General paediatrics

G160 PREVALENCE AND DISTRIBUTION OF PETECHIAE IN WELL INFANTS

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Introduction: The presence of a non-blanching rash is an important sign in meningococcal disease. In order to determine the specificity of petechiae in unwell children as a marker for disease the prevalence and distribution in the normal population needs to be established. The published literature says little about the presence of such petechiae.

Aims: To determine the prevalence and number of petechiae in well infants.

Methods: One hundred and sixteen apparently healthy infants attending child health clinics for surveillance or immunisation purposes were fully examined between October 2000 and February 2001. Three families refused consent. The number and site of any petechiae were recorded.

Results: Thirty two babies (27.6% 95% confidence interval (CI) 19.7% to 36.7%) had one or more petechiae but in only 4 cases had these been previously noted by the carer. Ten infants (8.6%) had two or more petechiae (95% CI 4.2% to 15.3%) and three (2.6%) had more than two (95% CI 0.5% to 7.4%). Nine infants had petechiae above the nipple line, 18 below the nipple line and 5 in both areas. None of these babies subsequently developed sepsis.

Conclusions: One or two petechial spots are commonly found in healthy infants, their presence alone should not be considered pathological without other clinical signs. In well infants petechiae are more commonly found below the nipple line.

G161 WHAT ARE THE CAUSES OF A NON-BLANCHING RASH IN CHILDREN PRESENTING TO A PAEDIATRIC EMERGENCY DEPARTMENT: A PROSPECTIVE STUDY

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Objectives: to define the causes of a non-blanching rash in children and to examine the influence of age and season.

Design: a prospective cohort study.

Subjects: 233 infants and children up to 15 years of age presenting with a non-blanching rash over a twelve month period.

Setting: the children's accident and emergency department of a large teaching hospital.

Method: clinical features and laboratory investigations were recorded at presentation and analysed.

Results: 87 (37%) had no identifiable cause for their rash. 58 (25%) were directly related to a mechanical cause, 28 (12%) had meningococcal disease, 16 (7%) had a streptococcal tonsillitis, 29 (12%) had an identified viral cause and 15 (6%) had a haematological disorder. Viral infection and meningococcal disease were more common in pre-school children, streptococcal throat infections more common in school children.

Mechanical causes were seen mainly in winter and spring (73%) as was streptococcal throat infection (81%). 50% of meningococcal disease presented in the winter. Respiratory viral infections peaked in the winter, gastrointestinal viral infections in the summer.

Those with mechanical causes for their rash, a previously little described group, were mainly pre-school children presenting with either coughing, vomiting or trauma (93%). 46% had a fever >37.5°C, 95% had petechiae alone (lesions<2mm) with no purpura, 64% had a rash confined to the SVC distribution and the remaining 36% had a trauma-related rash. Although most were well, 88% were admitted (97% for 48 hours or less).

Conclusions: There are several identifiable causes for a non-blanching rash in child. Some have a viral or minor bacterial infection and a minority have meningococcal disease. Mechanical petechiae from coughing, vomiting, or trauma are common.

G162 DOES PARENTAL REPORTING OF SMELLY URINE INDICATE URINARY TRACT INFECTION IN YOUNG CHILDREN?

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Background: Parents often report that young children have "smelly urine" or a particular odour. There is little evidence that these observations are relevant to the diagnosis of urinary tract infection (UTI).

Aim: To determine whether parental reporting of smelly urine is of any relevance to the diagnosis of UTI in children less than 6 years of age.

Design of Study: Analytical, cross-sectional study.

Setting: The paediatric admissions unit of a large district hospital.

Methods: Parents whose children were having urine collected as part of their assessment were given a simple questionnaire to complete regarding the current smell of their child's urine. Parents were asked whether their child's urine smelled different from usual or had a particular smell. Microscopy and culture results of the child's urine were compared to their parent's questionnaire answers to see if there was a correlation between parental reporting of different or particular urine smell and a diagnosis of UTI. Predictive values, sensitivities, and specificities were calculated for each questionnaire answer.

Results: One hundred and ten questionnaires and urine samples were obtained. Fifty two percent of parents thought that their child's urine smelled different from usual or had a particular smell. Only 6.4% of children were diagnosed as having a UTI. There was no statistically significant association between parental reporting of abnormal urine smell and diagnosis of UTI (p=0.709).

Conclusion: In determining whether a young child has a UTI, asking parents about urine smell is unlikely to be of benefit.

G163 DETECTION OF SERIOUS ILLNESS IN ACUTE PAEDIATRIC ADMISSIONS AFTER A LIMITED PERIOD OF OBSERVATION

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Aims: To evaluate the minimum period of observation necessary to detect serious illness (SI) in acute paediatric admissions in a district general hospital setting.

