

Child protection

G101 **COULD THIS RETINAL HAEMORRHAGE BE DUE TO SEIZURES/ CARDIOPULMONARY RESUSCITATION/ACUTE LIFE-THREATENING EVENTS OR PROLONGED COUGHING? A SYSTEMATIC REVIEW OF CONFOUNDERS IN RELATION TO ABUSIVE RETINOPATHY**

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Aims: Retinal haemorrhages (RH) carry both clinical and legal significance in suspected child abuse; however, other confounders are frequently proposed in court. We systematically reviewed the association between seizures, cardiopulmonary resuscitation (CPR), acute life-threatening events (ALTE), coughing and RH.

Methods: A literature search of 11 databases, conference abstracts and references from 1950 to 2007. Of 7894 potential studies, 315 underwent two independent reviews by paediatric, ophthalmology and pathology specialists, using standardised critical appraisal methodology. Inclusion: primary studies of live children less than 11 years of age examined for evidence of RH (by an ophthalmologist), due to explicitly confirmed non-abusive aetiologies (CPR, seizure, ALTE, coughing). Exclusion: mixed adult and child data, management or outcome.

Results: We included nine studies (six cross-sectional/three case series) published between 1990 and 2007, including 559 children. RH in association with seizure was only recorded in two of 219 children (aged 6 and 8 months) both in the posterior pole (one unilateral/one bilateral). Only one of 43 children developed diffuse punctuate RH post-CPR. There was no documented association of cough (123 studied) or ALTE (174 studied) as a cause for RH.

Conclusion: RH is a rare complication of seizures or CPR and appears to be confined to the posterior pole. RH has not been described in association with ALTE or coughing, when abuse is excluded. The published literature does not support these as confounders in abusive retinopathy.

G102 **TRANSPLACENTAL ANTI-RO ANTIBODIES FROM MATERNAL SJOGREN'S: A NON-ABUSIVE EXPLANATION FOR ISOLATED MULTIFOCAL HAEMORRHAGIC SUBDURAL EFFUSIONS AND CHRONIC SUBDURAL HAEMATOMA IN INFANCY**

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Aims: The isolated finding of an unexplained chronic subdural haematoma in an infant remains controversial and challenging both clinically and legally, potentially indicating non-accidental head injury (NAHI) if no other cause is found. To contribute to the differential diagnosis of this important and high-risk presentation, we report a previously undescribed cause of multifocal chronic subdural haematoma in infancy that could result in a misdiagnosis of previous NAHI.

Methods: Two infants, aged 3 and 4 months, presented with progressively increasing head circumference measurements. There was no history of encephalopathy. Retinal haemorrhages were not present. Cranial computerised tomography and magnetic resonance imaging demonstrated bilateral subdural fluid collections (of different densities) over the frontal regions that were consistent with either chronic subdural haematomas or haemorrhagic subdural effusions, as well as widened subarachnoid spaces. In view of the possibility of NAHI, child protection investigations were initiated.

Results: In neither case did the child protection investigations raise concerns. Comprehensive investigations for known haematological and metabolic disorders associated with subdural haematomas or

effusions in infants were all normal. In both cases the infant's mother had a history of Sjögren's syndrome and both infants had positive anti-Ro antibody at presentation. Serial imaging confirmed resolution of the subdural and subarachnoid fluid without atrophy, implying external hydrocephalus rather than atrophy at presentation.

Conclusion: Transplacental acquisition of anti-Ro antibodies has been associated with external hydrocephalus. External hydrocephalus has been recognised as a predisposing factor for subdural haemorrhage. These are the first reported cases linking the presence of anti-Ro antibodies with subdural fluid collections in infancy. Anti-Ro antibodies should be added to the checklist of investigations for child protection teams investigating possible NAHI.

G103 **FALLS ONTO THE HEAD AND FACE IN INFANTS UNDER 1 YEAR: ROUTINE ADMISSION OR FOCUSED CHILD PROTECTION HISTORY?**

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Background: Head injury in infants and young children is common and is a significant cause of mortality and morbidity. Non-specific signs and symptoms, different mechanisms of injury and concerns in relation to non-accidental injury make diagnosis and management more difficult. As a result, infants with a history suggestive of a head injury are often admitted for overnight observation and medical/social work review.

Aims: To compare the epidemiology of falls in the two age groups: 0–1 years and 1–2 years. To identify if it is appropriate to admit all infants under 1 year who have sustained a fall onto the head/face, for overnight observation.

Methods: 142 patients under 2 years of age were identified and interviewed at presentation by the emergency department (ED) attendant using a structured questionnaire. Additional information was obtained from the ED records and inpatient chart. Data were collected on patient demographics, history of previous fall and/or admission, characteristics of present fall (location, witnessed, time of fall to presentation, object from which infant fell, height of fall, landing surface), subsequent symptoms and signs of injury and definitive management.

