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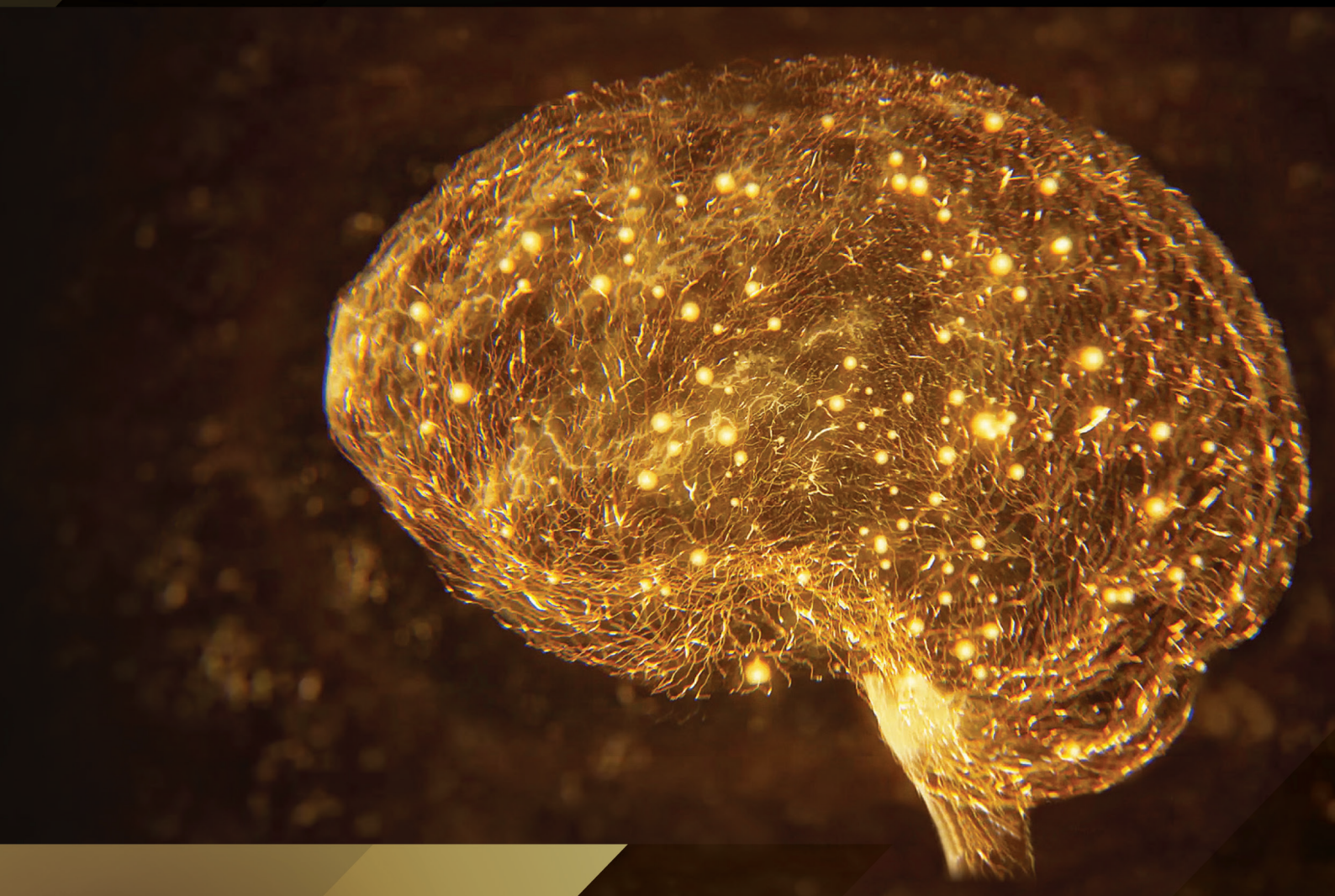

THE MYELIN NUTRIENT BLEND:

A Step Towards Optimizing Cognitive Potential in Infants

From birth to around age five, the early years of life represent a critical window for brain development. During this period, billions of connections are established between neurons across different brain regions, forming the complex architecture that underpins all cognitive functions.[1] Myelination, the process of insulating nerve fibres with a fatty sheath called myelin, is crucial in optimizing these connections, enabling faster and more efficient communication between neurons. This in turn lays the foundation for higher-order cognitive skills like learning, memory, and language and social-emotional development.[2-9]

Recent research suggests that the course of early brain development, particularly myelination, may be influenced by specific nutrients. This article explores the findings of a randomized controlled trial (RCT) investigating the potential benefits of a dietary intervention with a "myelin nutrient blend" in enhancing brain development – particularly the process of myelination – in young children.

