



Pathology & Biology Section – 2008

G32 Multiple Histories: A Statistically Significant Indicator of Non-Accidental Injury in Children

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After attending this presentation, attendees will be able to describe circumstances under which multiple histories are provided by caregivers and describe the validity of using multiple histories as a marker of non-accidental injuries in children.

This presentation will impact the forensic science community by allowing forensic scientists to have a scientific basis for the use of multiple histories as a marker of non-accidental injuries in children.

Forensic pathologists are increasingly being asked to state the bases for conclusions. How do we know that multiple histories are a marker of non-accidental injury in children? The early descriptive studies have shown that many shifting histories are associated with the "Battered Baby" syndrome, recently described as non-accidental or inflicted injuries in children. In individual cases, more than one history provided by the caregiver is excused as the result of a caregiver feeling "upset" at the child's injury and death, or simply a matter of providing an initially incomplete history. The usefulness of considering the number of caregiver histories in a variety of causes of death can be assessed by reviewing a group of child death investigations.

Examining the causes and manners of death, and the number of trauma histories for a group of 169 child deaths provides additional support for suspicion raised by multiple histories. Cause and manner of death and the number of trauma histories was gathered as part of investigations of a group of 169 randomly selected child deaths examined over a seven year period. The child deaths occurred as the result of non-accidental injury as well as motor vehicle collisions, falls, drownings, various asphyxial deaths, and natural diseases. Non-accidental injury was distinguished from accidental injury, undetermined causes, and natural disease by investigation of medical and social history, and circumstances surrounding collapse as well as autopsy findings.

The causes of death included: 11 asphyxias (6.5%), 13 central nervous system diseases (7.7%), 80 head injuries (47.3%), 8 drownings (4.7%), 3 heart diseases (1.8%), 5 infections (3.0%), 2 other disease deaths (one each: volvulus and dehydration, 1.2%), 11 respiratory diseases (6.5%), 13 Sudden Infant Death Syndrome (7.7%), 13 blunt force injuries of trunk (7.7%), and 10 undetermined (5.9%).

Only two of the asphyxial deaths were non-accidental injuries and in both, one trauma history was provided. In one it was a confession, the other was unrelated to the cause of death. Most of the head injury deaths, 61, were non-accidental. In 11, no history was provided. One and two histories were given in 21 and 22 cases respectively. "Multiple histories" (more than two) were found in seven death investigations: four cases had three histories, two cases had four histories, and one case had five. The 2nd through 5th histories were closer approximations of mechanisms of sufficient magnitude to produce the injuries found at autopsy. All of the trunk injury deaths were non-accidental. Five cases had no trauma history, six cases had one trauma history which was usually inadequate to account for the injuries found, but only two provided a second history.

Most (six) of the nine accidental asphyxial deaths had one adequate history to explain the injuries. In two cases no one knew what had happened, and in one other misinformation provided two histories. Most (sixteen) of the accidental head injury deaths had one adequate history. In three others a second history was needed to conclude that the explanation was adequate. All eight drownings had one adequate history.

Only two of forty-one natural deaths had even one trauma history. One child with a medulloblastoma had fallen off the couch a week prior to his collapse. The other child suffered a spontaneous subarachnoid hemorrhage and hit her head when she collapsed.

In this group, 31/76 (40.8%) with non-accidental deaths had two or more histories. For accidental and natural deaths (omitting the ten undetermined deaths), 4/83 (4.8%) had more than one trauma history. In a 2x2 table more than one history had a sensitivity of 40.8% for non-accidental injury deaths. The specificity of fewer than two histories and accidental or natural disease was 95.2%. The predictive value of non-accidental injury when many histories were provided was 88.6%. The predictive value of finding accidental or natural disease when fewer than two histories were provided was 64.8%. A Yates corrected Chi square is 23 with a P value of <<0.01 and odds ratio of 0.11 (with confidence interval of 0.04-0.58) for non-accidental injuries being found when fewer than two histories are provided by the caregiver.

Non-Accidental Injury, Multiple Histories, Child Abuse