

Pulmonary intra-alveolar hemorrhage in SIDS revisited – A different pattern in prone sleepers versus bed-sharers

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Objective: The sudden unexpected death of an infant that remain unexplained after complete post-mortem investigation including autopsy is designated Sudden Infant Death Syndrome (SIDS). Pulmonary intra-alveolar hemorrhage (IAH) has been suggested a marker of suffocation. Previous studies have shown that IAH may be present in SIDS, raising concern that some are missed cases of suffocation. We postulate that SIDS consist of different entities with separate death mechanisms. Our hypothesis is that the patterns of IAH in SIDS victims found dead in prone position in own bed differs from the patterns observed in SIDS victims found after bed-sharing with adults. Moreover, that they both differ from the patterns observed in unambiguous cases of suffocation.

Methods: From the research biobank of infant and early childhood deaths examined by forensic autopsy in Oslo between 1987 and 2021 we selected 79 cases: 20 SIDS cases found prone, 20 SIDS bed-sharing victims all found supine, 19 cases of asphyxia (7 suffocation, 12 strangulation) and 20 cases of violent deaths. HAS-stained histological lung sections was blindly evaluated and intra-alveolar hemorrhage graded semi-quantitatively from absent to severe (0 to 4).

Preliminary results: Widespread and severe IAH (grade 3-4) was observed in 75% of the bed-sharing SIDS cases, compared to 10% of the prone-positioned SIDS cases ($p < 0.05$). Grade 3-4 IAH was observed in 30% (6/20) of the violent deaths and 21% (4/19) of the deaths due to asphyxia. In the last group, all four were victims of inflicted suffocation. No or mild IAH (grade 0-1) was observed in 80% of the prone-positioned SIDS, 15% of the bed-sharing SIDS, 50% of the violent deaths and 47% of the deaths due to asphyxia.

Conclusion: Our results indicate that widespread and severe IAH is common in bed-sharing SIDS and less common in prone-positioned SIDS. This suggests that bed-sharing involves a different death mechanism than prone sleeping. Mechanical obstruction of airways may play a significant role. However, based on the preliminary results caution should be made to interpret severe IAH alone as a marker for suffocation.