Impact on myelination in the first 6 months

This RCT, first published in Frontiers in Nutrition (2022), focused on the impact of a myelin nutrient blend on brain development in the first six months of life. The prospective, longitudinal, double-blind, parallel-group study randomized eligible non-breastfed infants to receive either an investigational (n=39) or a control formula (n=42) from enrolment until 12 months of life.[10] In addition, non-randomized breastfed children (n=108) served as a natural reference group.

The investigational products were bovine milk-based infant formula. The alpha-lactalbumin enriched whey protein concentrate used for the control product was almost devoid of phospholipids and sphingomyelin (SM), while the alpha-lactalbumin enriched whey protein concentrate used in the investigational product contained higher levels of SM and phospholipids. The investigational formula also contained higher levels of DHA, ARA, iron (fortified through ferrous sulfate heptahydrate), folic acid, and vitamin B12 (fortified through cyanocobalamine) than the control formula.

The study revealed that infants who received the myelin nutrient blend demonstrated significantly greater myelin volume in key brain regions compared to the control group (Figure 1). Specifically, at 3 months, they showed higher myelin volume in the whole brain, parietal, and temporal lobes.

By 6 months, they also exhibited increased myelin volume in the cerebellum and occipital lobe. These regions of the brain are associated with sensory, motor, cognitive, and language functions, including inhibitory control, head-eye coordination, grasping, and hand-to-hand transfer, which typically manifest at around 6 months of age.[4,11-12]

While no statistically significant differences in early cognitive and behavioural scores were observed, these initial findings suggested a potential link between the myelin nutrient blend and enhanced myelination.

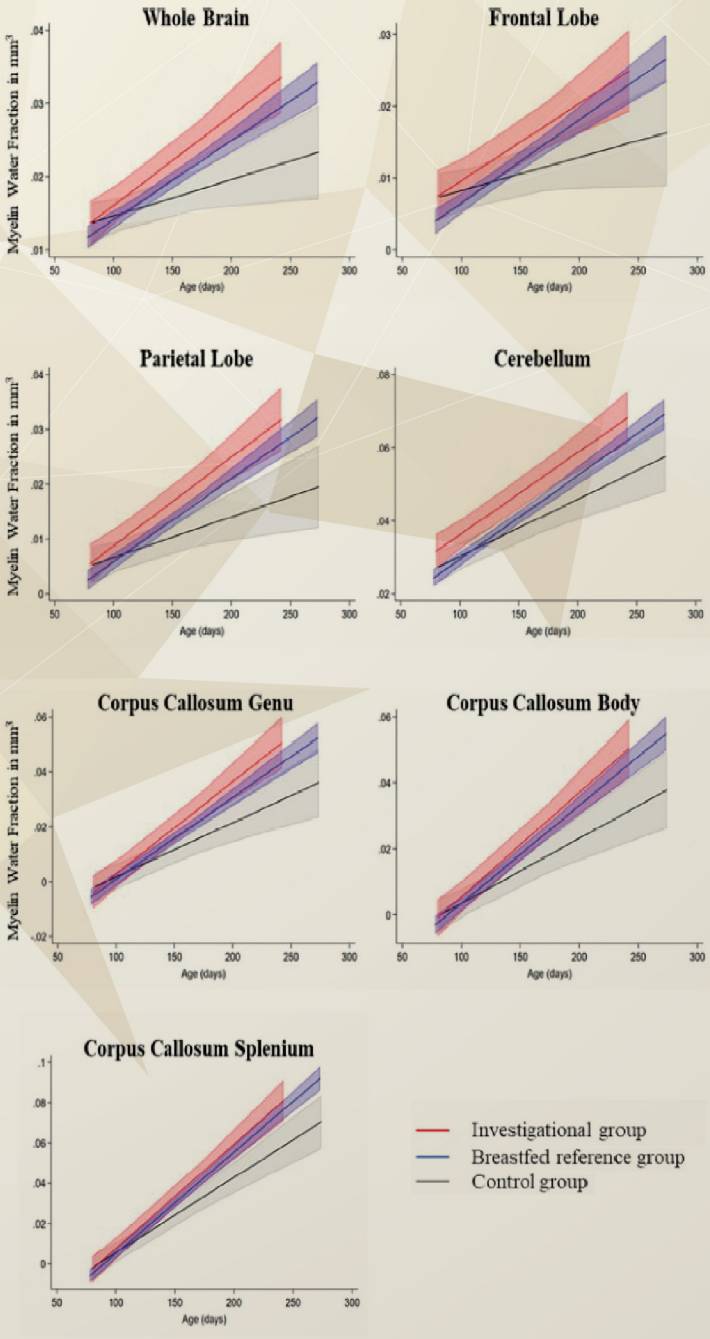

Figure 1. Myelin growth rates for the investigational, control and breastfed reference groups. Adapted from Schneider, N, et al. (2022).[10]

