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The brain and microbial flora: Role of gut microbiota in the gut-brain axis

The human gut host 10^{14} bacterial organisms, an amount that exceeds the cells within the body. Microbiota is the bacteria living both inside and on the human body (a community collectively known as, dwelling in the human microbiome) mostly are friendly; outnumber the somatic and germ cells of the body by a factor of 10. Specific to the human gut is the commensal microflora, enters into an important symbiotic association with the human host beginning with the colonization of the Gastrointestinal (GI) tract by the bacteria within half an hour after delivery and continue to develop depending on many factors, this is developmental process begins at birth, continues through early development and remains for life. This developmental processing is actually acted during vulnerable or sensitive developmental periods and thus exerts influences that impact on the structure and function of organs (brain) that last throughout life. However, although the colonization of microbiota is due to postnatal environmental factors and is also affected by genetics, it is consistent and is difficult to change after reaching the adult form. It has a pre and post natal effect on developing infant brain. The microbiota is essential to the proper development of the mucosal and systemic immune systems and in nutrient uptake and metabolism as an important contributor in making the individual's physiology and influence the function of the central nervous system (CNS) and behavior. Of particular interest is the impact on the functional development of the infant (mammalian) brain. The developing brain is susceptible to internal and external cues during its perinatal life, an important point when considering the association between common neurodevelopmental disorders (e.g. autism, schizophrenia) and microbial pathogen infections during this same period. Breast feeding and probiotics now being recognized in the brain-gut axis interactions.

Biography

Aziz Koleilat is currently working as a Vice General Secretary, Pashan Pan Arab Society Pediatric Gastroenterology Hepatology and Senior Pediatric Consultant Gastroenterology and also Asthma IBR Member Makassed General Hospital, Lebanon.