CHRD 2024: Abstract Submission Form

Presenter Name
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Presenter Status
PhD Student

Role in the project
Design
Analyze Data
Write Abstract

Research Category
Community Health / Policy

Title
Human Milk Oligosaccharides and Cognitive, Language and Motor Development at One Year in the CHILD Cohort Study

Background
Human milk oligosaccharides (HMOs) are complex sugar molecules found in human milk. Emerging research has linked some HMOs to improved neurodevelopment in animal and human studies, but these relationships remain unclear.

Objective
The objective of this research is to examine the link between 19 HMOs and neurodevelopment at one year of age.

Methods
This study includes a subset of 247 parent-infant pairs from the Canadian CHILD cohort study. At 3-4 months post-partum, breastfeeding parents provided a milk sample which was analyzed by liquid chromatography to identify the 19 most prevalent HMOs. Trained research assistants administered the Bayley Scale of Infant and Toddler Development at one year of age which comprised three scales: cognitive, language and motor development (standardized to a mean of 100 and a standard deviation of 15; higher scores indicate better development). Adjusted linear regression was used to estimate the relationship between HMOs and neurodevelopment, controlling for maternal, infant and birth factors. Interactions were tested with infant sex as well as maternal secretor status, a genetic predictor of HMO production.

Results
Higher concentrations of the HMOs 3'-sialyllactose (3'SL) and lacto-N-hexaose (LNH) were related to better language and cognitive scores, respectively (β= 2.09; 95% CI: 0.61, 3.58; β= 2.10; 95% CI: 0.77, 3.43). Higher concentrations of disialyllacto-N-tetraose (DSLNT) were related to lower cognitive, language and motor scores (β= -1.50, -2.15 and -4.00, respectively, all $p \leq 0.05$). In interaction models, higher concentrations of 3'SL were related to better language and motor scores for infants of maternal secretors and lower scores for infants of maternal non-secretors. The opposite was true for difucosyllactose-N-hexaose (DFLNH); higher concentrations were related to better language and motor scores for maternal non-secretors and lower scores for secretors. Few sex interactions were observed.

Conclusion
This exploratory study contributes to a growing evidence base that select HMOs are related to infant neurodevelopment. Maternal secretor status may play an important role in moderating the relationship between HMOs and neurodevelopment; however, the direction of these effects are not consistent (i.e. higher concentrations and positive secretor status is not always better). More work is needed before translation into practice can occur.

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No

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