Methods: Analysis of observations made on 250 consecutive acute admissions to a DGH. Serious illness was defined as the need for intravenous fluid or antibiotic treatment, administration of oxygen, acute nasogastic-tube feeding or the presence of an unstable neurological state. Nursing assessments and records of temperature, pulse, respiratory rate and the presence or absence of a non-blanching rash were made at the point of admission and at least at 4hourly intervals from then. The time at which SI became evident was recorded. The positive and negative predictive value of single measurements or combinations of physiological abnormalities were calculated.

Results: 64 (26%) of the 250 admissions had SI during their admission. This was apparent by 4, 8, and 12 hours for 86%, 95%, and 100% of the cohort. Increasing numbers of physiological abnormality were associated with the increasing likelihood of being SI, with 100% prediction of SI for more than 3 such abnormalities. However although specificity for SI was high (82% for pulse rate; 93% for temperature) sensitivity and positive predictive values were low for all such recordings. Absence of physiological abnormality at 4 hours is strongly predictive of a lack of SI.

Conclusions: Observation of undifferentiated acute paediatric admissions for a period of 4 hours will enable sufficient data to be acquired to predict whether or not a child will be seriously ill in over 90% of cases. This may enable safe discharge after a short period of observation for up to 74% of acute paediatric referrals to DGHs.

G164 DEATHS DUE TO INVASIVE PNEUMOCOCCAL DISEASE (IPD) IN ENGLAND AND WALES—A MODEL FOR ESTIMATING EXCESS MORTALITY

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Aim: In the USA, IPD mortality may be underestimated by between 15 and 45%[1]. Our aim was to estimate the proportion of "unspecified" mortality in infants and young children aged 1 month to 4 years as reported by the Office for National Statistics (ONS) by ICD9 code in England and Wales that could reasonably be attributed to IPD.

Methods: Bacterial culture has been the "gold-standard" for the detection of *Streptococcus pneumoniae* in IPD. More sensitive tests such as the polymerase chain reaction (PCR) have been assessed in paediatric populations[2]. We theoretically applied the results of such tests to ONS "unspecified" mortality due to meningitis, septicaemia,

and pneumonia (ICD9 codes 320.9/322.9, 038.9 and 485/486 respectively). We also applied a correction factor of minus 20% for coincidental nasopharyngeal carriage.

Results: There were 14 IPD deaths (3 septicaemia, 8 meningitis, 3 pneumonia) in the age group 1 month to 4 years reported by the ONS for 1999 which is consistent with previous years and with PHLS data. In addition there were 13 deaths due to "unspecified" meningitis, 17 due to "unspecified" septicaemia and 77 due to "unspecified" pneumonia of which 36% (n=5), 13% (n=2), and 29% (n=22) were likely to be due to IPD (43 deaths/year).

Conclusions: Deaths due to paediatric IPD in the UK may be underestimated by up to 67%. This methodology provides a model for estimating the excess mortality due to under-reported diseases.

1. Moore MR, Gamble ML, Zell ER, *et al*. Deaths due to invasive *Streptococcus pneumoniae*, United States, 1996–1998. 39th Annual Meeting of the IDSA, San Fransisco, 25–28 October 2001. Abstract 875.
2. Dagan R, Shriker O, Hazan I, *et al*. Prospective study to determine clinical relevance of detection of pneumococcal DNA in sera of children by PCR. *J Clin Microbiol* 1998;**36**:669–73.

G165 INVASIVE GROUP A STREPTOCOCCAL INFECTION—SERIOUS YET POORLY RECOGNISED

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Background: The incidence of invasive GAS infection although uncommon, appears to be increasing and carries significant risk of morbidity and mortality. However it is not well described in standard paediatric literature.

Aims: To define presenting characteristics and clinical course of invasive GAS infection on a Paediatric Intensive Care Unit (PICU).

Method: Retrospective, descriptive review of all children admitted to PICU from January 1994 to October 2001 with invasive GAS infection. Data was collected regarding age and sex, presenting symptoms and their duration, site of GAS isolation, length of stay and assisted ventilation, presence of shock and multiorgan failure and outcome.

