Unexpected infant death: lessons from the Sally Clark case

Roger W Byard

On 9 November 1999, a 35-year-old lawyer, Sally Clark, was convicted of the murder of her two infant sons by a majority of 10 to 2 in the Chester (UK) Crown Court. An appeal against the conviction was dismissed on 2 October 2000. Following review by the Criminal Cases Review Commission and amid considerable media attention, the conviction was quashed by a second court of appeal[1] on 28 January 2003. The Crown did not seek retrial, a decision that the court of appeal agreed with.

The Clark case raises a number of important issues for police, physicians and lawyers concerning the handling of cases of unexpected infant death. Fundamental errors were made in the assessment of autopsy findings, in the interpretation of the results and in the application of statistics to such cases. Sally Clark was wrongly jailed for 3 years and the credibility of medicolegal processes was significantly damaged. To quote Sally Clark on her release, "There are no winners here".[2]

To briefly summarise the cases: on 13 December 1996, Christopher Clark, at the age of 11 weeks, was found dead by his mother. The cause of death was initially recorded as lower respiratory infection, but this was changed to suffocation following a review of the findings after his 8-week-old brother, Harry, had subsequently been found dead by his mother on 26 January 1998. Both infants had appeared well before their deaths. Both infant autopsies were performed by a pathologist with no specific training in paediatric forensic pathology.

Initial autopsy findings

The initial reported autopsy findings for Christopher included minor laceration and bruising of the frenulum of the upper lip, recent intra-alveolar haemorrhage, haemosiderin-containing macrophages within the lungs, and multiple small bruises of the limbs. His only significant clinical history was of a bleeding nose 2 weeks before death in a London hotel room where his family were staying. His father had been looking after him at the time and hotel staff had witnessed the episode.

Harry's initial reported autopsy findings included a healing fracture of the right second rib, costochondral fracture dislocation of the right first rib, retinal haemorrhages, retinal haemosiderin deposition and inflammation, acute inflammation and bruising of the paraspinal muscles, extradural haemorrhage and swelling of the spinal cord, cerebral hypoxia–ischaemia, cerebral laceration and haemorrhage, occasional petechial haemorrhages of the left eyelid, haemorrhage on the surface of the eyeballs, and haemosiderin staining of the meninges. Death was initially attributed to shaken-impact syndrome, which was then revoked in favour of a diagnosis of inflicted suffocation.

Forensic Science Centre, Adelaide, SA.
Roger W Byard, MD, FRCPath, Specialist Forensic Pathologist; and Clinical Professor of Pathology and Paediatrics, University of Adelaide.
Reprints will not be available from the author. Correspondence: Professor Roger W Byard, Forensic Science Centre, 21 Divett Place, Adelaide, SA 5061.
byard.roger@saugov.sa.gov.au

ABSTRACT

- In November 1999, in the United Kingdom, a woman was convicted of the murder of her two infant sons. An appeal against the conviction was dismissed in October 2000, but the conviction was quashed by a second court of appeal in January 2003.
- Review of the autopsy findings showed that standard procedures had not always been followed, thus limiting verification of the alleged findings. Some potentially important diagnoses and conclusions were also altered over time.
- This case and its sequelae demonstrate the difficulties that may arise if cases are not fully investigated by pathologists with specific training or experience in paediatric forensic pathology, with all of the results being clearly summarised and discussed in autopsy reports.
- Trying to clarify findings, diagnoses and circumstances of death at a later stage may simply not be feasible, owing to a wide variety of possibilities other than inflicted injury.
- This type of case has unfortunately led to mistrust of the medical and legal systems and has made the investigation of such emotive and tragic cases all the harder.

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Review of autopsy findings

Christopher

Review of the pathology evidence reveals some very disturbing features. For example, it was not possible to verify whether Christopher in fact had any injuries, as the postmortem photographs were of poor quality, the bruises were not incised and rephotographed to distinguish them from simple postmortem lividity, and no histological samples were taken. Of note, the alleged bruises were not observed by medical staff or police officers at the hospital where resuscitation was attempted. It is also possible that some of the reported injuries may have been caused by resuscitative efforts.

