Infant brain-boosting sugar molecule found in breast milk: Study



Myo-inositol is a small cyclic sugar molecule present in breast milk Photograph:(Twitter)

They found that the sugar molecule enhanced synapse abundance in neurons and promoted improved neuronal connectivity.

Breast milk is not just a source of nourishment for infants but also contains essential micronutrients crucial for healthy brain development. Recently, researchers made a significant finding about a specific component in breast milk, Myo-inositol, which plays a key role in promoting the formation of neural connections in the brains of infants.

This finding highlights the impact of dietary choices on brain function and underscores the importance of understanding breast milk's complexity beyond its nutritional value.

Myo-inositol is a small cyclic sugar molecule present in breast milk, commonly found in typical adult diets, including fruits and grains.

A study published in PNAS on July 11, 2023 highlights the role of Myo-inositol in supporting the development of neural connections in infants' brains.

The effects of micronutrients on the brain

"The effects of micronutrients on the brain are really under-appreciated," says Thomas Biederer, PhD, associate professor of neurology and principal investigator. "As a neuroscientist, our findings were stunning to me."

Previous research has indicated that breast milk positively influences infants' cognitive development, but the underlying reasons were not well understood. Some scientists speculated that breast milk contains unidentified components responsible for these benefits.

The research provides crucial insights into how breast milk's bioactive compounds support the infant brain's developmental processes.

The study's starting point was an analysis of breast milk samples donated by mothers from diverse geographical locations, including Cincinnati, Mexico City, and Shanghai, collected over the lactation period.

The researchers hypothesised that certain micronutrients present consistently across all samples, irrespective of diet, race, or location, might have significant biological significance.

They were particularly interested in identifying components that showed consistent changes throughout lactation.

Myo-inositol's role in neural connectivity

The researchers observed that Myo-inositol was present in high concentrations in all breast milk samples during early lactation and gradually decreased over time. Interestingly, this pattern remained consistent across all three locations. "The molecule is very robustly controlled by the mother," says Biederer.

To understand its impact on brain development, the team studied the effects of Myo-inositol using various models, including cultured human neurons and brain tissue.

They found that the sugar molecule enhanced synapse abundance in neurons and promoted improved neuronal connectivity.

The value of breast milk

The study's findings highlight the significant value of breast milk in supporting the formation of connections in an infant's brain. "Our study demonstrates that breast milk is extremely valuable in how mothers can support the formation of connections in an infant's brain," says Biederer. "It truly shows the importance of valuing the complexity of breast milk. It's not just a source of calories, but an extremely rich, complex biofluid, and the mother's body is really attuned to changing the composition of breast milk to match what the infant needs at different stages of development." While the current study focused on the initial formation of connections in the brain during the first months after birth, the brain subsequently refines and optimises these connections. Future research by Biederer aims to investigate how breast milk supports infants during this later stage of development, as refinement is a critical process in establishing the right patterns in the brain. **-**www.wionews.com, July 30, 2023