Results: Most falls in the study group occurred among socially deprived families. The male : female ratio was 1.4 : 1. More infants (<1 year) fell within the home (95% vs 76%) and off a stationary object (85% vs 29%). More of the falls occurring in the 1–2 year olds were unwitnessed (29% vs 6%) and resulted from falling down stairs or while running (62% vs 9%). Most children were asymptomatic at presentation. 2% of the under ones and 9% of 1–2 year olds had at least three episodes of vomiting when seen in the ED. General physical examination was normal in 97% of all cases. 56% of under ones and 29% of 1–2 year olds had no visible head injury. A further 9% of infants and 5% of 1–2 year olds had only minor injuries (erythema or abrasion). 83% of infants were admitted; most of those admitted had no or only minor injuries (78%). Only one infant had radiological imaging on the basis of clinical findings (large temporoparietal haematoma). 13% of 1–2 year olds were admitted. None had radiological imaging. All admitted children were seen by an experienced medical practitioner and the social work team and no concerns were raised in relation to non-accidental injury in any of these cases.

Conclusion: Although numbers were small, this study questions the routine admission of 0–1-year-old infants and we suggest that such admissions may not be necessary if a robust child protection safety net is in place in the ED.

G104 MORE NOSEBLEEDS IN INFANTS

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Aims: Recent publications have increased awareness of the significance of oronasal haemorrhage in infants. We reviewed experience in our inpatient population of infants (aged 0–1 year) with oronasal haemorrhage, including any associations and likely causes.

Methods: All paediatricians in one hospital trust notified the named doctor for child protection prospectively of cases meeting the above criteria. Information relating to associated symptoms, likely cause and background risk factors for maltreatment were extracted from case notes.

Results: Seven cases were notified over 1 year, giving an estimated annual local incidence of 12/10 000. Two additional cases with apparent abuse from an adjoining trust are included for descriptive purposes. Eight infants were aged between 2 and 9 weeks, one was 11 months. Aetiology: viral upper respiratory tract infection (one); isolated haemorrhage, cause unknown (three); haemorrhage with respiratory symptoms, cause unknown (one); fraenum tear, respiratory symptoms (one); accidental suffocation (one); deliberate suffocation (two).

Investigations: Two had normal skeletal survey/computed tomography/ophthalmology, all had normal standard clotting screen, three normal extended clotting screens. Four of seven had a history of domestic violence and other social concerns. All were well on follow-up. Of two presenting with severe respiratory distress plus haemorrhage, one had multiple fractures on skeletal survey, one major social risk factors.

Conclusions: Oronasal haemorrhage in infants, although uncommon, may occur more frequently in an inpatient population than a previous report suggests. McIntosh *et al*¹ reported 16 infants under 2 years (eight infants aged 0–1 year) over 10 years attending hospital emergency departments or admitted (incidence of 0.94/10 000 per year), all over 7 weeks of age. Our study included only inpatient infants and suggests a higher incidence and younger age. Frequent social concern and suspected maltreatment in some cases highlights a potential high risk for such infants. The study supports the need for careful assessment to establish the cause of oronasal haemorrhage in this age group.

1. **McIntosh N**, Mok JYQ, Margerison A. Epidemiology of oronasal haemorrhage in the first 2 years of life: implications for child protection. *Pediatrics* 2007;**120**:1–5.

G105 SPINAL INJURY IN PHYSICAL CHILD ABUSE

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Aim: Spinal injury is uncommon in children. Two infant abuse cases that hit the headlines had serious spinal injury. This systematic review of the international scientific literature addressed the question “What are the clinical and radiological features of spinal injury in physical abuse?” and made recommendations as to which children should be investigated and how.

Methods: An all-language literature search of 20 databases, using relevant keywords (1950–2008) in which potential studies were reviewed by two reviewers (a third on disagreement). Inclusion criteria: primary studies of spinal injury in physical abuse in children under 18 years; children who were alive on admission with musculoskeletal injury to the spine, with or without injury to the spinal cord (SC) and SC injury without radiological abnormality.

Results: 15 studies were included, describing 24 children who fell into two groups: Group 1: 14 children (median age 6 months) had cervical injury, nine of 14 had co-existent intracranial injury. All nine presented with neurological impairment, two had respiratory impairment, five were comatose. Five of these children died, two became quadriplegic and two made a full recovery. Of the five children without head injury two had spinal deformity and two neurological impairment. One of five of those without head injury sustained quadriplegia and one moderate disability. Four of 14 had musculoskeletal injury alone, five had musculoskeletal and SC injury, and five had SC injury without radiological abnormality. Group 2: Ten older infants (median age 14 months) had thoracolumbar/sacral injuries. Seven of 10 presented with an obvious orthopaedic deformity (one presented late with kyphosis) and six cases had focal neurological signs specific to SC injury. Six of 10 sustained residual neurological deficit. The cause was confirmed in 17 cases. 14/17 had shaking or impact injury, all had cervical cord injury and intracranial injury. Two children with thoracolumbar injury were thrown and one sustained thoracolumbar hyperflexion. The diagnosis was missed initially in seven of 14 cases despite neurological symptoms or spinal deformity.

Conclusions: Spinal injury is a rarely reported injury in physical abuse. Magnetic resonance imaging (MRI) of the cervical spine should be performed in babies when inflicted head injury is suspected. Any child with unexplained spinal deformity, focal neurology or skeletal abnormality identified on a skeletal survey should have an MRI scan to exclude spinal cord injury.