Intra-alveolar haemorrhage, which was not noted in the initial autopsy report, was used, along with haemosiderin-containing macrophages, to support suffocation as the cause of Christopher's death.[3,4] However, both of these findings are recognised as non-specific. Intra-alveolar haemorrhage is common, and is altered by prolonged postmortem intervals, attempts at resuscitation, the areas of the lungs where samples are taken and the position of an infant's body after death.[5] Haemosiderin-containing macrophages are also found in a variety of circumstances.[6,7] It is also possible that they may have resulted from Christopher's independently verified nose-bleed 2 weeks before death. It did not appear that his nasal passages were examined at autopsy for an alternative source of the haemorrhage, such as a vascular malformation. There was no evidence of lethal lower respiratory infection, despite this being reported as the cause of death in the initial autopsy report. Based on the uncertainties in this case, it appears most appropriate to

classify the death as "undetermined". There was certainly no verifiable evidence of inflicted injury.

Harry

The initial cause of Harry's death, based on a collection of typical and not-so-typical findings, was reported as shaken-impact syndrome. The diagnosis of retinal haemorrhage, which was quite crucial to support the possibility of shaking, was, however, incorrect. The retinal vessels were found, on independent review, to be merely congested. Retinal haemorrhages had also not been present when Harry had been examined at the hospital where resuscitation was attempted. Although not a recognised feature of shaken-impact syndrome,[8] cerebral laceration was also used to support a diagnosis of shaking. However, these injuries were subsequently determined to be postmortem artefact arising at the time of brain removal. Given the unreliability of these findings and the absence of typical features of shaken-impact syndrome, such as retinal haemorrhages, subdural haemorrhages and axonal damage, the cause of death was changed to suffocation. To support this, several unusual features were proposed, including episcleral haemorrhages within the soft tissues around the eyeballs. However, this has not been reported in the literature as a marker for suffocation and is most likely an artefact caused by disruption of delicate vessels at the time of enucleation.

Other findings, such as retinal haemosiderin deposition and inflammation, acute inflammation and bruising of the paraspinal muscles, extradural haemorrhage and swelling of the spinal cord, cerebral hypoxia–ischaemia, cerebral haemorrhage, and haemosiderin staining of the meninges, were either not verifiable, were incidental findings, or were postmortem artefact.

While the alleged costochondral fracture dislocation of the right first rib could not be verified, as it had not been photographed or sampled histologically, there did appear to be evidence of a healing fracture of the right second rib on histology. This would be an unusual birth injury and may well have resulted from non-lethal compressive chest trauma in the weeks before death.

The presence of petechial haemorrhages of the left eyelid was also of concern, as this may occur with inflicted asphyxia or strangulation.[9] Skin petechiae may also occur when there is sepsis, and one of the most significant findings in Harry's case, which had not been put before the original court or first court of appeal, was the presence of a pure growth of *Staphylococcus aureus* from five separate sites (throat, bronchus, trachea, stomach and cerebrospinal fluid) in association with a mild acute inflammatory infiltrate in the cerebrospinal fluid. Neither lawyers for the prosecution nor the defence were aware of these results, as they had not been referred to by the examining pathologist in his autopsy report. Despite assertions from several medical experts that the results were merely postmortem contamination or incidental, I considered that Harry's death was caused by staphylococcal sepsis.

Misleading statistics

Although it was stated in the primary court case that the chance of a second death in the same family attributable to sudden infant death syndrome (SIDS) was 1 in 73 million, this has been convincingly rebutted in a number of publications.[2,10] However, as the cases would not be attributed to SIDS using the standard definition,[11] the use of so-called SIDS statistics was really not appropriate. Despite this, it has been speculated that the use of such figures may have had considerable influence on the jury's decision.[10]

Implications of the Clark case

This tragic case raises a number of important issues, not the least of which being that lethal pathological processes in infants are often not clear-cut and have poorly understood underlying mechanisms. These difficulties are magnified if investigations and interpretations are inadequate. The cases described here clearly demonstrate persistent problems that beset the investigation of unexpected infant deaths and their presentation to courts. A summary I prepared for the defence detailing aspects of this was cited by the second court of appeal:[1]

