This preliminary dataset describes a trend towards lower SCFA production in IBD patients compared with healthy controls. This may illustrate that their microbiota has a lower fermentation capacity to break down fibre, compared to healthy people.

O-15 A review of the diagnosis of von Willebrand disease in paediatric patients using the new United Kingdom Haemophilia Centre Doctors Organisation (UKHCDO) guidelines

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Background Currently a diagnosis of von Willebrand disease (VWD) may be made in individuals with mucocutaneous bleeding symptoms and a von Willebrand factor (VWF) activity level <0.50 iu/ml. Recent UKHCDO guidelines have proposed new diagnostic criteria. These recommend that only those with appropriate symptoms and an activity level <0.30 iu/ml should be diagnosed as having VWD, and those with activity levels between 0.3-0.5iu/ml should be classified as 'low VWF'. Aim To review the diagnosis of VWD in paediatric patients using the new UKHCDO guidelines. Methods This was a retrospective audit of all paediatric patients with VWD who were managed at the Royal Hospital for Sick Children Glasgow at the time of data collection (20/11/2014-27/11/2014), as identified from the National Haemophilia Database. Data was collected from case notes, clinical portal and telepath. Results The total audit population was 114, of which 68(60%) had VWF activity levels between 0.3-0.5iu/ml. 35 patients had mutation analysis performed at time of diagnosis. 25%(7/35) of those with a proven genetic mutation had VWF activity levels between 0.3-0.5iu/ml. 30 individuals presented due to bleeding symptoms whilst 84 were investigated and diagnosed due to family history. Discussion The new UKHCDO guidelines lack a proposed management plan for individuals reclassified as 'low VWF'. There are a few factors unique to the paediatric population which make management a particular challenge, of which one is the absence of a significant bleeding history in many young children. Under the new diagnostic criteria 60% of the population would be reclassified as 'low VWF', including 7 with a confirmed genetic mutation. It would be unreasonable to suggest that they are all suitable for discharge, particularly as some have required
treatment in the past. Further work should focus on bleeding symptoms and treatment requirements in the individuals with 'low vWF' in order to guide management.

O-16 Metformin regulates the differentiation of murine mesenchymal stem cells via AMPK-independent suppression of p70s6-kinase
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Introduction Metformin is widely used as oral anti-hyperglycaemic agent to treat Type 2 diabetes, with increasing reports of an additional, potential bone protective role. Objective We investigated the role of AMPK in mediating the effects of metformin on the differentiation of MSCs to either osteoblasts or adipocytes. Methods Confluent murine MSCs (C3H10T1/2) were treated with metformin (500µM), a known AMPK activator (A769662; 100µM) or the p70S6K inhibitor (rapamycin; 10µM), in both control and adipogenic-inducing environments (using pioglitazone; 10µM) for 5 days. Nuclear extracts were separated by SDS-PAGE and immunoblotted with primary antibodies to peroxisome proliferator-activated receptor gamma (PPAR\(\gamma\); marker for adipogenesis), Runt-related transcription factor 2 (Runx2; marker for osteogenesis), phosphorylated-ACC (P-ACC(Ser79); marker for AMPK activity) and phosphorylated-p70s6k (P-p70s6k(Thr389); upstream regulator of mTOR signalling). Immunoblots were scanned using a Licor fluorescent reader. PPAR\(\gamma\) and Runx2 activities were determined using Luciferase reporter assays and adipogenesis was quantified histochemically by staining neutral lipids with Oil Red O. Results MSCs treated with pioglitazone demonstrated marked adipogenic phenotype staining positively with Oil Red O. In contrast, treatment with both metformin and A769662 impaired adipogenesis. Pioglitazone induced an (p<0.01) increase in PPAR\(\gamma\) expression, whilst metformin and A769662 suppressed PPAR\(\gamma\) expression to basal levels, p<0.05 and p<0.01 respectively. Runx2 activity was significantly increased by metformin (p<0.001) and A769662 (p<0.001) but not Runx2 protein levels. As expected, A769662 promotes phosphorylation of ACC, but not so with metformin. Instead, metformin suppressed (p<0.05) the phosphorylation of p70s6k, as did A769662 (p<0.05) and rapamycin (p<0.001). Luciferase reporter assays confirmed the reciprocal action of metformin on adipogenesis and osteogenesis, namely suppression of PPAR\(\gamma\) activity (p<0.001) and induction of Runx2 activity (p<0.001). Conclusion Metformin suppresses adipogenesis of C3H10T1/2 cells through the reciprocal regulation of PPAR\(\gamma\) and Runx2. These results present novel mechanisms of action for metformin on MSC differentiation which is largely AMPK-independent, involving the suppression of p70S6K activity.
POSTERS

P-1 Longitudinal Changes In Bone Marrow Adiposity And Its Relationship To Diabetes Control In Young Women With Type 1 Diabetes Mellitus
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Context: The pathophysiological mechanism of increased fractures in young women with Type 1 Diabetes Mellitus (T1DM) is unclear. Objective: Prospective, longitudinal study of trabecular bone microarchitecture and vertebral marrow adiposity in young women with T1DM and a control group of healthy women. Patients & Settings: 17 women with T1DM with a median (range) age of 22.2 yrs (16.6, 32.4) attending one outpatient clinic with a median age at diagnosis of 10.1 yrs (4.8, 14.8) were compared to 11 age-matched healthy women who acted as controls. Methods & Main Outcome Measures: Measurements included MRI-based assessment of abdominal adipose tissue, proximal tibial bone volume/total volume (appBV/TV), trabecular separation (appTb.Sp), vertebral bone marrow adiposity (BMA) at baseline and 12 months. Results: Median appBV/TV in cases and controls was 0.31 (0.22, 0.37) and 0.33 (0.28, 0.4), respectively (p=0.05) and median appTb.Sp in T1DM was 2.57 (2.24, 3.15) and 2.32 (2.03, 2.73), respectively (p=0.02). There was no difference in median BMA which was 26.2% (12.1, 62.1) and 22.4% (9.6, 41.9) in cases and controls, respectively (p=0.57). Over the 12 month period, there was no significant change in these parameters. Although, there was no association between change in bone microarchitecture parameters and HbA1c in the cases, there was a strong correlation between change in HbA1c and change in BMA (r, 0.8, p=0.002).

Conclusion: Longitudinal MRI studies of trabecular bone show that over a period of one year, improvement in diabetes control is associated with a reduction in bone microarchitecture deficits may persist.