Results: 11 patients were identified. Full data was not available on 2 patients. The average age at presentation was 24 months (range 6 days –5.5years), male: female ratio 10:1. The most consistent presenting features were: Fever and anorexia (78%), rash (67%), cough (56%), prolonged capillary refill time and respiratory distress (44%) and vomiting and diarrhoea (33%). Duration of symptoms was from 3 hours–21 days. GAS was isolated from blood culture (63%), throat swab (27%), pleural aspirate (22%), skin swab, endotracheal aspirate and subperiosteal fluid (11%). 2 patients had pleural effusions, 2 had necrotising fasciitis, 3 had soft tissue infections, 1 had epiglottitis, 1 had tracheitis and 2 had no identifiable focus. The average length of PICU stay was 5.7 days (range 3–10days). 9 Patients were intubated and ventilated for an average of 5.9 days (range 3–9 days). 6 Patients had shock. Renal and hepatic impairment was present in 3 patients and coagulopathy present in 8. 6 patients made a complete recovery, a patient with Trisomy 21 died, 2 developed chronic osteomyelitis, 1 developed a haemopneumothorax requiring thoracic surgery and 1 required skin grafting.

Conclusions: Invasive GAS is a serious, life threatening disease. The challenge for paediatricians is to make an early diagnosis, and treat aggressively.

G166 DOES REMOTENESS FROM ACUTE SERVICES INFLUENCE ACUTE MEDICAL ADMISSIONS IN INFANTS AND YOUNG CHILDREN?

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Aims: Accessibility to acute paediatric services is a sensitive political issue and may modify referral and discharge practice. We therefore reviewed the influence of accessibility on referral to and length of hospital stay for acute illness in infants and young children less than 2 years of age.

Methods: All acute admissions between 1 January 1995 and 31 December 1999 to a single acute paediatric unit in Highland Region (Raigmore Hospital, Inverness) were reviewed. Accessibility was defined as mean travel time (minutes) by road from the largest population centre in each of eight clearly defined sub-regions. Average annual admission rates were calculated per 1,000 children less than 2 years of age in each sub-region.

Results: During the study period, there were 3,046 acute medical admissions in children aged 0–2 years. There was a significant negative association between travel time and admission rate (Spearman rank correlation coefficient = -0.83; p=0.01) but there was no significant association between travel time and length of hospital stay (Spearman rank correlation coefficient = 0.04; p=0.38). In multiple regression with adjustment for regional socio-economic deprivation (proportion of adults receiving income support) the regression coefficient for travel time remained statistically significant (β= -0.321; p=0.028).

Conclusions: In a predominantly rural region and up to a 2-hour travelling time, remoteness from acute paediatric services is associated with lower admission rates of young children and infants with acute medical problems.

G167 HOME CARE FOR SICK CHILDREN—AN UNDERDEVELOPED SERVICE?

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Aim: To establish the extent of current facilities in the UK for the home care of acutely sick children—"Hospital at Home"—which could replace all or part of episodes of inpatient care**.**

Method: A questionnaire was sent out from RCPCH in December 2000 to all paediatric clinical directors listed on the College database.

Results: Responses were received from 153 out of 301 trusts—66 acute units, 44 combined acute/community units and 26 community units. 95 units run home nursing services from their trust, allowing identification of 3 groups:

1 *Biased towards acute care:* 19 (23%) units - mean of 991 children managed at home each year—acute cases 60%— average length of episode of care 1–10 days—high turnover (203 children managed/nurse/year)—70% services available in evenings and weekends, some available at all times.

2 *Divided between chronic and acute on chronic illness:* 46 units—mean of 572 children managed each year—average episode weeks/months—acute cases 32%—moderate turnover (130 children managed/nurse/year).

3 *Entirely chronic illness:* 10 (12%) units—continuing care/episodes for a mean of 144 children/year—low turnover (48 children managed/nurse/year)—mainly small services available in the daytime only.

Impact on inpatient services varied according to the type of team. For mainly acute teams, 41% referrals to home care were replacements for inpatient care, while 37% replaced outpatient appointments or ward attendances. For acute/chronic teams, these figures were 31% and 62% and for chronic teams, 30% and 34% respectively. Impact, especially on inpatient care, was higher for services available at nights and weekends.

Conclusions: Home nursing care can replace inpatient care for some children. Acute episodes are less costly in nursing time than chronic care and are more likely to replace inpatient provision. Many trusts currently have no access to home nursing for acute illness. The use of home nursing services for acute episodes of illness has the potential for considerable further development with reduction in the use of inpatient facilities.

G168 TWO CENTRE COMPARISON OF THE MANAGEMENT OF BRONCHIOLITIS ASSOCIATED APNOEA

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Aims: Apnoea in bronchiolitis commonly results in intubation and positive pressure ventilation (PPV). Nasal CPAP and negative extrathoracic pressure (NPV) have also been used to avoid intubation. We examined the frequency of use of PPV in patients with bronchiolitis associated apnoea cared for in two PICU's, one of which offered NPV.

