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EDITORIAL

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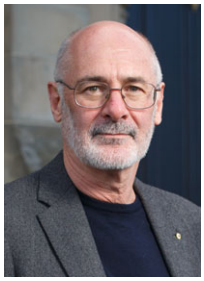
Subdural haemorrhage in infants: abuse or natural causes? The importance of thorough child death review



The designation 'abusive head trauma' (AHT) is the term preferred by the American Academy of Pediatrics for infants who have suffered intracranial injury caused by blunt trauma or violent shaking (1). It has been suggested, however, that a more general term, such as 'blunt craniocerebral trauma', may be preferable initially as this does not imply intent.

The diagnosis of AHT has commonly been based upon the presence of subdural haemorrhage, with or without retinal haemorrhage and/or encephalopathy – the so-called triad. The significance of the 'triad' has however been called into question, and, whilst it is commonly perceived as being suggestive of a preceding episode of shaking, or shaking plus impact, it is now widely recognised that this combination of findings is certainly not pathognomonic for abusive head injury (2). The use of this term remains controversial and a recent systematic review conducted by the Swedish Agency for Health Technology Assessment (3) concluded that 'there is limited scientific evidence that the triad and therefore its components can be associated with traumatic shaking'. This systematic review has however been strongly criticised and major methodological flaws have been described (2), most importantly pointing out the limitation of the study to the so-called triad, rather than to subdural haemorrhage with or without other signs of possible abuse.

It is now clear that the presence of subdural haemorrhage in asymptomatic newborn infants is common (4), although for most infants who have been studied the haemorrhage is no longer detectable by MRI scanning after about four weeks of age.

The difficulty faced by clinicians dealing with live infants with subdural haemorrhage, and by pathologists who find subdural haemorrhage at autopsy, is in interpreting whether this finding is a possible indicator of child abuse, or whether it is merely a persistent finding from the time of birth. Dating of the age of a subdural haemorrhage by means of CT or MRI scanning has wide confidence intervals and may be less precise than has commonly been assumed (5); histology is also relatively imprecise, making this a judgement that must be based upon very careful consideration of the history and circumstances of the infant's presentation and/or death.

Studies of infants presenting with subdural haemorrhage, with or without retinal haemorrhages or encephalopathy, that was attributed to AHT in the UK have reported mortality rates of 15% (6) and 27% (7), giving estimated rates of infants dying with AHT of 3.9 and 5.7 per 100 000 live infants, respectively.

In a study based on the records of the National Board of Forensic Medicine in Sweden together with death certification records for the period 1994–2013 inclusive, Andersson and Thiblin (8) have attempted to identify all infants with a probable diagnosis of AHT. They conclude that amongst the infants whose deaths were certified as being due to sudden infant death syndrome (SIDS) (all of whom underwent forensic autopsy including examination of the central nervous system), there were no deaths from AHT. Amongst the 733 infants in this 20-year period in whom forensic autopsies were conducted for other reasons, 28 infants were identified with evidence of intracranial injuries. After consideration of the circumstances of the infants' deaths, 12 of these 28 infants had findings suggesting possible AHT, and of these, eight were labelled by these investigators as probably being due to AHT.

There were however 33 infants over an eight-year period (2006-2013) whose cause of death was labelled as unascertained (ICD10 code R99), but in whom no post-mortem examination was performed, and no clinical information was available as to the nature and possible cause of their deaths.

The authors concluded that, if none of the infants whose deaths were labelled 'unascertained' were due to AHT, the incidence of death from AHT in Sweden is between 0.4 and 0.6 per 100 000 infants, a striking figure approximately one-tenth of that identified in the UK (6,7) or Estonia (9). Given the possibility that up to 33 infant deaths in eight years (approximately 4 per 100 000 infants) were unascertained and did not undergo autopsy examinations, the precise number of deaths from AHT remains speculative, although it seems unlikely, given the Swedish system of death certification that many of the infants in the 'unascertained' category had suffered abusive head trauma. The authors of this study did experience a considerable difficulty in

obtaining reliable and robust data on investigations that had been conducted after the deaths of infants over this period of 20 years.

If the findings of this study are correct, the incidence of infant death from AHT in Sweden appears to be markedly lower than has previously been reported from other countries, which would be in keeping with the reported lower (and possibly falling) incidence of infant homicide in Sweden (10). Whether such a finding represents possible consequences of the high quality of health and social care in Sweden, the robust child protection legislation (smacking children having been illegal in Sweden since 1979), or other factors is unclear. It is also important to recognise the possibility that variation in investigations after unexpected infant deaths and the lack of routine multi-agency investigation may also be a contributory factor. Specifically, the most reliable estimates of trends based on autopsy records should be prospective, as retrospective analyses from multiple centres documenting findings over many years may be skewed by several factors (11). This should also ideally incorporate the findings of multi-disciplinary infant/child mortality review committees.

The introduction in several countries of the statutory, multi-agency investigation of all child deaths through such interdisciplinary committees has allowed the identification of potentially avoidable contributory factors, the recognition of failures in the provision of adequate health and social care support, and the more robust identification of instances of overt or covert abuse leading to death (12).

This study provides strong evidence to support the introduction of routine multi-agency investigations into all child deaths.

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Peter Fleming (peter.fleming@bristol.ac.uk),[1]
Roger W. Byard[2]
1.Centre for Child and Adolescent Health, Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK
2.The University of Adelaide, Adelaide, SA, Australia

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