

# New study possibly links cognitive and motor delays with 'flat head syndrome' in young babies

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In a new study, infants averaging six months of age who exhibited positional plagiocephaly (flat head syndrome) had lower scores than typical infants in observational tests used to evaluate cognitive and motor development. Positional or deformational plagiocephaly may occur when external forces shape an infant's skull while it is still soft and malleable, such as extended time spent lying on a hard surface or in one position.

This is the first controlled study to suggest that babies who have flattened areas on the back of their heads during the first year of life may be at risk for developmental delay. Led by clinical psychologist Matthew L. Speltz, PhD, from Seattle Children's Research Institute, these findings suggest that babies with plagiocephaly should be screened early in life for possible motor and cognitive delays. "Case-Control Study of Neurodevelopment in Deformational Plagiocephaly" published online on February 15 in *Pediatrics*.

"Developmental plagiocephaly seems to be associated with early neurodevelopmental disadvantage, which was most evident when testing motor skills," said Matthew L. Speltz, PhD, chief of outpatient psychiatric services at Seattle Children's Hospital and professor of psychiatry and behavioral sciences at the University of Washington School of Medicine. "This suggests that babies with flat head syndrome should be screened and monitored for possible cognitive and motor delays. However, it's also important to note that our study examined

babies at one particular point in time, so we cannot say with certainty whether these observations continue to hold true as these infants grow older. Our future studies will re-visit this population at 18 and 36 months of age, to see whether this association persists as these infants mature."

"Statistically, there has been a dramatic rise in the diagnosis of positional plagiocephaly since the 1990's. This may be a result of multiple factors, including increased awareness and babies spending more time on their backs in strollers, car seats, infant seats, cribs and sleeping on their backs. This time period also coincides with the national Back-to-Sleep campaign designed to help protect babies against Sudden Infant Death Syndrome (SIDS), although it should be noted that a direct correlation with flat head syndrome hasn't been scientifically established," added Speltz. "For every ten babies, one or two may have at least mild plagiocephaly. Many parents and physicians have dismissed it as a cosmetic issue or one that babies will grow out of as they develop, but our study indicates that we should look deeper."

In the study, 472 babies with ages ranging from four to 12 months (average age six months) were screened for cognitive and motor development using the Bayley Scales of Infant Development III (BSID-III), a series of industry standard observational tests. These common tests observe babies for basic cognitive, language and motor skill development. During the BSID-III, trained examiners present a series of standardized test materials to the child and observe their responses to simple tasks that require problem-solving and memory, such as searching for a hidden toy, as well as the ability to imitate, vocalize, observe and respond to their environment. Infant motor skills like crawling, rolling from side to side, and being able to lift up from a tummy position are also observed and measured. Half of the babies in the study had exhibited and been diagnosed at the Seattle Children's Hospital Craniofacial Center with some level of flat head syndrome, while half were a "normal" control group.

For the study, cranial images and measurements of each baby's head shape and size were also obtained using a 12-camera, 3-D system that allows for 360o imaging of the head. The study found that those babies who exhibited some degree of flatness at the back of the head were more likely to perform worse on the BSID-III, by an average of 10 points for the motor test scale. The most significant lower scores showed in large muscle motor functions, such as rolling from back to side.

Though the findings indicated an association between flat head syndrome and developmental delay, they do not indicate a direct causal link, the researchers say. There may be a reverse correlation, if, for example, babies with pre-existing motor delays are more likely to end up with flatter heads because they may move less or remain in one stationary position for longer periods of time.

"Physicians, psychologists and parents all need to know that it remains very important for babies to continue sleeping on their backs," added Speltz. "Regardless of any suggestion of plagiocephaly or [developmental delay](#), the safest way for babies to sleep still aligns with the Back-to-Sleep campaign's recommendations to help prevent SIDS."

Provided by Seattle Children's

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