> Unfortunately there were significant and ongoing problems in the investigation of these deaths. Standard protocols were not followed and essential steps such as routine dissection and histology were omitted which prevented verification of alleged autopsy findings.[12] As well, a number of potentially important diagnoses and conclusions were altered over time. For example, Christopher's initial cause of death of lower respiratory tract infection was withdrawn and observations of no significant haemorrhage within his lungs were changed to marked haemorrhage. The finding of retinal haemorrhages in Harry which was vital to sustain the diagnosis of shaken-impact syndrome was altered to no haemorrhage, brain lacerations were found to represent postmortem artefact, swelling of the spinal cord was not present and bruising of paraspinal tissues was also not able to be substantiated. This is not a unique situation with statements in the literature in recent years that "investigations into the pathology and circumstances of sudden infant death are often scanty and inexpert" with significant omissions being documented when cases were audited.[13-14] The Clark brothers demonstrate difficulties that may arise if cases are not fully investigated[15] with all of the results being clearly summarised and discussed in the autopsy report. Trying to clarify findings, diagnoses and circumstances of death at a later stage may simply not be feasible due to a wide variety of possibilities other than inflicted injury.

Conclusion

The Clark case emphasises the need for impeccable investigation of infant deaths, with appropriate peer-reviewed analysis of possible mechanisms and causes of death. In addition, pathologists must have training or experience in handling infant cases, and findings and investigations must be recorded in such a way that subsequent reviews are facilitated. The legacy of Sally Clark will certainly not be forgotten by the legal and medical professions or by parents and child carers, and neither should it be.

In March 2004, at a workshop in Canberra sponsored by SIDS and Kids Australia, forensic and paediatric pathologists agreed upon implementing a standardised national autopsy approach to unexpected infant deaths in Australia and upon a common definition of SIDS, in the hope that this will minimise the risk of similar cases arising in the future.

Competing interests

None identified.

References

1 *R v Clark* (2003) EWCA Crim 1020.
2 Bacon CJ. The case of Sally Clark. *J R Soc Med* 2003; 96: 105.
3 Yukawa N, Carter N, Rutty G, Green MA. Intra-alveolar haemorrhage in sudden infant death syndrome: a cause for concern? *J Clin Pathol* 1999; 52: 581-587.
4 Becroft DM, Lockett BK. Intra-alveolar pulmonary siderophages in sudden infant death: a marker for previous imposed suffocation. *Pathology* 1997; 29: 60-63.
5 Hanzlick R. Pulmonary hemorrhage in deceased infants. Baseline data for further study of infant mortality. *Am J Forensic Med Pathol* 2001; 22: 188-192.
6 Byard RW. Sudden death in infancy, childhood and adolescence. 2nd ed. Cambridge: Cambridge University Press, 2004: 77-166.
7 Byard RW, Stewart WA, Telfer S, Beal SM. Assessment of pulmonary and intrathymic hemosiderin deposition in sudden infant death syndrome. *Pediatr Pathol Lab Med* 1997; 17: 275-282.
8 Krous HF, Byard RW. Shaken infant syndrome: selected controversies. *Pediatr Dev Pathol* 1999; 2: 497-498.
9 Byard RW, Krous HF. Petechial hemorrhage and unexpected infant deaths. *Leg Med (Tokyo)* 1999; 1: 193-197.
10 Watkins SJ. Conviction by mathematical error? *BMJ* 2000; 320: 2-3.
11 Willinger M, James LS, Catz C. Defining the sudden infant death syndrome (SIDS): deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatr Pathol* 1991; 11: 677-684.
12 Krous HF, Byard RW. International Standardised Autopsy Protocol for sudden unexpected infant death. Appendix 1. In: Byard RW, Krous HF, editors. Sudden infant death syndrome — problems, progress and possibilities. London: Arnold, 2000: 319-333.
13 Unexplained deaths in infancy. *Lancet* 1999; 353: 161.
14 Bacon CJ. Cot death after CESDI. *Arch Dis Child* 1997; 76: 171-173.
15 Byard RW. Inaccurate classification of infant deaths in Australia: a pervasive and persistent problem. *Med J Aust* 2001; 175: 5-7.

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