Brain Hypoxia is Associated with Dural Bleeding Under 3 Years of Age

Bleeding around the brain has long been considered a significant component of injuries that lead doctors to suspect a nonaccidental head injury, or shaken baby syndrome. However, such hemorrhaging is not always associated with trauma, a point the authors emphasize in the current study in Pediatric and Developmental Pathology, which focused on nontraumatic cases and investigated the associations between bleeding in the brain and brain damage due to lack of oxygen.

Lawrence, KS (PRWEB) July 09, 2013 -- Pediatric and Developmental Pathology – There is a strong association between bleeding in certain areas of the brain and brain damage due to lack of oxygen. The study focused on bleeding in the thin membrane between the brain’s hemispheres (falx/dural fold), beneath the fibrous membrane separating the brain from the cerebellum (tentorium/dural fold), and covering the brain and the spinal cord (dura). By studying such intradural and subdural bleeding, researchers and doctors hope to understand how this condition progresses and develops.

Seeking evidence of the link, the authors of an article published in the current issue of the journal Pediatric and Developmental Pathology analyzed autopsies of more than 250 fetuses (gestational age of at least 24 weeks) and more than 380 infants and children up to 3 years of age. The autopsies were performed at two UK hospitals between 2007 and 2009.

Bleeding around the brain has long been considered a significant component of injuries that lead doctors to suspect a nonaccidental head injury, or shaken baby syndrome. For newborns, subdural hemorrhaging has also “been blamed on the trauma of labor.” However, such hemorrhaging is not always associated with trauma, a point the authors emphasize in the current study, which focused on nontraumatic cases. Instead, the authors studied the presence of such bleeding in the dura and its association with lack of oxygen in the brain, or hypoxic-ischemic encephalopathy (HIE).

In their examination of postmortem reports, the authors noted the given age group, gestational and chronological age, type of delivery, and whether there was evidence subdural bleeding, intradural bleeding, and HIE.

By comparing these data, the authors found a “clear relationship” between subdural hemorrhaging and HIE. Fetuses with brain hypoxia showed signs of such bleeding three times more often than those without HIE; for infants and children, the frequency increased 25 times when HIE was present.

Although the authors found a high frequency of intradural hemorrhaging for all age groups, they noted a “progressive reduction” in subdural bleeding with age. According to the authors, a possible explanation is that the less developed brain and vascular system of younger babies, compared with toddlers, predisposes infants to dural bleeding.

The authors concluded that the severity of dural bleeding was associated with the amount of time the brain was deprived of oxygen, confirming the link between dural bleeding and HIE. However, they emphasized that not all infants with brain hypoxia showed signs of subdural bleeding and that other factors, such as increased intracranial pressure and abnormal blood clotting, must “be implicated in the cases that do.”
Full text of “Nontraumatic Intradural and Subdural Hemorrhage and Hypoxic Ischemic Encephalopathy in Fetuses, Infants, and Children up to Three Years of Age: Analysis of Two Audits of 636 Cases from Two Referral Centers in the United Kingdom,” Pediatric and Developmental Pathology, Vol. 16, 2013, is available at http://www.pedpath.org/doi/full/10.2350/12-08-1232-OA.1

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