Methods: Case notes review of all patients referred from 10/93 to 2/97 with a clinical diagnosis of bronchiolitis associated apnoea.

Results: There were 31 (77% RSV+ve) admitted to the NPV centre and 21 (86% RSV+ve) to the centre offering only PPV. There were no significant differences between the two units for the following patient details: age, sex, weight, birth weight or gestation, history of apnoea

of prematurity, days ill before presentation, oxygen requirement at PICU referral, or proportion transferred from other hospitals. There were the following differences in patient management and outcome:

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Management / outcome	PPV-centre	NPV-centre
No of patients admitted	21	31
Number receiving NPV	0	23
Number intubated *(%)*	*(86)* 18	*(26)* 8 *
Median PICU stay (d)	*7*	2 *

*p<0.0001

NPV was used safely and effectively during retrieval of 13 patients from other hospitals.

Conclusions: In these two groups, the use of NPV was associated with less need for PPV and PICU stay. Negative pressure ventilation should be considered in the treatment of bronchiolitis associated apnoea.

G169 USE OF INTRAVENOUS SALBUTAMOL (IVS) IN CHILDREN WITH ACUTE SEVERE ASTHMA: HOW BAD IS THE CONFUSION?

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Background: In response to accumulating evidence, several national guidelines have recently suggested the use of intravenous salbutamol (IVS) in children with acute severe asthma. However, British Thoracic Society guidelines (1997) do not indicate any role for its use. Have these differences caused significant heterogeneity in the management of children with asthma?

Aims: *1.* To describe the use of IVS in children with acute severe asthma prior to referral for intensive care *2.* To identify the role of IVS in asthma protocols across hospitals in the South-East of England

Methods: Data were collected on all children with acute severe asthma referred to a paediatric intensive care unit (PICU) from Sept 1999–Oct 2001. IVS use at the referring hospital, dosing practice, concurrent use with aminophylline and outcome of the referral were recorded. Paediatricians were contacted by telephone in each hospital that referred patients to our PICU in order to establish the use of IVS in their current asthma guidelines and a facsimile copy was obtained.

Results: Out of 51 children on whom data was available, 25 received IVS prior to being referred for intensive care (group 1), a further 23 only after discussion with PICU (group 2). In group 1, most (23/25) children had already received a trial of aminophylline. Only 11 had a bolus dose of IVS (mean 9.6 mcg/kg) and 20 were managed on infusions (mean starting infusion rate 2.7 mcg/kg/min). 19/25 (76%) children from group 1 and 13/23 (57%) from group 2 were subsequently transferred to PICU.

30 out of 61 hospitals contacted used IVS in acute asthma. Most hospitals used it after a trial of aminophylline; only 11 used it as the intravenous bronchodilator of choice. There was widespread variation in dosage.

Conclusions: Lack of consensus between national guidelines has resulted in considerable variation in the use of intravenous salbutamol. The role of this drug in acute asthma needs urgent clarification in order to ensure uniformity in management.

G170 CAN ADENOTONSILLECTOMY BE AVOIDED WITH MEDICAL TREATMENT?

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Aims: To determine if nasal steroids are therapeutic in children on the waiting list for adenotonsillectomy with recurrent tonsillitis (RT) and/or obstructive upper airway symptoms (OS).

Methods: A double blind placebo controlled trial of four months treatment with nasal fluticasone (200ìg/day) prior to adenotonsillectomy in children aged from 4 to 12 years (n=84). Primary outcome measures were defined as a 40% improvement in symptom scores, improvement in sleep study results and cancellation of surgery due to improvement in symptoms. A follow on immunohistology study was undertaken to identify if there was a steroid effect at the cellular level. In this study lymphocyte activation phenotype of tonsil and adenoidal cells were determined using flow cytometry.

Results: Nasal steroids were not found to benefit children on the waiting list for adenotonsillectomy in terms of the primary outcome measures listed. However subgroup analysis of the steroid treated group revealed the following profile: RT alone had a 50% increase in symptoms ($p<0.05$); OS alone had a 40% improvement in symptoms ($p<0.05$); RT and OS together had a mixed picture with no change in symptoms. The immunology results showed that there was a difference in adenoidal T cell phenotype with steroid treatment: an increase in naive T cells ($CD45RA^+$, $p=0.04$) and a reduction in activated T cells ($CD45RO^+$, $p=0.001$ and HLA-DR, $p=0.02$). These are effects that would be predicted with steroid treatment. No such differences were seen in tonsil lymphocyte populations.