P-2 Infant and young child feeding practices in an urban slum in Nairobi, Kenya
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Background and Aims Little is known about feeding and hygiene practices and their impact on food acceptance and nutrition status in urban slums in Kenya, where stunting is highly prevalent. We aim to describe these practices in an urban slum in Nairobi. Methods This was a cross sectional meal time observation study in Mukuru slum. Carers of children (6-24 months) visiting 3 clinics were recruited in August 2014 and July 2015. Anthropometry, interviews and midday meal observations were carried out. Results Nineteen children (9 male, 10 female), median age 12[6 to 21.6] months participated of which 11(58%) were malnourished (<-2SD for weight, height or BMI z scores). Most children 13(healthy, 5 malnourished) were observed eating home foods which consisted mainly of carbohydrates, but 6 malnourished children were served ready to use therapeutic food (RUTF). Poor hygiene practices were observed in most homes (14/19): none of the caregivers washed their hands before handling food and feeding the child. Non responsive feeding styles were common 9/19(47%) during meals. Restraining the child's hands during feeding occurred in 7/19(37%) cases, but one
month old malnourished child was left alone to self-feed. Most healthy children 5/8 (63%) and children on RUTF 4/6 (67%), were calm and ate more than half their food, despite lack of encouragement. In contrast 3/5 (60%) malnourished children, consumed less than half their meals and either spit out, cried or turned away when offered food. Two caregivers responded to this by force feeding. Breastfeeding before/during meals was more common in malnourished children eating home foods 2/5 (40%) than those on RUTF 1/6 (16%). Conclusion Non responsive child care and low dietary diversity were common. Malnourished children tended to be fussy eaters when eating home foods, but not when eating RUTF. For effective intervention, knowledge of factors that motivate feeding and hygiene practices is needed.

P-3 Micronutrients in plasma and erythrocytes in children with Crohn’s Disease and Phenylketonuria compared to a cohort of healthy children

Janis Armstrong

Background Assessment of micronutrient status in children is complicated by a lack of suitable age-specific reference ranges. Moreover, in disease, particularly in the presence of systemic inflammation, interpretation of plasma biomarkers becomes unreliable and can be misleading in clinical practice. Measurements of micronutrients in other cell matrices (erythrocytes), whose concentration is not influenced by the systemic inflammatory response, may be a novel marker of actual micronutrient body stores. Objectives To develop paediatric reference ranges for micronutrients in plasma and erythrocyte samples from healthy children (HC) using a centile-based method, and to explore their performance via calculation of micronutrient concentration z-scores versus those for children with Crohn's Disease (CD) and Phenylketonuria (PKU). Methods Micronutrient data were measured from redundant blood samples from apparently healthy children (n=244) admitted for benign conditions at the Royal Hospital for Sick Children, Glasgow. These data were used to generate centile charts and z-scores for a range of micronutrients in plasma (Copper, Magnesium, Selenium and Zinc) and erythrocytes (Copper, Magnesium, Manganese, Pyridoxine, Riboflavin, Selenium, Thiamine and Zinc). These were then used to calculate z-scores from micronutrient concentration data for Crohn's (n=25) and PKU (n=41) children in an attempt to identify disease-specific deficiency or excess. Micronutrient centile plots were developed for all micronutrients tested in plasma and some in erythrocytes. When we used these novel references, children with PKU and Crohn's disease had significantly lower Selenium compared to HC (0.0001 PKU erythrocyte; 0.0001 Crohn's erythrocyte; 0.0001 Crohn's plasma). PKU children also had lower plasma Copper (p=0.002) and Zinc (p=0.022), but higher erythrocyte Zinc (p=0.0003) than HC, while those with Crohn's disease had lower plasma Zinc (p<0.0001) but higher plasma copper (p<0.0001) and whole blood thiamine (p<0.0001). Conclusion We have developed new reference ranges and showed their utility in assessing micronutrient deficiencies in chronic illness.
P-4 A stratified approach to paediatric epilepsy genetics
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Background: Epilepsy is the commonest serious neurological disease, affecting about 50-60 million people worldwide. Until very recently the cause of most people’s epilepsy was not well understood. Yet over the past 15 years the advent of modern genetic technology has given us huge insights into aetiology and pathogenesis, with over 500 single genes having been reported in association with the disease. It is estimated that 60 percent of all epilepsy can be explained through genetic factors.

Knowledge of genetic causation offers a number of benefits to patients and clinicians, including offering explanation, guiding management decisions, and counselling on recurrence risk. Yet with so many genes to consider testing for the epilepsy specialist is faced with a new challenge - information overload.

Objective: To create an epilepsy genetic database. Epilepsy specialists should be able use this database to gather information on the phenotypic features associated with mutations in genes associated with epilepsy. To allow clinicians to filter a list of genes by phenotypic features so that genetic testing can be stratified according to phenotypic features.

Methods: Genes associated with epilepsy were identified by the following means: Extensive Medline literature review using the MeSH terms ‘Epilepsy’ and ‘Gene’; Expert opinion from Glasgow paediatric epilepsy and genetic specialists; Lookup of global commercially available and UK Genetic Testing Network (UKGTN) approved next generation sequencing (NGS) panels for epilepsy. Papers relating to specific genes were reviewed.

The phenotypic features associated with variants were summarised and tabulated.

Results: A database of 215 epilepsy-associated genes has been created. 129 of these genes have been prioritised for inclusion in the new Glasgow epilepsy gene panel. 68 of these genes are not on any other UKGTN approved panel. Pathogenic variants in 45 of these genes can present with early infantile epileptic encephalopathy, and in 23 can present with progressive myoclonus epilepsy. Clinicians can search by any one of 155 different clinical features to refine their gene search.

Conclusion: In an age of increasingly large gene panels, this resource can help clinicians and genetic laboratories stratify their testing approach in epilepsy.

P-5 A comparison of children’s growth in developing world datasets
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Introduction This study aimed to use novel statistical techniques to explore the relationship between early weight gain and mortality within and between populations. Methods We have collated and reformatted three distinct developing world anthropometric datasets with frequent measurements in the first two years, from Malawi, Pakistan and South Africa. Each were set up for different purposes; the Pakistani set consisted of four different distinct socio-economic cohorts (middle class, urban slum, village and peri-urban slum), while both the African cohorts had significant rates of HIV.

