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# The Influence of Gut Microbiome Derived Neurotransmitters on Neonatal Immune Response

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The complex interaction between neurotransmitter, gut flora and immune system has expanded dramatically. Infant gut microbiome is a key driver of immune system development [1]. Any disruption in gut microbiota during early life have been associated with childhood disorders such as food allergies, neurodevelopmental disorders and asthma [2].The bacteria in guts are not just inert inhabitants of our digestive systems. Their metabolic activities involve the active creation of neurotransmitters such as GABA, dopamine, and serotonin. Gut is known as second brain because it produces 90% of neurotransmitters including dopamine and serotonin [3]. In adults, neurotransmitters are produced by enterochromaffin cells but in infants there is need to unveil the regulation of neurotransmitters. Some of the studies have shown the relationship between gut flora and immune system.

Neonates are more susceptible to diseases because their gut is not mature enough to produce neurotransmitters. Some specific gut microbiome in infants produce serotonin which activates the T-regulatory cells (Tregs). Tregs act as a defence mechanism against autoimmune disorders and food allergic reactions. The number of serotonin producing neonatal gut flora can be influenced by diets, availability of antibiotics and reduce exposure of microbes in their environment. Any change in level of serotonin might affect the development of Tregs. The reason that makes infant more prone to allergic reactions and autoimmune disorders in developed countries.

Scientists are trying to dig out about how gut bacteria in human newborn samples, produce serotonin. This research could lead to the development of effective immune system training techniques, which would lower the lifetime risk of inflammatory illnesses like allergies and inflammatory bowel disease. This work highlights the importance of gut microbes in developing immunity in infancy and provides opportunities for further studies targeted at reducing immune-related illnesses. Interventions that support healthier immune responses from infancy through maturity may be made possible by better understanding and utilizing the power of gut flora.

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