Conclusions: As the subjects in the subgroup with OS alone had the same prevalence of atopy as compared with the control group, the improvement in OS is likely to be due to a reduction in adenoidal hypertrophy. The immunology results add weight to this conclusion as they suggest that topical steroids do penetrate the adenoids, reaching a tissue concentration that has an expected pharmacological effect. Thus for children with OS alone nasal steroids may relieve symptoms and for some surgery could be avoided.

G171 DOSE-RESPONSE RELATIONSHIP OF OCCLUSION THERAPY FOR AMBLYOPIA: RESULTS FROM THE MONITORED OCCLUSION TREATMENT FOR AMBLYOPIA STUDY (MOTAS)

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Introduction: Amblyopia is a common visual disorder affecting 3–5% of children. Occlusion therapy is the mainstay treatment, yet neither the effectiveness nor the time course of this treatment is known. Though prescribed occlusion dose may exceed 3,000 hours.

Aims: To determine the kinetics of the dose-response relationship for occlusion therapy.

Methods: Data were obtained from *57* subjects (mean age = 5.1 ± 1.4 years) with amblyopia associated with strabismus (n=22), anisometropia (n=15), and with both anisometropia and strabismus (n=20). Forty-eight subjects required refractive correction and wore spectacles for 18 weeks before starting occlusion. All subjects were prescribed 6 hours occlusion/day. Outcome variables (logMAR visual acuity, log contrast sensitivity and stereoacuity) were assessed at two weekly intervals until gains in visual acuity ceased to be statistically verifiable. Occlusion was objectively recorded using an occlusion dose monitor (Fielder AR, *et al. Lancet,* 1994;**343**:547).

Results: Mean visual acuities at onset and end of occlusion were 0.53 (6/19) ± 0.36 and 0.26 (6/11) ± 0.16 logMAR respectively. Approximately 85% of visual acuity improvement occurred in the first 6 weeks of occlusion. Children ≤5 years showed a greater improvement (change in VA; 0.39 log units (4 chart lines) vs. 0.12 log units (1chart line)) than children > 5 years ($P<0.01$). The relationship between visual acuity gain and total occlusion dose is described by a monotonic function, which for all categories of amblyopia appears to be linear up to 160 hours of total recorded dose.

Conclusions: Occlusion therapy is most effective in the first few weeks of treatment with outcome positively correlated with dose and age.

G172 HAVE FASTING GUIDELINES REDUCED FASTING TIMES IN PAEDIATRIC SURGICAL PATIENTS?

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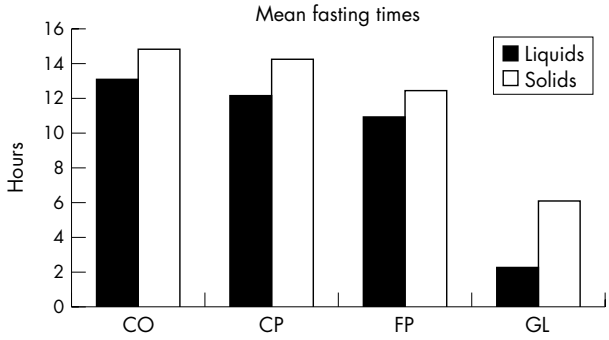
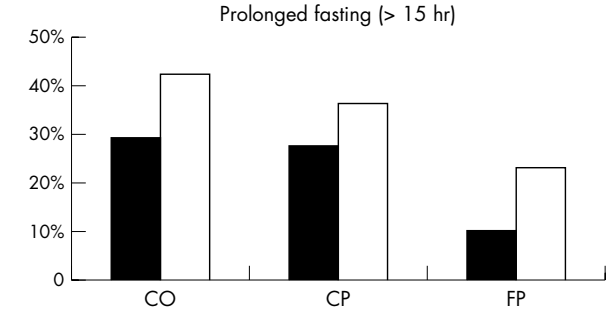
Background: Traditionally despite their vulnerable physiology children have been made to fast similar to adults from midnight prior to elective surgical procedures. Following studies which showed that gastric emptying time in children for clear fluids was 20 minutes, and that clear fluids may in fact accelerate gastric emptying.

Shorter fasting times for children were recommended in 1993. These guidelines specify fasting times of 2 hours for clear liquids and 6 hours for solids for children >1 year. The object of this study was to compare fasting times in three different paediatric surgical centres (two in Cork and one in France).