Generalised Additive Models for Location Scale and Shape (GAMLSS) were used to model smooth median curves for each cohort. Children were identified as wasted (Z BMI <-2) or stunted (Z Height <-2) compared to the WHO 2006 standard. Results The cohorts showed very different median growth patterns over time, with children within the middle class Pakistani and South African cohorts growing at a faster rate than the other four. At 6 months, the prevalence of wasting varied from 1-9% between cohorts. Stunting rates varied from 9-52%, rising markedly with age in the Malawi cohort.

Death rates in the cohorts varied from 3-19%. Mapping the probability of children moving from one
state to another throughout time (12m-24m) revealed that in more affluent cohorts wasting was usually followed by recovery, while in the poorest cohorts it was associated with increased risk of mortality. Most stunted children were never wasted, but those with both were at highest risk of later mortality, with up to 57% dying subsequently. Conclusions Wasting appears to be a temporary state, but is associated with an increased risk of mortality, while most stunted children did not go through a wasted stage at all.

P-6 Predictors of Failure of Awake Regional Anesthesia for Neonatal Hernia Repair Data
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Awake regional anesthesia (RA) is a viable alternative to general anesthesia (GA) for infants undergoing lower abdominal surgery. Benefits include lower incidence of post-operative apnea and avoidance of anesthetic agents that may increase neuroapoptosis and worsen neurocognitive outcomes. The General Anesthesia compared to Spinal anesthesia (GAS) study compares neurodevelopmental outcomes following awake RA or GA in otherwise healthy infants. Our aim was to describe success and failure rates of RA in this study and report factors associated with failure. Methods: This was a nested cohort study within a prospective randomized, controlled, observer blind, equivalence trial. 722 infants ≤ 60 weeks postmenstrual age, scheduled for herniorrhaphy under anesthesia were randomly assigned to receive RA (spinal, caudal epidural or combined spinal caudal anesthetic) or GA with sevoflurane. The data of 339 infants, where spinal or combined spinal caudal anesthetic was attempted, was analyzed. Possible predictors of failure were assessed including: patient factors, technique, experience of site and anesthetist and type of local anesthetic. Of the 722 infants enrolled from 7 countries, 84 were recruited in the UK of which 52 were patients from RHSC Glasgow. Results: RA was sufficient for the completion of surgery in 83.2% of patients Spinal anesthesia was successful in 86.9% of cases and combined spinal caudal anesthetic in 76.1%. 34 patients required conversion to GA and a further 23(6.8%) required brief sedation. Bloody tap on the first attempt at lumbar puncture was the only risk factor significantly associated with block failure (OR= 2.46)

P-7 Apnea after awake-regional and general anesthesia in infants: The General Anesthesia Study
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Post-operative apnea is a complication in young infants. Awake-regional 4anesthesia (RA) may reduce the risk; however the evidence is weak. The General Anesthesia compared to Spinal anesthesia (GAS) study is a randomized, controlled, trial designed to assess the influence of general anesthesia (GA) on neurodevelopment. A secondary aim is to compare rates of apnea after anesthesia. Methods: Infants ≤ 60 weeks postmenstrual age scheduled for inguinal herniorrhaphy were randomized to RA or GA. Exclusion criteria included risk factors for adverse neurodevelopmental outcome and infants born < 26 weeks’ gestation. The primary outcome of this analysis was any observed apnea up to 12 hours post-operatively. Apnea assessment was unblinded. Results: 363 patients were assigned to RA and 359 to GA. Overall the incidence of apnea (0 to 12 hours) was similar between arms; 3% in RA and 4% in GA The incidence of early apnea (0 to 30 minutes) was lower in the RA arm; 1% versus 3% The incidence of late apnea (30 minutes to 12
hours) was 2% in both RA and GA arms. The strongest predictor of apnea was prematurity; 96% of infants with apnea were premature. Conclusions: RA in infants undergoing inguinal herniorrhaphy reduces apnea in the early post-operative period. Cardio-respiratory monitoring should be used for all ex-premature infants.

P-8 Draw-over is more accurate than push-over during manual ventilation with the Tri-Service Anaesthetics Apparatus

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BACKGROUND The Tri-Service Anaesthetics Apparatus is a simple anaesthetics system designed for resource-poor environments. Its low resistance makes it attractive for the paediatric population as it minimises work of breathing. It was originally conceived as a draw-over system (gas pulled through the vaporiser by the patient or a self-inflating bag) but is increasingly used in a push-over mode (gas pushed through the vaporiser by a self-inflating bag or ventilator). It has been recognised that the push-over configuration can lead to agent over-delivery, most likely due to reciprocating gas flow across the vaporiser. Changes to the inlet port of the usual self-inflating bag, the Laerdal Resuscitator, means that it is no longer possible to assemble the system in the draw-over mode. AIM This study attempted to modify the push-over system to improve its accuracy, particularly for environments without anaesthetic agent monitoring. METHODS The draw-over system was compared to a number of different push-over setups, each with different configurations of one-way valves added to reduce reciprocal gas movement. Agent delivery in each configuration was compared. RESULTS All push-over configurations over-delivered when compared with the draw-over setup. The push-over configuration that gave the most accurate performance had additional valves on both sides of the vaporiser. All systems with only one additional valve over-delivered agent. DISCUSSION Adding a one-way valve either side of the vaporiser created a push-over system that had similar accuracy to the draw-over system. However, it was felt that the resultant increase in resistance would make it unsuitable for the paediatric population, hence its use cannot be recommended.

P-9 Calculating Body Surface Area in Turner’s Syndrome: which formula to use?

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Background Body surface area (BSA) is used clinically to calculate both risk of catastrophic aortic dissection in Turner’s syndrome patients. There are currently multiple formulae for calculating BSA without consensus on a preferred method. We assess the clinical validity of each formulae as well as providing analysis of change in BSA with age. Method Height and weight for every clinic visit for 114 patients with Turner’s syndrome from 1970-2013 in the Greater Glasgow area was taken and the BSA calculated using Dubois, Haycock, Mostellar and Furqan formulae. The mean of all four equations was used as gold standard and the error from this for each individual formula calculated to determine covariance. The relationship between BSA and age groups 8, 10, 12, 14 and 16 was explored using descriptive statistics, scatter plot and ANOVA. Results All formulae were highly agreeable with Mosteller (mean error -0.007, 96% CI -0.021 - 0.007), and Haycock (mean error 0.001, 96% CI -0.014 - 0.016) having all calculations accurate to within 5%. Dubios (mean error -0.022, 96% CI -0.072 - 0.028) and Furqan (mean error 0.028, 96% CI -0.028 - 0.084) were slightly less accurate but the error remained clinically insignificant. BSA increased with age in a non-linear fashion. BSA
increase 8-10, 0.158 (95% CI 0.024); 10-12, 0.198 (95% CI 0.019); 12-14, 0.202 (95% CI 0.020); 14-16, 0.128 (95% CI 0.017) - ANOVA p<0.0000. Conclusion Mostellar and Haycock formulae were accurate to within 5% for age and extremes of height/weight in Turner's patients, and therefore we recommend using either to calculate growth hormone dose or ASI. Dubois and Furqan are less accurate and should be used with caution. The non-linear relationship between developmental stage and BSA highlights the need for caution when interpreting ASI in the developing patient.

