

Chiropractic Care of Children

RECOMMENDATION

Since vertebral subluxation may affect individuals at any age, chiropractic care may be indicated at any time after birth. As with any age group, however, care must be taken to select adjustment methods most appropriate to the patient's stage of development and overall spinal integrity. Parental education by the subluxation-centered chiropractor concerning the importance of evaluating children for the presence of vertebral subluxation is encouraged.

Rating: Established

Evidence: E, L

Commentary

Schneider and Burns(1) published the results of a blinded study describing the relationship of atlanto-occipital hypermobility to sudden infant death syndrome (SIDS). These authors described the phenomenon of "atlas inversion" where the posterior arch of C-1 enters the foramen magnum. They further stated, "Relative measurements suggested that a correlation existed between instability in the atlantooccipital articulation and sudden infant death syndrome." Instability is a manifestation of vertebral subluxation.

These findings corroborate those of Giles, Bina and Sotrel in their paper, "Infantile atlanto-occipital instability." (2) These investigators studied 17 infant cadavers. Eleven were SIDS cases and six were non-SIDS cases. Ten of the 17 cases demonstrated atlas inversion, and all ten cases were in the SIDS group. These authors also suggested that atlanto-occipital instability may be a factor in other conditions. They stated, "At this early stage in the development of our notions about the potential contribution of atlanto-occipital instability to deaths in infants, it is very difficult to assess the role of this proposed mechanism in the death of an infant with a conventional disease. Thus, one might anticipate that the 'controls' will be contaminated by children who had a conventional disease, but whose death was, in fact, caused by this mechanism."

Towbin(3) addressed the clinical significance of spinal cord and brain stem injury at birth, noting that such damage is often latent and undiagnosed. According to Towbin, "Death of the fetus may occur during delivery or, with respiratory function depressed, a short period after birth. Infants who survive the initial effects may be left with severe nervous system defects. In some, the neurologic sequelae are attributable directly to the primary lesion in the cord or brain stem; in others, secondary cerebral damage results, a consequence of the imposed period of hypoxia at birth." Chesire(4) described three cases of traumatic myelopathy in children without demonstrable vertebral trauma. In this paper, the classical mechanism of trauma is said to be hyperextension of the cervical spine in a difficult breech delivery. Although tetraplegia may result, the x-rays are described as "usually normal,"

Complicated deliveries represent a higher risk to the child of suffering spinal cord damage during the birth process. High cervical spinal cord injury in neonates is a specific complication of forceps rotation. The vacuum extractor exerts considerable traction force. Fetal skull fracture can result, and its true incidence may be higher than expected, considering that few neonates with normal neurologic behavior undergo skull x-ray. Byers(8) published an excellent review paper addressing spinal cord damage during the birth process. Traction and rotational stresses applied to the spinal axis were listed as causes of spinal cord injury during birth. The vagus nerve is involved in mechanisms associated with control of tidal volume, breathing rate, and respiratory reflexes. Sachs et al(9) performed histological examinations of the vagus nerve in infants who died of SIDS and those who died of other conditions. Significant differences were noted between the two groups. Several hypotheses were proposed by authors to explain the data, including damage to the vagus nerve resulting in delayed development.

Gutman(10) described how "relational disturbance" between occiput and atlas can lead to "blocked atlantal nerve syndrome" in children and adults. The author listed a variety of conditions which appear clinically related to this syndrome. Although SIDS was not discussed as an entity, the author stated that a brain stem component is a part of this syndrome. It was concluded that for those affected, "manual treatment" by a qualified practitioner is appropriate.

In her paper "Physical stresses of childhood that could lead to need for chiropractic care," presented at the first National Conference on Chiropractic and Pediatrics, McMullen(11) stated, "Any condition that arises to change the normal birth process... frequently results in subluxation at the level of greatest stress. Severe subluxation resulting in nerve damage may be clinically obvious at birth (e.g., Bell's, Erb's and Klumpke's palsies), however, more frequently the trauma remains subclinical with symptoms arising at a later time. These symptoms include, but are not limited to, irritability, colic, failure-to-thrive syndromes, and those syndromes associated with lowered immune responses. These subluxations should be analyzed and corrected as soon as possible after birth to prevent these associated conditions."