Methods: Fasting times on surgical patients in paediatric wards were measured in 3 centres, one in France and two in Cork. Fasting





protocol was introduced in the French Hospital (FP) in 1996. This hospital (500 beds) has 40 paediatric surgical beds. In one Cork Hospital (CP) (650 beds, 50 paediatric surgical beds) fasting protocol was introduced in February 1998. In the other Cork Hospital (CO) (200 beds, 15 paediatric surgical beds) no formal guidelines are used regarding preoperative fasting. A single researcher (SW) documented time of last solids, time of last liquid and time to exit ward on the way to surgery in 160 children (median age 6 yrs, Q1–Q3: 3–10 yrs) on the 3 sites. All patients had been admitted at least 12 hours prior to surgery. Children who had been refusing food in the 24 hours leading up to surgery were excluded from the study.

Results: 160 children were studied (FP 53; CP 54; CO 53). Mean fasting time for liquids were in some instances up to 6 times longer than and mean fasting time for solids were more than double the recommended guideline levels (see figure). The hospitals with previously instituted guidelines (CP and FP) had significantly shorter fasting time compared to the Hospital CO without guidelines (11.2hrs V 12.9hrs for liquids, 13.2 hrs V 14.7 hrs for solids). Prolonged fasting from liquids (greater that 15 hours) was more common in both Cork Units (CO 27%, CP 29%) compared to the French Unit (9%) (see figure).

Conclusion: The introduction of fasting guidelines has been associated with mean reduction in fasting times. Worryingly however, over a quarter of all paediatric patients undergoing elective surgery in the Cork Hospitals still fasted for more than 15 hours.

G173 COMPUTERISED WEIGHT AND AGE-BANDED PRESCRIBING REDUCES PAEDIATRIC INPATIENT ERRORS IN A DISTRICT GENERAL HOSPITAL

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Introduction: Paediatric inpatient prescribing has been computerised in our department for the last 12 years. In 2001 the pathway for prescribing 14 common paediatric medicines was changed from traditional clinician calculation ('main pharmacy' pathway) to directed weight and age-banded prescribing ('paediatric' pathway). Individual prescribers can still opt to use either the 'main' or 'paediatric' pharmacy pathways for each medicine.

Aim: To determine whether the 'paediatric' prescribing pathway has reduced prescribing errors.

Method: All paediatric inpatient prescriptions were prospectively collected over a 5 day period and divided into those prescribed via the 'paediatric' pathway, and the 'main pharmacy' pathway, as well as identifying the prescribers as paediatricians or non-paediatricians (surgeons). Prescriptions were analysed, and results presented as error rates.

Abstract G173

		Main pathway	Paediatric pathway	
Paediatricians	Correct	48	78	
	Incorrect	7 (26%)	3 (4%)	P<0.05
Non-Paediatricians	Correct	6	59	
	Incorrect	27 (81%)	4 (6.5%)	P<0.05

Conclusions: Weight and age-banded prescribing has reduced errors from 26% to 4% when used by paediatricians, and from 81% to 6.5% by non-paediatricians. Greater use of this pathway could further improve paediatric inpatient care.

G174 ACCIDENTAL ASPHYXIA, UNASCERTAINED DEATH, OR SUDDEN INFANT DEATH SYNDROME (SIDS)? INVESTIGATION OF SUDDEN UNEXPECTED DEATH IN INFANCY IN BIRMINGHAM AND SOLIHULL 1998–2001

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Aims: Since the introduction of the back to sleep campaign in 1991 there has been a marked reduction in the incidence of sudden unexpected death in infancy (SUDI). The CESDI SUDI report 1993–1996 advised the full investigation of all cases of SUDI and this has been the case in Birmingham since 1998.

Methods: Between 1998–2001 74 cases of SUDI in children under 2 years have been investigated in Birmingham. This included: a full skeletal survey; nasopharyngeal aspirate; blood for culture, amino acids and acylcarnitines; urine for culture, oligosaccharides, and organic acids; Skin biopsy; and a post-mortem by a paediatric pathologist.

Results: Causes of death were: natural (29%), SIDS (27%), unascertained (16%), accidental asphyxia (7%), non-accidental injury (7%), and metabolic disease (4%). The majority of infants were under 14 weeks of age, male and deprived (as measured by the Townsend score). In Asian children natural causes (40%) or SIDS (50%) were the main diagnoses, whereas for Afro-Caribbean children SIDS (10%) was an uncommon diagnosis compared with natural causes (45%), and unascertained/asphyxia (45%).

Six cases of apparent accidental asphyxia were identified: 3 were due to mechanical entrapment, and 3 due to overlay. The unascertained and asphyxia groups shared many features in common including co-sleeping, and evidence of pulmonary haemorrhage or intra-alveolar haemorrhage at post-mortem.