P-10 Measurement of the corrected QT interval during pregnancy and the post-partum period
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Background: Little is known about the characteristics of the 12-lead electrocardiogram (ECG) during pregnancy. The QT interval is of significance as QT prolongation can predispose to sudden cardiac death and its measurement is particularly relevant in women with conditions such as congenital long QT syndrome. However, it is not known which method of QT interval correction is best during pregnancy and the post-partum period. Aims: We aimed to compare four methods of QT interval correction (Bazett, Fridericia, Framingham and Hodges) at three different time points (2nd trimester, 3rd trimester and post-partum period) to determine the extent of differences between them.

Methods: Resting 12-lead ECGs were available from 2nd trimester, 3rd trimester and post-partum time points in women from the Proteomics in Pre-eclampsia (PIP) study. QT interval was measured manually in every ECG by two readers whose longest QT interval from 3-5 cardiac cycles in leads II, V2 and V5 was used to calculate an average QT for each ECG.

Results: ECGs were available in 73 women with mean age at booking appointment 33±5 yrs. Mean gestation was 16.6±1.7 weeks at 2nd trimester ECG and 28.7±1.5 weeks at 3rd trimester ECG. The post-partum ECG occurred at 7.5±1.8 months. Heart rate (HR) in beats per minute (bpm) was significantly different between time points, from 74±10bpm, and 81±11bpm in the 2nd and 3rd trimesters respectively to 65±8bpm post-partum (p<0.0001). Bazett QTc was statistically significantly different across time points (420±21ms, 429±22ms and 409±21ms, p<0.0001). However, Fridericia (406±17ms, 409±18ms and 404±18ms, p=0.190), Framingham (407±16ms, 409±16ms and 405±17ms, p=0.155) and Hodges (405±16ms, 408±17ms and 404±17, p=0.151) were not different.

Conclusions: QTc, as corrected by Fridericia, Framingham and Hodges methods, was similar between time points. In contrast the Bazett method led to significantly different results and should not be used for QTc correction in pregnancy.

P-11 Investigation into Survival Mechanisms of Malignant B cells in the Central Nervous System
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Background: Acute lymphoblastic leukaemia (ALL) is the commonest childhood cancer. Despite therapeutic advances 10% of children with ALL relapse or die on treatment and >50% could achieve cure with less intensive chemotherapy. The current focus of ALL research is to develop novel therapies for those destined to relapse, but reduce treatment burden for good risk patients. Central nervous system (CNS) involvement with ALL has particular interest: CNS-directed therapy causes significant side-effects, isolated CNS relapse is not predictable by risk-stratification, and the CNS is involved in >50% of relapses. Hypothesis and aims: Based on the nutritional paucity of the cerebrospinal fluid (CSF) compartment it is hypothesised that the metabolome of ALL cells differs between CNS and bone marrow (BM) compartments and that identification of metabolic changes
may enable rational drug design and/or development of sensitive biomarkers to track CNS disease. Methods: Using in vitro co-culture of leukemic cells with meningeal and BM stroma and a xenograft model of human leukemic engraftment in immunodeficient mice, adaptations of leukemic cells to BM and CNS niches are being investigated using RNAseq and metabolomics. CSF from children with ALL will be used to validate findings and investigate soluble biomarkers. Results: ALL cells have a proliferation and survival advantage in co-culture with CNS (meningeal) but not BM stroma. CNS and BM stroma alter the metabolomic profile of surrounding media. Metabolite levels in CSF from children with ALL are stable, and there are metabolomic changes in the CSF of children with ALL.

P-12 Micronutrient Status of Children with PKU

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Abstract Background: Phenylketonuria (PKU) diet is protein-restricted, and therefore daily micronutrient-enriched amino acid supplements are prescribed to patients with PKU. Hence people with PKU are at risk of micronutrient deficiencies. Objectives: To evaluate the micronutrient status of children with PKU and to investigate its correlation with metabolic control. Methods: This was a retrospective analysis of clinical data obtained from PKU children (≤16 years) attending metabolic medicine clinic at the Glasgow Royal Hospital for Sick Children between 1990 to 2013. The study included 81 patients who provided a total of 512 blood samples for their routine annual micronutrient screening. Results: Status of vitamin B12, E, and serum and erythrocyte folate measurements were above laboratory reference ranges (RR) in 27%, 54%, 46% and 35% of the blood samples, respectively. However, 44% of selenium and 14% of zinc measurements were below the RR. Low selenium status was significantly associated (p <0.001) with poor metabolic control. In addition, regardless of metabolic control status, there was a considerable number of vitamin E, B12 and folate measurements above RR in blood samples with low selenium status. Conclusion: Selenium deficiency is common in PKU patients. These results suggest also that low selenium status of PKU children is related not only poor dietary compliance to PKU micronutrient-enriched amino acid supplements but also low selenium bioavailability from these supplements.

P-13 Can blood culture stickers act as a quality improvement tool for good antiseptic technique and case note documentation during blood culture sampling?

