

SCD and can occur with both infection (bacterial and viral,) and sickle cell crises. This study aimed to look at the incidence of bacteraemia and bacterial infections in children with SCD presenting to a North-East London district hospital with a fever of 38.5 degrees or higher.

**Methods** A retrospective analysis was performed on all children (aged under 16 years,) with SCD presenting with a fever of 38.5°C or higher over a 1-year period. Data was collected for each febrile episode on age of child, type of SCD, final clinical diagnosis, initial White cell count (WCC) and C-reactive protein (CRP) levels, blood culture and microbiology results, length of stay and clinical outcome. Children were divided into those having a definite bacterial infection, suspected bacterial infection (clinically suspected but no microbiological confirmation,) or no bacterial infection. Definite bacterial infection was defined as bacteraemia (the isolation of a non-contaminant bacterial from the blood culture,) or other bacterial infection with positive microbiological confirmation.

**Results** Over the 1-year period there were 88 episodes analysed in 59 children. Definite bacterial infection occurred in 8% of febrile episodes of which 3.4% had bacteraemia. (*Streptococcus pneumoniae*, *Salmonella hartford*, *Salmonella typhirium*.) Suspected bacterial infection occurred in a further 33% of episodes. In 59% of episodes the final diagnosis was either a sickle cell crisis or viral illness (no bacterial infection.) Diagnosis did not vary significantly by haemoglobinopathy. One death occurred from *Salmonella typhirium* septicaemia. Average length of stay varied from 3.6 days in the group with no bacterial infection to 8.9 days in the group with definite bacterial infection.

**Conclusion** Bacterial infections continue to be a significant problem in children with sickle cell disease. *Salmonella* infection is a growing concern in this group of children. Further work is required to identify risk factors and predictors for bacterial infection, and ascertain optimal prevention and management strategies.

### G186(P) AN AUDIT OF MANAGEMENT OF PAIN CRISES IN CHILDREN WITH SICKLE CELL DISEASE

doi:10.1136/archdischild-2013-304107.198

N J Boyd. *School of Medicine, University of Glasgow, Glasgow, UK*

**Aims** Sickle cell disease (SCD) is a lifelong haematological disorder resulting in anaemia and pain crisis. Specialist centres use experienced staff and accredited protocols to manage pain crises in affected children. The main objective of this audit is to identify areas of management of crises which could be improved in line with recommendations set out locally, by the 'Painful Sickle Cell Crisis Protocol' and nationally, by the NHS Sickle Cell disease in Childhood Standards and Guidelines for Clinical Care. This may provide useful insight for service improvement and evidence for similar units throughout the UK and Europe. Of particular interest was timing and efficacy of administration of analgesia.

**Methods** Baseline audit of management of patients presenting to Accident & Emergency (A&E) or the hospital's haematology day unit (DU) due to acute pain crisis of SCD was conducted. The study cohort was all patients seen at the hospital with a diagnosis of SCD from 1st January 2010 to 31st December 2011. 43 patients met this criteria. Re-audit to be done January 2014.

**Results** Of the 43 patients registered with the hospital haematology unit, 12 attended the hospital because of pain crises, whilst 31 had no pain crises within the allotted time frame. 5 patients experienced more than one acute pain crisis. Time to administer initial analgesia was  $57 \pm 37$  minutes. Average length of stay in hospital was  $4.5 \pm 3$  days. The most common initial analgesic administered was oral or IV morphine. 14 of the 25 children had tried medication at home prior to presenting.

**Conclusions** Aspects of the service identified for improvement include: clear documentation of time patient presents, time they are

seen by a doctor and time they are given their first analgesia; unequivocal inclusion of a drug kardex in patients notes and consistent use of a pain scoring system.

**Recommendations** Implementation of a 'Sickle Cell Pain Crisis Assessment and Management' form. This would improve consistency of documentation of information relating to pain crises and therefore accuracy of future service monitoring.

### G187(P) CAUSES OF SEVERE ANAEMIA (HB <5 G/DL) IN CHILDREN (<18 YEARS) BETWEEN 2006 AND 2009

doi:10.1136/archdischild-2013-304107.199

<sup>1</sup>R Sidhu, <sup>2</sup>K McLean, <sup>2</sup>C Halsey, <sup>2</sup>B Gibson, <sup>2</sup>E Chalmers, <sup>2</sup>N Heaney. <sup>1</sup>*University of Glasgow, Glasgow, UK;* <sup>2</sup>*Department of Haematology, Royal Hospital for Sick Children, Glasgow, UK*

Severe childhood anaemia risks significant morbidity and mortality though may have different benign or malignant aetiologies. We set out to define the characteristics of this group of patients at our institution.