Longitudinal effects on brain development

Building upon this study, the research group extended the investigation to assess the longer-term effect of the myelin nutrient blend on brain development up to 2 years of age.[13] The reported study outcomes included a broad range of assessments, including MRI scans for myelination throughout the study period, neurodevelopmental assessments, and social-emotional and behavioural evaluations.

Infants who received the myelin nutrient blend demonstrated significantly higher myelination all assessed ages, exceeding the control group at 12, 18 and 24 months.[13] Beyond myelination, these infants also exhibited increased gray matter volume at age 2 years, improved sleep patterns (less night awakenings at 6 months and more day sleep at 12 months, Figure 2), and reduced social fearfulness at 24 months. While overall cognitive development did not show significant differences during the study period, the observed improvements in various domains suggest potential lasting benefits of the intervention.

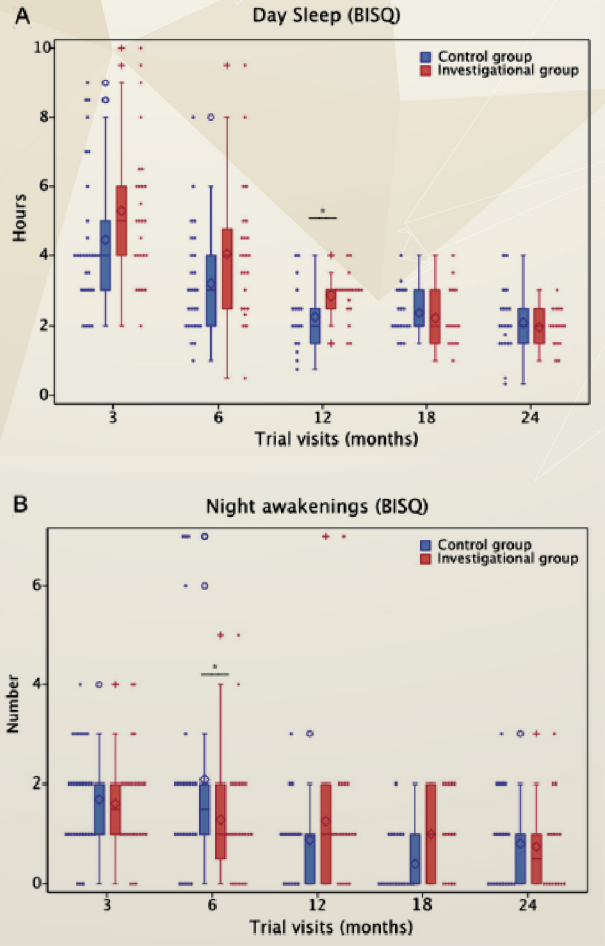

*Figure 2. Boxplots for day sleep hours (A) and number of night awakenings (B), as assessed using the Brief Infant Sleep Questionnaire (BISQ). Diamonds represent the mean and horizontal lines, the quartiles. Whiskers represent minimum and maximum observations within 1.5 times the interquartile range above and below the box. Dots and Crosses represent individual values. *p≤0.05. Adapted from Schneider N, et al. (2023).*[13]

Conclusion

Overall, these findings suggest that targeted nutritional interventions could optimize brain development in the early years, potentially positively impacting cognitive and behavioural outcomes later in life. Further research with larger, more diverse populations, longer follow-up periods, and detailed cognitive assessments is needed to fully understand the long-term impact of the myelin nutrient blend on childhood development.

The Myelin Nutrient Blend: A Step Towards Optimizing Cognitive Potential in Infants

- Infants who received the myelin nutrient blend demonstrated significantly greater myelin volume in key brain regions compared to the control group. At 3 months, they showed higher myelin volume in the whole brain, parietal, and temporal lobes. By 6 months, they also exhibited increased myelin volume in the cerebellum and occipital lobe.

- No statistically significant differences in early cognitive and behavioural scores were observed at 6 months.

- These infants continued to demonstrate significantly higher myelination than those in the control group at 12, 18 and 24 months. Additionally, these infants also exhibited increased gray matter volume at age 2 years, improved sleep patterns (less night awakenings at 6 months and more day sleep at 12 months, and reduced social fearfulness at 24 months.

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