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Background: Neonatal sepsis is the third leading cause of neonatal mortality. Accurate diagnosis of early or late-onset sepsis is challenging and relies on positive blood cultures as a gold standard. Good antiseptic technique during culture sampling is crucial to reducing contaminated growth. Aims: - To see if the use of blood culture stickers improve documentation of the antiseptic technique used during blood culture sampling. - To see if improved awareness of optimal antiseptic technique reduces the rate of contaminated growth. Methods: This study included all neonates who had blood cultures taken in a tertiary neonatal unit during a two month period before, and one month after the introduction of the blood culture stickers (November 2014). Medical staff were required to complete the sticker immediately after sampling. Documented information included age, skin and culture
bottle cleaning technique, the clinical features of sepsis present and if a central line was in-situ.
Blood cultures were identified retrospectively from microbiology records. The pre-sticker and post-
sticker periods saw 118 cultures (102 patients) and 81 blood cultures (63 patients) respectively. One
patient (1 culture) and 10 patients (10 cultures) were excluded respectively due to unavailability of
case-notes. Data were collected from case-notes and computerised clinical databases. P-values were
calculated using Chi-sq and Fisher's Exact Test. Results: There was significant improvement in
documentation of blood culture sampling technique (P=0.02) in case-notes, although not on
computerised database notes. There was no change noted in the rate of contaminated blood
cultures between the pre- and post-sticker groups (0.84% and 1.29% respectively). There was no
significant difference noted in early-onset, late-onset or overall rate of infection. Conclusion: Blood
culture stickers are a useful tool for improving the quality of documentation and are useful prompts
for reinforcing good antiseptic technique. In our study, it was not associated with reducing
contaminated samples.

P-14 Printing Oral Dosage Forms - Manufacture of Personalised Medicine using Fused Filament
Fabrication
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Background Human beings are an extremely diverse species with many different factors that can
influence the behaviour of a drug within the body. Children are a perfect example of such variety.
Doses are often prescribed based on body weight, and can vary greatly from infants to adolescents.
With current 'traditional' manufacture of oral dose pharmaceuticals, generally only a limited number
of doses are produced, leading to difficulties with appropriate dosing for the patient. The ability to
manufacture personalised doses for these patients would be of great benefit both practically and
financially, and may even lead to 'point of care' manufacture. Aims/Objectives The aim of this piece
of work was to carry out initial feasibility studies on a 3D printing method for the production of
personalised oral dose medication. Fused Filament Fabrication (FFF) is an emerging technique which
has gained increased interest in recent years. For pharmaceutical manufacture, two possible routes
are available - loading of drug prior to filament fabrication (via hot-melt extrusion) or loading of drug
by submerging a suitable filament in a solution containing the selected drug. Each of these methods
results in a drug loaded filament which can then be printed using a 3D printer. Methods Experiments
were carried out, using the latter technique above, by submersing a poly(vinyl alcohol) (PVA)
filament in an ethanolic solution of the chosen drug. Atomic force microscopy (AFM) was used to
determine the distribution of drug within the polymer and high performance liquid chromatography
was used to determine the drug loading achieved in the filament. Results and Conclusions Although
drug loading was low, these initial experiments provide an opening into the production of
personalised medicines. Further work is now needed to investigate how this filament behaves in the
3D printer, and the range of doses which can be printed.
P-15 Clinical characteristics and outcomes for males with PAIS: an i-DSD Registry study

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Background: Partial Androgen Insensitivity Syndrome (PAIS) affects 1 in 20,000 male infants and is associated with a variable phenotype. Androgen receptor (AR) gene mutations are found in 20% of these patients. To date there is limited published data regarding the outcomes for male adolescents with this condition. Objectives: The aims of this study were to determine the outcomes and clinical characteristics for 46,XY males with PAIS, using information from the International DSD (I-DSD) Registry, in collaboration with centres internationally which use the I-DSD Registry. Methods: The I-DSD Registry was used to identify all males registered as having PAIS. Each of the centres who registered the patients was then contacted to obtain information regarding the clinical characteristics of these patients. Results: 48 men from 9 centres internationally met the inclusion criteria for this study. Most commonly they presented in the neonatal period (43%). Twenty eight (58%) of the men had an AR mutation, with 19 different mutations reported. AR –ve men were more likely to present at a younger age (p=0.01). Median external masculinisation score (EMS) at time of diagnosis was 8 (range 2-12). Median EMS at time of most recent presentation was 9 (range 3-12). Twenty two men (46%) received testosterone therapy at some point with variable regimens used. Thirty one (65%) men required at least one surgical procedure, with AR +ve men being more likely to require multiple surgeries for hypospadias repair (p=0.02). All AR +ve men had gynaecomastia at time of most recent presentation compared to 10% of those who were AR â€“ve (p<0.0001). Five men, 4 of whom had AR mutations, required mastectomy for severe gynaecomastia. Conclusions: The I-DSD Registry offers the opportunity for collaborative research internationally regarding conditions such as PAIS. Further information regarding outcomes for patients with PAIS will aid future management of such individuals.

P-16 Trends Of Use Of Bisphosphonates In Children With Secondary Osteoporosis

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Background: There is still limited evidence based for the use of bisphosphonates (BP) in children with secondary osteoporosis.


Methods: Data were gathered from a combination of a clinical and pharmacy database. Results reported as median (range)

Results: A total of 37 children (20 M) commenced on bisphosphonates treatment over the 12-year period, median age 11.3 years (3.1-18.4).
DXA prior to start of BP was available for 32 (86%) children. Of the 5 without DXA, 5/5 (100%) had significant disability with difficulties lying still for a scan (4 cerebral palsy and 1 Infantile Batten’s).

Fractures prior to treatment were: multiple vertebral fracture 13/37 (35%), repeated appendicular fractures 14/37 (38%) and 10/37 (27%) single appendicular fracture. Nine out of 13 (69%) of those with vertebral fractures had repeat spine x-rays during treatment. None of them showed vertebral reconstitution. Median lumbar spine bone mineral content Z score adjusted for bone area increased from -1.2 (-3.2, -0.4) at baseline to -0.4 (-1.1, 1.9) at 12 months \( p= 0.01 \).

Conclusion: This is the first audit of the use of bisphosphonates in childhood secondary osteoporosis and shows:

(1) The number of children commenced on bisphosphonates therapy is increasing over the last 12 years.
(2) Challenges in monitoring children with significant disability
(3) Despite improvement in DXA bone mineral content, vertebral reconstitution was not seen in those with vertebral fractures.

P-17 Leptin replacement improves central ventilation in a patient with congenital leptin deficiency: first report in childhood.