This study was performed in a large paediatric teaching hospital. We retrospectively identified children (<18y) presenting with Hb <5g/dL in the period 2006–9 by use of computerised laboratory records. Case notes were then reviewed and we recorded patient characteristics, final diagnosis and management with 2y of follow-up.

93 patients fitted study criteria. Patients were mean age 5y, (range 1d-17y). Diagnoses were: 33/93 leukaemia (25/33 acute lymphoblastic, 7/33 acute myeloid, 1/33 juvenile myelomonocytic leukaemia); 23/93 iron deficiency anaemia (IDA); 12/93 hereditary blood disorders (including 7/12 hereditary spherocytosis with 6/12 associated parvovirus); 25/93 "other" including 6/25 haemolytic-uraemic syndrome and 3/25 transient erythroblastopaenia. Of leukaemia 5/33 had presenting white cell count > 100x10<sup>9</sup>/L, and all received red-cell transfusion. Of IDA 19/23 had nutritional IDA (nIDA). 17/19 nIDA were aged <3y. 11/17 nIDA were of Pakistani origin (versus 3.5% of city population). Linking residential postcode with national index of multiple deprivation, 11/17 nIDA lived in the most (lowest 20%) deprived areas, rising to 9/11 in more severe nIDA (Hb <4g/dL). In IDA, all were prescribed iron supplementation, 21/23 feeding practises reviewed by dietician and 17/23 were transfused red-cells (all those with Hb <4g/dL). 9/23 IDA resolved within 1y though 3/23 had no repeat Hb recorded. Of all patients 11/93 died: 3/11 at initial presentation, 6/11 within 1y and 2/11 within 2y.

We show that severe anaemia is most commonly caused by acute leukaemia in this population. However nIDA due to poor infant feeding practise is an important preventable diagnosis and may merit particular health education. A disproportionate number of such patients are from deprived areas. A significant number of patients with nIDA had persistent anaemia >1y post presentation suggesting the need for structured follow-up and ongoing intervention.

## British Society of Paediatric Gastroenterology, Hepatology and Nutrition/British Paediatric Neurology Association

### G188 THE ROLE OF SCREENING INVESTIGATIONS IN CHILDHOOD ARTERIAL ISCHAEMIC STROKE

doi:10.1136/archdischild-2013-304107.200

<sup>1</sup>R Probert, <sup>1</sup>J Ng, <sup>1,2</sup>V Ganesan. <sup>1</sup>*Neurology Department, Great Ormond Street Hospital NHS Foundation Trust, London, UK;* <sup>2</sup>*Neurosciences Unit, University College London, Institute of Child Health, London, UK*

Childhood arterial ischaemic stroke (AIS) is a heterogeneous disorder, with morbidity in 2/3<sup>rd</sup> of survivors and recurrence in 10%. Current clinical guidelines recommend a wide range of investigations

for cerebrovascular, metabolic and thrombotic risk factors. This is expensive and it is unclear how often a positive result alters clinical management.

**Aim** To investigate the (i) diagnostic yield and (ii) impact on treatment of a extensive panel of investigations for childhood AIS risk factors in patients seen in a single tertiary paediatric neurology unit.

**Methods** Children (>28 days old) with radiologically confirmed AIS seen at our centre 2000 – 2011 were eligible. Since 2000 local guidelines have recommended a standard panel of investigations<sup>1</sup> and patients have been managed according to national clinical guidelines. Results and impact on treatment were abstracted from case notes.

**Results** Data from 51 children was reviewed (24 male, age 6 months – 16 years, median 5 years). Cerebrovascular imaging and screening for prothrombotic disorders was most comprehensive; metabolic and infection investigations were largely incomplete.

8/51 patients had prothrombotic risk factors (4 MTHFR homozygous, 1 positive lupus anticoagulant, 2 protein S deficient, 1 Factor V Leiden heterozygous) but these did not alter clinical management. 1 patient was anaemic (requiring blood transfusion) and another had hypercholesterolaemia (treated with statins). Evidence of past infection was frequently identified but did not alter management. In contrast, magnetic resonance angiography (of the circle of Willis and cervical vasculature) was abnormal in 41/51, and influenced onward management in 43 cases. Echocardiography was abnormal in 11/35 available reports. 1 patient had infective endocarditis to which their stroke was attributed and 8 patients had congenital structural abnormalities of varying significance.

**Conclusions** Laboratory investigations for paediatric AIS patients have a low diagnostic yield and rarely alter treatment decisions. Cerebrovascular imaging is often fruitful and is key to management. These data may contribute to prioritisation of health care spending related to the investigation of childhood AIS. Wider laboratory evaluation may, however, be indicated in individual cases, dependent on the clinical circumstances.