Conclusions: Full investigation of all cases of SUDI has been useful in determining the cause of death. Asphyxia may constitute 24% of cases in view of similarities between those classified as unascertained and asphyxia. The potential dangers of overlay should be incorporated into preventative campaigns.

G175 SYMPTOMATIC HYPOCALCAEMIA (SH) IN INFANCY AND VITAMIN D DEFICIENCY (VDD), PERSISTENCE OF A PREVENTABLE DISEASE & DIFFICULTIES IN MANAGEMENT

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Aims: To determine the incidence and causes of SH in infancy. To identify any problems in management and hence improve practice guidelines.

Patients and Methods: Case note audit of infants admitted with SH, to St George's Hospital, from Jan 1995–Dec 2000. 8 cases were identified, 7 presented with seizures, 1 in cardiac failure. Median age was 15.5 days (range 7–126).

Results: VDD was the cause of SH in all cases. All mothers came from at risk groups, none had received pre or post-natal advice on supplementation. All tested mothers had very low 25-OHVD levels. 1 mother refused blood tests. 6/7 had raised PTH levels despite normal

bone profiles in all. 25-OHVD was low in all but 1 infant, in whom it was sent post 1alfacalcidol treatment. 4 infants, who presented early (aged 7–10 days) had normal/high PO_4 and low PTH levels. This suggested an initial diagnosis of primary hypoparathyroidism, resulting in further investigations for associated disorders. The hypoparathyroidism was transient resolving with VD treatment. The 4 infants who presented later (aged 21–126 days) had high PO_4 and raised PTH levels, suggesting PTH resistance. This was transient resolving with VD treatment. A low Mg^{2+} was seen in 7 infants. Intravenous Ca^{2+} and Mg^{2+} boluses were felt to be warranted in 6 and 5 infants respectively. Intravenous Ca^{2+} infusion was continued in 3 infants, resulting in 1 significant extravasation injury. Diagnostic uncertainty meant that VD treatment was delayed until day 3 in 4 infants and day 15 in one.

Conclusions: VDD leading to SH in infancy still occurs, as antenatal supplements are not universally given in all at risk groups. Hypomagnesaemia, transient hypoparathyroidism and PTH resistance are all seen in VDD. These different biochemical profiles should be incorporated into guidelines for management of SH in infancy. 1alfacalcidol treatment should be started in infants with SH, at presentation, pending confirmation of diagnosis. Ca^{2+} infusions should be stopped as soon as practicable, limiting their use to persistently symptomatic infants and/or those not tolerating oral treatment.

G176 NAIL PATELLA SYNDROME: MUCH MORE THAN A SKELETAL DYSPLASIA

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Aims: To determine the spectrum, incidence and severity of features associated with Nail Patella Syndrome (NPS). To identify mutations in the NPS gene, LMX1B.

Methods: Interview, examination and urinalysis of 123 British NPS patients and review of case notes and *x* rays. Mutation detection by SSCP and direct sequencing.

Results: 98% of patients had fingernail changes. 75% of patellae were hypoplastic and 9% absent. There was loss of extension in 70% of elbows and 12% of patients had pterygia. 19% had congenital talipes. 68% had iliac horns on *x* ray. Renal involvement was present in 25% of patients (33% in > age 40) with an average age at detection of 22 years (1–51). Only 2% had developed renal failure. 7% had ocular hypertension and 10% had glaucoma (12% and 17% in > age 40) with an average age at detection of 48 years (23–78). Involvement of the GI tract was suggested in 31% of patients by irritable bowel syndrome or constipation. 25% described peripheral neurological symptoms and 7% had epilepsy. Mutations of LMX1B were detected in 27/33 families including 16 novel mutations. There were 4 nonsense, 11 missense, 8 potential splice site and 4 frameshift mutations, consistent with the hypothesis that NPS is the result of haploinsufficiency for LMX1B.

Conclusions: Along with the skeletal, renal and ocular features seen in NPS, we suggest that gastrointestinal, neurological and vasomotor symptoms are also part of the NPS phenotype. The broader range of symptoms than classically reported for NPS is in agreement with the pattern of LMX1B expression.

G177 DELAY IN DETECTION OF CLEFT PALATE, AN AUDIT OF NEWBORN CLINICAL EXAMINATION

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Aims: Examination of the newborn is done to detect manifest abnormality. It was evident that a proportion of patients with open cleft palate (CP) presenting to a single referral centre for cleft lip and palate surgery were not identified at that first newborn examination. An audit to ascertain the prevalence and that of symptoms prior to detection was done.