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Background: Congenital leptin deficiency(CLD) is characterized by severe early-onset obesity due to hyperphagia and impaired satiety. The impact of obesity in obstructive sleep apnoea hypopnoea syndrome(OSAHS) was originally reported as mechanical, but recent data suggest that adipokines may influence central ventilation. We highlight that treatment with recombinant human leptin(RHL) in CLD with OSAHS improves ventilation before weight loss. Case Presentation: A 10 months old female of Pakistani origin was severely obese (weight:17.85Kg(+5.55SDS), BMI:29.35 Kg/m²(+5.25SDS)). Born at term to consanguineous parents. Mother reported rapid weight gain during first months of life, due to intense hyperphagia with food-seeking behavior. Family history showed a first cousin with CLD: genetic analysis confirmed the same homozygous leptin mutation. RHL replacement was started with good reduction of appetite. Oxicapnography was performed before starting treatment, showing normal mean saturations and CO2 but clusters of deep desaturations (Desaturation index(DI) 19.8/hr of \( \geq 4\% \)). After 50 days of treatment polysomnography was performed showing a significant improvement in clusters of desaturation(DI 9.3/hr) and a mixed pattern of both obstructive and central events with an apnoea hypopnoea index(AHI)13.7/hr. At this stage the weight was stable at 26.9 Kg(+6.7SDS), BMI was 34.8
Kg/m²(+6.6SDS). After 11 months of treatment a significant loss of weight was seen (weight:19.62 Kg(+3.05 SDS), BMI:25.5 Kg/m²(+4.5SDS). Repeat polysomnography showed marked improvement with a DI 4.2/hr. Conclusion: To the best of our knowledge, this is the first report showing an improvement in ventilation, in a patient with CLD following treatment with RHL before significant weight loss. In mice, leptin microinjections into specific brain areas, are associated with increased pulmonary ventilation and enhanced bioelectrical activity of inspiratory muscles, suggesting that leptin may influence ventilation through direct effect on respiratory control centres. Leptin may have central effects on ventilatory regulation, which need to be explored further.

P-18 The measurement of urinary gonadotrophins for assessment and management of pubertal disorders
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Objective: Prospective evaluation of the relationship between first morning urinary gonadotrophins (uGn) measured by immunoassay and corrected for creatinine (uLH:uCr; uFSH:uCr), and basal serum gonadotropins (sLH, sFSH) and in response to LHRH stimulation test. Prospective evaluation of uGn trend in patients receiving GnRH analogue (GnRH-a)(Decapeptyl SR, 11.25 mg, every 10-12 weeks).

Methods: Enrolled 16 (13M) patients evaluated for delayed puberty, 15(1M) for suspected precocious puberty and 17 (3M) on GnRH-a. Three first morning urine samples of 3 mornings before the stimulation test or before the GnRH-a injection were collected. For patients on treatment, 3 samples 5/6 weeks after injections were also collected. Data were expressed as median (range), and analyzed by SPSSv10.0 (p <0.05). Results: Coefficient of variation (CoV) of samples collected before the stimulation test was 0.27 (0-1.4) for uLH:uCr and 0.25 (0.05-0.99) for uFSH:uCr. Significant correlations between sLH and uLH:uCr (r = 0.7;p <0.001) and between sFSH and uFSH:uCr (r = 0.9;p &lt;0.001) were identified. Based on receiver operator characteristics analysis, a uLH:uCr value of 0.032 IU/mmol as a cut-off would detect a sLH peak >5 UI/L (sensitivity: 87%; specificity: 86%; Area under the curve: 0.9). For patients on treatment, uLH:UCr CoV of samples collected before the injection was 0.29 (0.14-0.85) and after 5/6 weeks 0.33(0.04-0.63), while for uFSH:UCr, respectively, 0.24 (0.13-0.52) and 0.4 (0.08-1.3). Median uLH:UCr and uFSH:UCr values before injections (0.01 IU/mmol; 0.34 IU/mmol) as a cut-off would detect a sLH peak >5 UI/L (sensitivity: 87%; specificity: 86%; Area under the curve: 0.9). For patients on treatment, uLH:UCr CoV of samples collected before the injection was 0.29 (0.14-0.85) and after 5/6 weeks 0.33(0.04-0.63), while for uFSH:UCr, respectively, 0.24 (0.13-0.52) and 0.4 (0.08-1.3). Median uLH:UCr and uFSH:UCr values before injections (0.01 IU/mmol; 0.34 IU/mmol) were significantly higher than after 5/6 weeks (0.008 IU/mmol; 0.09 IU/mmol) (p: 0.000 and p: 0.000,respectively). Conclusion: UGn is a useful, non-invasive instrument for diagnosis and management of pubertal disorders.

P-19 Paediatric adrenal weights at post-mortem in the West of Scotland between 2007-2012
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Background: Adrenal weight is measured as part of the standard paediatric post-mortem protocol to help identify pathology. Age and body weight independently affect adrenal weight and standard weight tables according to these factors are available in textbooks. Such tables only include the first
year of life, are based on dated studies and may not provide information relevant to the population of post-mortems carried out in modern day practice. Aim: Our aim was to tabulate contemporary adrenal weight data by age and body weight in a single centre over the past 6 years. Methods: We retrospectively analysed all West of Scotland procurator fiscal-authorised post-mortem reports (2007-2012). Cases with evidence of significant adrenal abnormality were excluded. We created a table of the mean and standard deviation of combined adrenal weight (g) and adrenal weight as a percentage of total body weight (%TBW) at twelve age intervals from 0 to 5 years based on the stages of adrenal gland development. Results: Of 281 cases during the study period, 205 cases were included. There was no correlation between time to post-mortem and adrenal weight (p = 0.167). Adrenal weights decreased over the first three months of life and then increased with age whilst %TBW decreased continually from birth. Combined adrenal weight showed a weak positive correlation with age (r = 0.148, p = 0.035) but did not correlate with body weight (p = 0.107) %TBW correlated negatively with age (r = -0.468; p<0.001). Conclusions: We tabulated adrenal weights in the first 5 years of life and demonstrated a fluctuation in adrenal weight with age and body weight as expected due to the physiological development of the adrenal gland. Our findings suggest that expressing adrenal weight as a percentage of total body weight may be helpful for interpretation, particularly after the first year of life.