Bonci and Wynne(12) and Stiga(13) published papers discussing the relationship between chiropractic theory and SIDS etiology. Banks et al.(14) stated "Functional disturbances in the brainstem and cervical spinal cord areas related to the neurophysiology of respiration may contribute the clinical factors associated with sudden infant death syndrome...Any process, whether genetic, biochemical, biomechanical or traumatic, that alters normal development of the respiratory control centers related to spinal constriction and compression following birth trauma may be contributory to sudden infant death syndrome."

Other traumatic events of childhood may produce vertebral subluxations. Orenstein et al(15) did a retrospective chart review involving 73 children who presented at a children's hospital with cervical spine injuries. Sixty-seven percent of these injuries were traffic related resulting from motor-vehicle crashes. The injured children were passengers in an automobile, pedestrians, or bicyclists. The mean age of the patients surveyed was 8.6 years, with bimodal peaks at 2 to 4 and 12 to 15 years. The authors noted that younger children sustained more severe injuries than older children. Distraction and subluxation injuries were the most common injuries in children aged 8 years and younger. Fractures were more common in older children.

Glass et al.(16) evaluated 35 children with lumbar spine injuries following blunt trauma. Thirty-one of these children were injured in motor-vehicle crashes. Abnormalities noted on plain radiographs and CT scans included subluxation, distraction, and fracture alone or in combination. The authors stated, "Children involved in motor-vehicle crashes are at a high risk for lumbar spine injuries... Lumbar spine radiographs are necessary in all cases with suspected lumbar spine injury. . ." This paper underscores the need to evaluate the entire spine in cases of motor-vehicle accidents, not just the cervical region. It may be cited when claims for lumbar radiographs are questioned in cases of children involved in car accidents.

Rachesky et al(17) reported that on the cervical spine radiographs of children under 18 they examined, vehicular accidents accounted for 36% of radiographic abnormalities. It was further stated that clinical assessment of a complaint of neck pain or

involvement in a vehicular accident with head trauma would have identified all cases of cervical spine injury.

Other authors have described aspects of cervical spine injuries in children involved in motor-vehicle accidents. Hill et al.¹⁸¹ noted that 31 % of the pediatric neck injuries reviewed were the result of motor-vehicle accidents. In younger children (under 8 years of age) subluxation was seen more frequently than fracture. Agran¹⁹¹ stated that non-crash vehicular events may cause injuries to children. Noncrash events discussed in this paper included sudden stops, swerves, turns, and movement of unrestrained children in the vehicle.

Roberts et al.²⁰¹ described a case where a child involved in a motor-vehicle accident sustained a "whiplash" injury resulting in immediate neck and back pain. Neurobehavioral abnormalities increased in the two-year period following the accident. Four years after the accident, symptoms persisted. Position emission tomography (PET scan) demonstrated evidence of brain dysfunction. The clinical manifestations of pediatric cervical spine injury may be diverse. Biedermann²¹ stated that a wide range of pediatric symptomatology may result from suboccipital strain. The disorders reported include fever of unknown origin, loss of appetite, sleeping disorders, asymmetric motor patterns, and alterations of posture. Maignet²² stated that trauma to the cervical spine and head can cause such problems as headaches, vestibular troubles, auditory problems and psychic disturbances. Gutmann²³ discussed the diverse array of signs and symptoms which can occur as a result of biomechanical dysfunction in the cervical spine. Others have also reported various pathoneurophysiological changes in children,²⁴⁻³¹ as well as reduction of pathology following chiropractic care.^{29,31-41,44} In the chiropractic literature, Clow⁴² published a paper addressing pediatric cervical acceleration/deceleration injuries.

Two peer reviewed journals, Chiropractic Pediatrics and the Journal of Clinical Chiropractic Pediatrics are being published to disseminate critically reviewed papers in this field. Additionally, courses in pediatrics are offered at the professional and postgraduate levels at accredited chiropractic colleges and by the International Chiropractic Pediatric Association.

The pediatric case history and physical examination necessarily differ in content and scope from those of adult patients. Even taking into consideration the difference between the two populations, however, a recent quasi meta-analysis reveals an extremely low risk for chiropractic pediatric patients receiving adjustments.⁽⁴³⁾

**Our purpose is to educate and adjust families toward optimal health
with natural chiropractic care.**