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ASIAN BIOMEDICINE

Editorial

Short- and long-term effects of maternal anemia and iron deficiency on outcomes of children under five

The United Nations Sustainable Development Goals provide a unique opportunity to implement interventions to promote early childhood development [1]. The important factors contributing to this issue are thought to include infection and inflammation, nutrition, and quality of care, especially during pregnancy and in the first 2 years of life [2]. Recently, maternal health status and brain development of the children have become a new and interesting subject [3]. A recent study suggested that maternal anemia showed no significant short-term effect on neonatal habituation, orientation, motor maturity, or gross motor function. However, the authors proposed that future studies should assess long-term neurodevelopment to clarify potential delayed effects and refine treatment approaches [4]. A study from 2025 also demonstrated no significant impairments in newborns' Apgar scores or archaic reflexes [5].

However, in a large Swedish study with long-term follow-up, it was documented that anemia diagnosed within the first 30 weeks of pregnancy was associated with increased risks of the development of autism spectrum disorder, attention-deficit/hyperactivity disorder, and intellectual disability in children. Given that iron deficiency and anemia are common among women of childbearing age, the findings emphasize the importance of early screening for iron status and nutritional counseling in antenatal care [6]. Also, recent evidence suggests that maternal nonanemic iron deficiency during early pregnancy gave rise to neonatal low iron status at birth in addition to inferior language and motor skills at 2 years of age [7]. Therefore, the evidence indicates that health providers should screen for iron deficiency in early pregnancy because the timing of iron deficiency during pregnancy may significantly matter. Iron is an important building block of brain myelin, neurotransmitter synthesis, and function. Iron is important for oligodendrocyte development, energy metabolism, and oxygen transport, including brain energy. Iron is vital for cognition. Iron deficiency may result in impaired genesis of myelin and irreversible neurological deficits [8].

In this issue, He F. and Liu C. reported "The influence of maternal anemia on neonatal neurodevelopment: a systematic review and meta-analysis" [9]. Their analysis illustrated that maternal anemia does not significantly impact early neonatal neurodevelopment. They also cautioned that while additional studies are unlikely to reveal meaningful effects during the neonatal period, the potential for delayed or long-term neurodevelopmental impacts remains uncertain and warrants further longitudinal research.

Given the existing longer-term follow-up studies [6–8], and the studies on non-anemic iron deficiency during early pregnancy and the importance of iron on the development of the neural system, detection of iron deficiency in early pregnancy might be an important piece of advice.

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