P-20 Metabolic profiles and glucose homeostasis in children and adolescents with childhood-onset growth hormone deficiency at time of diagnosis and final height
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Background: It is well known that growth hormone (GH) brings about several effects, involving bone, body composition, lipid and glucose homeostasis. However, the complex interplay between these parameters is rather poorly studied in children with childhood-onset-GH deficiency (CO-GHD). Aim: To investigate lipids, adipokines (leptin- adiponectin- resistin) and glucose homeostasis and their relationship with bone and body composition in children and adolescents with CO-GHD at time of diagnosis and retesting at final height. Study population and method: A cross-sectional study of children undergoing GH stimulation tests for short stature (total -25, GH deficiency -15, median age (range) 10.9years (5.6-16.0)) and biochemical revaluation at final height after GH therapy (total- 11, GH deficiency -7, age 16.7years (14.9-18.6)). Results: At time of diagnosis and retesting, lipid profiles, adipokines and glucose homeostasis in both groups were within the normal range with no differences between those with GH deficiency and those who had normal GH levels. Leptin levels in both groups correlate positively with fat mass (r=0.9, p<0.001), and with osteocalcin positively at diagnosis (r=0.5,p=0.01) but inversely at retesting (r=-0.9,p<0.001). In retesting group, those who were older at the time of diagnosis CO-GHD and had a shorter duration of GH therapy were more likely to have higher cholesterol(r=0.9, p<0.001), LDL(r=0.9, p<0.001), and leptin (r=0.8, p<0.001), and lower osteocalcin (r=-0.7, p=0.01) at final height. In conclusion: Metabolic profiles and glucose homeostasis are not significantly different between those with GH deficiency and those with normal GH levels at time of diagnosis and retesting at final height. Timing and duration of childhood treatment may influence adiposity parameters and bone formation biomarkers seen in adolescents with CO-GHD. Differences in relationship between leptin and osteocalcin at diagnosis and retesting may be related to active growth. Further studies are still required to clarify the relationship between adipocytokines, bone and CO-GHD.
P-21 Persistence Of Musculoskeletal Abnormalities In Children And Adolescents With Inflammatory Bowel Disease: A Prospective Longitudinal Study

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Background: Childhood onset inflammatory bowel disease (IBD) is associated with poor bone health, but long term changes in volumetric density and geometry is unclear. Aim: To evaluate musculoskeletal development using peripheral quantitative computed tomography (pQCT) in childhood-onset IBD. Methods: Prospective longitudinal study of pQCT at radial site with 12 months follow-up in 43 children and adolescents (23 males) with IBD: 30 Crohn's Disease (CD), 13 Ulcerative Colitis (UC) and Inflammatory Bowel Disease Unclassified (IBDU). Results reported as median (range).

Results: In CD [median age 13.8 years (10.4, 16.50)], 20% and 3% were prepubertal at baseline and follow-up. 80% and 63% had no active disease at baseline and follow-up. CD patients had significantly lower trabecular bone mineral density (TrbBMD) -0.9(-3.9,1.4) and cortical bone mineral density (CrtBMD) -1.2(-5.2,2.0) compared to zero at baseline. Only CrtBMD showed improvement at 12-months (p=0.046). For bone geometry in CD patients, periosteal circumference (PeriC) -1.1(-2.8,1.9) was significantly lower at baseline and endosteal circumference (EndoC) was significantly higher 2.8(0.9,5.0), indicating thinner bones. No changes in EndoC or PeriC were seen at follow-up in CD patients. In UC/IBDU [median age 13.2 years (9.8,15.8)], 23% and 15% were prepubertal at baseline and follow-up. 77% had no active disease both at baseline and follow-up. In UC/IBDU patients, all pQCT bone parameters did not change during follow-up. Baseline IGF1:IGFBP3, a surrogate marker of free IGF-1, was associated with change in total BMD in the whole group(r=0.42, p=0.02). Conclusions: Despite relatively mild disease and pubertal progression, children with IBD, particularly those with CD, have persistent abnormal BMD and bone geometry. We describe the association of change in total BMD and surrogate marker of free IGF1 for the first time suggesting that functional abnormalities in the GH-IGF axis may contribute in part to this abnormal bone development. (289 words)

P-22 Membranoproliferative glomerulonephritis in childhood: a 30 year experience

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Background: Membranoproliferative glomerulonephritis (MPGN) in childhood is a rare condition. Published data regarding prognostic factors, long-term outcome and treatment strategies is sparse. Aim: We report our 30 years experience of patients â‰¤16 years with a diagnosis of MPGN presenting between January 1985 and December 2015. Method: Data from 1985 to 2015 detailing presenting features, immunological findings and long-term outcome was collected from an electronic renal database. Results: 42 patients presented within the study period: 18 male. Median age at presentation: 10.7 years (3.8 - 16.3 years). Median follow-up: 4.4 years (0.5- 29.4 years).

Histological type: MPGN I - 23; MPGN II/Dense Deposit Disease (DDD) - 18; and 1 MPGN III - 1.

Clinical features at presentation: 85% - haematuria; 59% - hypertensive; 53% nephrotic. Mean creatinine: 66.5µmol/L (28-357). In the 24 with complement levels available from presentation: 21 (87%) low C3; 12 (50%) low C4. Further immunological and genetic measures of complement dysregulation are presented. Treatment included prednisolone in 32 (76%) patients; azathioprine- 4; ciclosporin - 4; tacrolimus - 5; mycophenolate mofetil - 13. 4 underwent plasma exchange; 1 FFP.
infusions; 3 received rituximab infusions and two eculizumab. 36/42 (86%) patients received treatment with an angiotensin converting enzyme inhibitor. 11 (26%) patients progressed to end stage renal disease (ESRD). 6 patients were transplanted. 3 were re-transplanted: 2 MPGN II/DDD, 1 MPGN I. 6/23 (26.1%) patients with MPGN I and 5/18 (27.8%) with MPGN II/DDD developed ESRD. Current CKD stages by eGFR in the 31 with renal survival are CKD 1: 19; CKD 2: 7; CKD 3: 3; CKD 4: 2. Mortality is 4.7% (1 ESRD and 1 transplant patient). Discussion: Long term clinical follow up using renal registries and local renal databases remains important in tracking how prognostic factors, including immunological and genetic markers, guide treatment selection and modify disease outcomes.