Methods: All referrals found to have CP from 1990 to 2000 were subjected to case note review and a questionnaire was sent to the parents asking for their recall of symptoms such as feeding and breathing difficulties.

Results: 317 individuals were identified. 65% were CP. 35% were submucous cleft palate and were not considered further for this report.

37% of CP were isolated (ICP), 63% had other malformations or syndromes (SCP).

Among ICP 69% were detected within the first 24 hours, 13% the rest of first week, 8% before 2 months and 10% after 2 months (up to 5 years).

In SCP the presence of more than one anomaly improved detection, but not significantly; first 24 hours was 78%, rest of first week 15%, before 2 months 3%, after 2 months 4%.

The size of the cleft, soft only or soft and extending into the hard palate, was not related to delayed detection.

109 CP questionnaires were returned. Feeding difficulties and/or nasal regurgitation of feed were present in all those with delayed detection.

Conclusion: Failure to identify a cleft in 31% with ICP and 22% with SCP in the first 24 hours was found. Associated symptoms were reportedly common before detection.

Improved detection would result from the routine use of direct visualisation of the palate with a spatula and torch.

G178 ABDOMINAL PAIN, APLEY REVISITED

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Aims: The aims of the study were to: 1) Revisit Apley using modern methodology 2) Prospectively assess children with RAP and identify factors associated with organic and non-organic RAP, and within the latter the possibility of IBS as this was unrecognized in Apley's time.

Material and methods: All children, aged over three years, presenting to our Unit with RAP were eligible for this study. All children had a detailed questionnaire completed, a full examination with screening tests (blood for coeliac screen, HP antibody titre, inflammatory markers, serum amylase, liver function tests, and FBC, urine analysis and abdominal ultrasonography). Endoscopy was performed if clinically indicated. IBS was diagnosed if the child fulfilled the Manning criteria (Manning at al, BMJ1987).

Results: 103 children with mean age of 10.04 years (SD 3.44), 60 (58.3 %) girls and 43 (41.7 %) boys were recruited into the study. 31 children (30 %) were found to have organic pathology (8 cases had Helicobacter pylori (HP) gastritis, 9 gastrooesophageal reflux, 7 inflammatory bowel disease, 4 coeliac disease, 1 HP-related duodenal ulcer, 1 food allergy, and one with lactase deficiency). Pain was more common among girls in both groups. Factors associated with organic pain were nocturnal symptoms ($p<0.001$) and abdominal tenderness ($p<0.005$) but not bleeding per rectum. Factors associated with non-organic pain were periumbilical locality (38 V 8, $p<0.005$), pain alleviation on defaecation ($p<0.05$) and low fiber diet ($p<0.005$). 37/72 of children with non-organic pain fulfilled the criteria for IBS.

Conclusion: In 2001 30% of children presenting with RAP are found to have an organic aetiology compared to 8% in Apley's time. Nocturnal pain and abdominal tenderness, but not bleeding per rectum are the most important characteristics of organic pain. 51% of the children with non-organic RAP have IBS.

G179 "THE AFFLUENCE EFFECT"—IS PARTICIPATION IN CLINICAL RESEARCH INFLUENCED BY SOCIO-ECONOMIC STATUS?

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The need for high quality, ethical clinical research in children has been highlighted recently (1). There is however little information about demographic and social factors that affect recruitment of children to research projects. The aim of this study was to determine whether age, sex and socio-economic status influenced the decision of families and children living in an inner city area to participate in a prospective case control study.

The purpose of the study, which included collection of clinical data and , naso-pharyngeal fluid and blood sampling was to investigate mechanisms of viral induced wheezing. This involved recruitment of wheezy children and non wheezy controls aged 5–15 years and studies when the children were well and during an upper respiratory tract infection. Recruitment was conducted from GP surgeries. Nine hundred and ninety five families were contacted. Responses were divided into three groups: Group n-n—families who declined to take part (n=806), Group y-n—families who agreed initially to take part but subsequently withdrew when further information was provided (n=84), and Group y-y—families who agreed to take part and subsequently participated in the study (n=105). Age and sex were documented and Townsend scores were used as a measure of deprivation and were calculated for each family from postcodes. Approximately equal numbers of boys and girls were approached. Townsend

scores ranged from -1.63 to 14.5 Data were analysed using the Kruskal-Wallace Test; a non-parametric analysis of variance.

No significant differences were seen between the three groups in age and sex distribution or distribution of families in relation to Townsend scores. Our data suggest there is a reluctance amoung families for their children to participate in a clinical trial involving some investigations and recruitment was not influenced by socio-economic status.

1. Smyth RL. *BMJ* 2001;**9**:1377–8.