

Association between transient newborn hypoglycemia, 4th grade achievement

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A study matching newborn glucose concentration screening results with fourth-grade achievement test scores suggests that early transient newborn hypoglycemia (low blood sugar) was associated with lower test scores at age 10, according to an article published online by *JAMA Pediatrics*.

At birth, the continuous utero-placental-umbilical infusion of glucose ends and reaches the lowest values during the first couple of hours. The newborn brain principally uses glucose for energy and prolonged [hypoglycemia](#) has been associated with poor long-term neurodevelopment and neurocognition. However, less is known about whether early transient hypoglycemia, frequently considered to be a normal physiological phenomenon with no serious consequences, is associated with cognitive impairment. Early transient hypoglycemia is defined as occurring within the first three hours of life and it involves a single low [glucose concentration](#) followed by a second value above a cutoff, according to the study background.

Jeffrey R. Kaiser, M.D., M.A., of the Baylor College of Medicine, Houston, and coauthors conducted a study of all infants born in 1998 at the University of Arkansas for Medical Sciences who had at least one recorded glucose concentration. Medical record data from newborns with normoglycemia (normal blood sugar levels) or transient hypoglycemia were matched with their student [achievement tests](#) in 2008 when they were 10 years old and in the fourth grade.

The authors matched 1,395 of 1,943 newborns (71.8 percent) having normoglycemia or transient hypoglycemia with their achievement tests. Most of the newborns were full term and late preterm. Overall, 94.7 percent of the newborns were black or white and 50.3 percent were male.

Transient newborn hypoglycemia (glucose level less than 35, less than 40 and less than 45 mg/dL) was seen in 6.4 percent, 10.3 percent and 19.3 percent of infants, respectively.

Early transient hypoglycemia was associated with decreased probability of proficiency on literacy and mathematics fourth-grade achievement tests. According to the study, the average fourth-grade literacy test score and proficiency rate were 544 and 32 percent for hypoglycemic (less than 35 mg/dL) newborns vs. 583 and 57 percent for normoglycemic (greater than or equal to 35 mg/dL). The average mathematics test score and proficiency rate were 562 and 46 percent for hypoglycemic newborns vs. 589 and 64 percent for normoglycemic [newborns](#).

The authors noted limitations in their study, including the observational nature of the data, which cannot prove causality.

"While our study did not prove that transient newborn hypoglycemia causes poor academic performance, we believe that the findings raise legitimate concerns that need to be further investigated in other newborn cohorts. Until our results are validated, however, universal newborn [glucose](#) screening should not be adopted. High-quality long-term follow-up studies are needed to direct future newborn hypoglycemia screening and treatment guidelines," the study concludes.

In a related editorial, Christopher J. D. McKinlay, M.B.Ch.,B, Ph.D., and Jane E. Harding, M.B.Ch.,B., D.Phil., of the University of Auckland, New Zealand, write: "There are many challenges and

unanswered questions surrounding the glycemic management of newborn infants. The opportunity to improve real-life outcomes through simple treatment or to reduce needless intervention and health care costs may be great. However, only well-designed RCTs (randomized clinical trials) and time (with detailed follow-up) will tell."

More information: *JAMA Pediatr.* Published online August 24, 2015. [DOI: 10.1001/jamapediatrics.2015.1631](https://doi.org/10.1001/jamapediatrics.2015.1631)

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