P-23 Pubertal Development in Individuals with Partial Androgen Insensitivity Syndrome (PAIS) Phenotype Assigned Female Sex of Rearing

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Background Data on long-term outcomes of girls with partial androgen insensitivity syndrome (PAIS) are scanty with no prospective studies detailing pubertal development. To begin to address this knowledge gap, the aim of this study was to evaluate pubertal development in patients with partial AIS (PAIS) assigned female sex of rearing. Objective To analyse the puberty development in patients with PAIS diagnosis and with female sex of rearing. Subjects and Methods A cohort of individuals with the following criteria was identified through the International Disorders of Sex Development Registry (www.i-dsd.org): 46,XY karyotype; female sex assignment; disorder of androgen action; PAIS; puberty data available; over the age of 16yrs. The search identified 20 girls from 10 centers in 6 countries; all center leaders were invited to participate in the study. This preliminary report of our ongoing study provides descriptive summaries of data from 9 of 20 cases for whom data have been provided. Results It is notable that EMS was ≥ 6 for 5 girls, likely reflecting the prevailing practice of female sex of rearing in most cases of partial AIS in the 1990s. Age at onset of puberty was within the range of normal for all patients. Two girls without proven AR mutations and with intact testes underwent masculinizing changes at puberty. Another two girls with proven AR mutations and with intact testes underwent femalinizing changes at puberty. Discussion Additional data from PAIS girls and women with proven AR mutations, particularly those with testes retained through puberty, are needed to draw firm conclusions regarding pubertal development in girls with PAIS.
P-24 Assessment of injuries under 1 within a paediatric emergency department
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Background Healthcare professionals working with children have a duty of care to recognise and act on suspicions of child abuse. Children under 1 are non verbal making them more vulnerable than children who can communicate. Good communication between healthcare professionals is key to good medical practice.

Aims
● To review our assessment of infants presenting with an injury under 1 year of age.
● To review how effective communication is between the paediatric emergency staff and health visitors.
● To ascertain the number of children who represent 3 months, 6 months and 12 months following injury.

Methods
This was a retrospective audit reviewing case notes of all infants who presented to the emergency department with an injury during the month of August 2014.

Results
60 patient emergency department cards were reviewed with a median age of 6 months. 70% of infants had the correct injury <1 proforma used. We were successful in contacting 42/60 health visitors. Of the 42 health visitors contacted 66.6% had not received any communication from emergency department staff regarding injury. 1.6% of the patients represented by 3 months from first attendance with a further injury. 13.3% of the patients represented by 6 months from first attendance with a further injury. Median age at re-attendance was 15.3 months.

Discussion
Although 13.3% (median age 15.3 months) of children re-attended with an injury by 6 months following initial presentation all injuries were considered to be minor. One child that re-presented had a shared child protection/social work referral completed. No child protection concerns found on review. Communication between emergency department staff and health visitors was inadequate during the audit time period. More effective communication is necessary between health visitors and the emergency department staff.

P-25 Risk Stratification of Tricuspid Atresia to Guide Long Term Prognosis
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Background Tricuspid atresia is defined as the absence of a right atrio-ventricular connection with a dominant left ventricle, resulting in a univentricular circulation. Tricuspid atresia can occur in isolation or in association with other congenital cardiac abnormalities, for example: aortic arch anomalies; transposition of the great arteries; varying degrees of right ventricular hypoplasia; pulmonary stenosis and pulmonary atresia. The presence or absence of associated anomalies influences the initial and subsequent surgical options.

Aims
To report the number of patients diagnosed with tricuspid atresia and associated cardiac lesions and define their initial surgical management. In addition assess whether the presence or absence of such lesions alters the long term prognosis.

Methods
Retrospective review of consecutive cases of tricuspid atresia diagnosed in our tertiary congenital cardiac centre between 1st January 2000 and 31st December 2014.

Results
41 cases of tricuspid atresia were diagnosed during the study period. 16 required a modified Blalock Taussig (BT) shunt in the neonatal period due to severe right ventricular hypoplasia, pulmonary stenosis or atresia. 10 required a pulmonary artery band due to increased pulmonary blood flow and 13 required no surgical intervention before the Glenn procedure (superior vena cava redirection to the pulmonary artery) in the first year of life.

Conclusions
The presence of associated cardiac lesions allows paediatric and fetal cardiologists to risk stratify tricuspid atresia at diagnosis, predicting the initial surgical pathways and ultimately provide parents with a more accurate long term outlook.
P-26 UPBEAT TEMPO STUDY: Uk Better Eating and Activity Trial- The Effects of Maternal Obesity on Paediatric Obesity

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BACKGROUND: Several recent studies have provided evidence for maternal obesity and excessive pregnancy weight gain to independently increase the risk of later obesity for both the mother and the child (Beverlein, 2012; Laitinen, 2012; Rode, 2012). There is increasing evidence to suggest longer-term influences on the developing child, with several epidemiological studies reporting independent associations between maternal BMI and childhood adiposity. Recent trials with small numbers of subjects showed that the effect of an antenatal dietary intervention for overweight and obese women on short term maternal and infant health outcomes remains unclear, as does the effect on childhood obesity. AIM: The aim of this study is to investigate the association between maternal obesity during pregnancy and childhood adiposity (3-year old children), and to determine the influence of a lifestyle intervention in obese pregnant women. OBJECTIVES: Primary Objective: To determine whether an intervention in obese women designed to reduce the incidence of GDM and of LGA delivery is associated with reduced adiposity in the child (age 3 years). METHODS: The UPBEAT TEMPO will follow-up UPBEAT mothers and their 3-year old children to address the relationship between maternal obesity and offspring adiposity (3-year old children), and to determine the hypothesis for the UPBEAT TEMPO study is to determine whether an intervention in obese women designed to reduce the incidence of GDM and LGA delivery is associated with reduced adiposity in the child. Mother and child will have anthropometric measurements, nutrition and activity questionnaires, Mothers will have behavioural and psychological measures assessed. The child will have development assessed using the Ages and Stages tool. Blood and urine is collected for mothers while children will have saliva and heel prick blood spots obtained with consent. RESULTS: To be determined as study ongoing at present. Results of UPBEAT published. CONCLUSION: To be determined when study completed PI: Professor Scott Nelson.

P-27 Scottish Children’s Research Network: organisational

Elizabeth Waxman
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Scottish Children Research Network

The Scottish Children’s Research Network, funded by the CSO was set up to provide the infrastructure to support paediatric clinical trials in the Scottish healthcare system. ScotCRN provides nursing and clinical sessions in each of the four children’s hospitals and support in the feasibility, set up and management of medicinal and non medicinal trials. In order to increase the safety, efficacy and availability of medicines, carefully managed and regulated clinical trials are required in the appropriate age groups. Well designed trials are also required where current practice guidelines are not evidence based. The local infrastructure and expertise of the clinical research facilities (CRF) combined with national infrastructure of ScotCRN, provides a platform on which to support the management and recruitment to single-site and multi-site paediatric trials across all health boards in Scotland.