Study shows impact of vitamin D, thyroid hormones on child development

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Prenatal exposure to altered levels of vitamin D and/or thyroid hormones has the potential to impact child development long after birth, according to a new study by researchers at the Marshall University Joan C.

Edwards School of Medicine.

A retrospective study analyzed the presence of 20 different elements, thyroid hormones and vitamin D levels in umbilical cord blood collected at birth. The levels were compared with how well a child met developmental milestones as part of their well child examinations conducted between birth to age 5.

The findings, published in *Biomedicine & Pharmacotherapy*, showed that vitamin D levels were associated with a delay in fine motor development and thyroid hormone levels were associated with cognitive development. Certain metals such as lead, mercury, copper and manganese were associated with language, cognitive or motor skill development.

"Our study demonstrates the importance of the in-utero environment," said Jesse Cottrell, M.D., assistant professor of obstetrics and gynecology at the Joan C. Edwards School of Medicine and lead author on the study. "The study found multiple associations between umbilical cord essential and toxic elements, thyroid levels and Vitamin D on childhood development for a pronounced time after birth."

"Very little existing research addresses the long-term effects on child development of in utero exposure to environmental agents," said Monica Valentovic, Ph.D., professor of biomedical sciences and toxicology research cluster coordinator at the Joan C. Edwards School of Medicine and corresponding author on the study. "With the original umbilical cord blood samples collected in 2013, having long-term follow-up on developmental outcomes adds significantly to the literature."

The team continues to investigate development of children beyond age 5 as well as in utero exposure to environmental metals and the impact on development of the newborn or health effects related to vitamin D levels.

More information: Jesse Cottrell et al, Effect of umbilical cord essential and toxic elements, thyroid levels, and Vitamin D on childhood development, *Biomedicine & Pharmacotherapy* (2022). DOI: 10.1016/j.biopha.2022.114085

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