#### REFERENCE

1. Kirkham FJ. Stroke in childhood. *Arch Dis Child*. 1999; 81: 85–89.

#### G189 15 YEAR EXPERIENCE OF CLINICAL PRESENTATION OF INTESTINAL VOLVULUS AT A QUARTERNARY GASTROENTEROLOGY CENTRE

doi:10.1136/archdischild-2013-304107.201

LJ Howarth, D Reynolds, S Hill. *Paediatric Gastroenterology, Great Ormond Street Hospital, London, UK*

**Introduction** Intestinal volvulus can cause potentially fatal bowel ischaemia and/or obstruction. Diagnosis can be difficult and easily missed. Presenting symptoms are variable and there are no published studies describing the clinical presentation in children. Earlier diagnosis may reduce morbidity and mortality. Malrotation is a common underlying cause of volvulus and can be asymptomatic, or present with varied gastrointestinal symptoms at all ages[i].

**Aims** To describe our experience over 15 years of the presenting symptoms, age and past history of children presenting with volvulus.

**Methods** This study is based on a case notes review of: All children on the gastroenterology data base presenting with volvulus over the past 15 years.

**Results** 30 cases were reviewed. The age at presentation was variable with 24/30 (80%) presenting by 11 years, leaving a significant minority not presenting until adolescence. The majority of children (90%) presented with vomiting but in a third of cases it was non-bilious. Only 6/30 (20%) of children presented with all the classic symptoms and signs of volvulus: bilious vomiting, abdominal pain,

abdominal distension, and constipation. The majority of children (18/30) had a past history of recurrent abdominal pain for which medical attention had been sought. 11/30 (37%) had a past history of unexplained vomiting and 8/30 (27%) had previous isolated nausea. The minority of children (6/30) had no gastrointestinal symptoms prior to their acute presentation with volvulus.

**Conclusion** Presenting features of acute volvulus are variable and can be confusing. An awareness of the possibility that symptoms and signs may not be classic could be life saving for children and prevent a tragic missed diagnosis. Malrotation is a possible cause of highly non-specific symptoms and should remain part of the differential diagnosis in patients for whom a clear cause of chronic gastrointestinal symptoms cannot be identified.

#### REFERENCE

1. NehraD, Goldstein AM. Intestinal malrotation: varied clinical presentation from infancy through adulthood *Surgery* 2011 Mar; 149(3):386–93

#### G190 COELIAC DISEASE AND RELATIONSHIP TO SOCIO-ECONOMIC STATUS

doi:10.1136/archdischild-2013-304107.202

<sup>2</sup>JA Whitburn, <sup>1</sup>C Spray, <sup>1</sup>BK Sandhu. <sup>1</sup>Paediatric Gastroenterology, Bristol Children's Hospital, Bristol, UK; <sup>2</sup>Paediatric Surgery, John Radcliff Infirmary, Oxford, UK

**Background and aims** Coeliac Disease (CD) comprises an autoimmune enteropathy triggered by gluten. Population screening studies suggest a prevalence of 1% although many remain clinically undetected. It is a genetically determined disease but environment may play a role. The Aim of this study was to establish whether there is a relationship between socio-economic status and diagnosis of CD in childhood.

**Methods** Bristol Children's Hospital is the single regional centre where children from Bristol and SW of England with suspected CD are referred. Prospective data on all children undergoing diagnostic endoscopy is kept and includes postcode of residence. Data on children between 1997 and 2011 and aged 16 years or younger at diagnosis has been analysed. The post code was used to determine index of multiple deprivation (IMD IO) score and rank. The score is a nationally consistent measure of how deprived an area is, pulling together individual indicators chosen to cover a range of economic, social and housing issues to provide an overall measure of socio-economic deprivation.

**Results** 467 children (293 females and 174 males) were diagnosed with endoscopy proven CD. The mean age at diagnosis was 89 months. 73 had a postcode within Bristol City. The study found a strong independent graded association between the incidence rate of CD and socio-economic status. The incidence rate of CD in SW of England was twice as high in the least deprived quintile compared to the most deprived, and in Bristol City it was three times as high.

**Conclusion** There is a strong association between the incidence rate of CD in children and socio economic status with a higher incidence in those who are least deprived suggesting environmental factors may be important.

#### G191 THE MOZART EFFECT IN CHILDREN WITH EPILEPTIC EEGS

doi:10.1136/archdischild-2013-304107.203

<sup>1</sup>EK Grylls, <sup>2</sup>J Rudnay, <sup>2</sup>M Kinsky, <sup>2</sup>A Baggott, <sup>2</sup>C Wabnitz, <sup>2</sup>A McLellan. <sup>1</sup>Colchester University Hospital, Essex, UK; <sup>2</sup>Department of Paediatric Neurosciences, Royal Hospital for Sick Children, Edinburgh, UK

**Background** Listening to Mozart's Sonata for two pianos in D major (K448) has been found to enhance higher brain function such as spatial temporal reasoning and to have an anti-epileptic effect, demonstrated on EEGs (electroencephalograms).