

Clinical Pearl: Does Zinc Supplementation Improve Growth and Neurodevelopmental Outcomes in Preterm Infants?

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“The baby was on full enteral feeds and developed hair loss and diarrhea, which bothered the medical team as much as it did him. Luckily, my attending considered zinc deficiency. With supplementation, there was a significant clinical improvement, including resolution of both diarrhea and hair growth.”

I first encountered zinc deficiency in a preterm infant in 1978 during my neonatal intensive care unit rotation at Prentice Women's Hospital. The baby was on full enteral feeds and developed hair loss and diarrhea, which bothered the medical team as much as it did him. Luckily, my attending considered zinc deficiency. With supplementation, there was a significant clinical improvement, including resolution of both diarrhea and hair growth.

“Preterm infants only absorb 20-35% of enteral zinc supplements (1,2). Zinc plays a distinctive role in growth via gene transcription, macronutrient metabolism, and hormonal activity (1). As with many nutrients, fetal zinc accretion occurs for the most part after 24 weeks gestation (1). Zinc is also vital in protein synthesis (1).”

I recently read an excellent meta-analysis article about the “effect of enteral zinc supplementation on growth and neurodevelopment of preterm infants: a systematic review and meta-analysis” by Alshaikh and colleagues (1). The authors noted that preterm infants have low body stores and increased GI and renal zinc losses. The high demand for zinc exacerbates the deficiency due to high

growth velocity (1). Preterm infants only absorb 20-35% of enteral zinc supplements (1,2). Zinc plays a distinctive role in growth via gene transcription, macronutrient metabolism, and hormonal activity (1). As with many nutrients, fetal zinc accretion occurs for the most part after 24 weeks gestation (1). Zinc is also vital in protein synthesis (1).

In the eight randomized-controlled trials in the systematic review, which included 742 infants, seven studies reported anthropomorphic studies at 3-6 months of corrected age (1). Two studies reported neurodevelopmental outcomes at 6-12 months corrected age (1). The level of certainty for improved length and weight is moderate, whereas for improved head circumference and neurodevelopmental outcome, it was determined to be very low certainty (1).

“A common phrase we hear on rounds is “Feed the baby!” but research in our field should serve as the compass guiding not only what we feed preterm infants but also how much, ensuring that their nutritional needs are met optimally. This entails a comprehensive understanding of the nuanced interplay between various nutrients and their roles in supporting the fragile growth and development of these vulnerable infants.”

It will be essential to continue examining infant outcomes as zinc supplementation becomes more common in the neonatal intensive care unit. A common phrase we hear on rounds is “Feed the baby!” but research in our field should serve as the compass guiding not only what we feed preterm infants but also how much, ensuring that their nutritional needs are met optimally. This entails a comprehensive understanding of the nuanced interplay between various nutrients and their roles in supporting the fragile growth and development of these vulnerable infants.

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1. Alshaikh B, Zeed MA, Yusuf K et al. Effect of enteral zinc supplementation on growth and neurodevelopment of pre-

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2. Wastney ME, Angelus PA, Barnes RM, et al. Zinc absorption, distribution, excretion, and retention by healthy preterm infants. Ped REs 1999;45:191-196.

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