



Microbial Dysbiosis in Diabetic Children with Enteric Hepatitis: The Global Phenomenon and Bangladesh's Contextual Significance



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The modern world is beset with many health problems, and among the diversity of problems, the rise of complicated health diseases among the younger population is especially concerning. The severity of the current healthcare crisis is shown by the fact that the prevalence of illnesses like paediatric diabetes is on the rise, while other conditions, such as enteric hepatitis, are making a comeback at the same time ¹. When we turn our attention to countries such as Bangladesh, we see that this complicated network of health issues takes on deeper shades of complexity. When seen in this light, the microbiome's function, which is defined as the broad and varied community of bacteria found in the gut, takes on an increasingly important role. This intricate network of bacteria has come to be recognized for the crucial roles it plays in the coordination of our metabolic processes, the fortification of our immunological defences, and even the modulation of our brain pathways as the discussion about health has developed for the last few years. However, the development of imbalances in this ecosystem, a process that is referred to as "dysbiosis," may set the stage for a wide variety of diseases. Among them, diabetes stands out as a particularly concerning condition due to the chronic implications it may have and the many health complications it might cause².

Overview: In the complex web of human physiology, the "gut-liver axis" stands out as a central link, highlighting the essential relationship between our digestive system and the liver's many roles³. More than just describing a correlation between two physiological factors, this phrase

encompasses the intricate web of relationships that serves as the structural underpinning of our well-being⁴. Since the liver is the metabolic system's first line of defence, the two systems' symbiotic interaction is critical. The gut is inhabited by a wide range of microbes, making its interior environment extremely sensitive. However, microbial dysbiosis, which occurs when this balance is upset, has far-reaching consequences⁵. The development of diseases like enteric hepatitis is a prominent effect of this imbalance. This liver disease is strongly linked to the condition of the digestive tract, and its onset may indicate significant shifts in the relationship between the stomach and the liver. Not only that, but it sets off yet another chain reaction. Changes in the communication between the stomach and the liver may have far-reaching effects on glucose homeostasis, a key metabolic function that affects diabetes treatment and progression⁶. The complexity of illness and the value of taking a systems-level view of health have become more apparent as our knowledge of these systems has expanded.

Significance in the Context of Bangladesh: Bangladesh, with an intricate tapestry of genetic variety, environmental influences, and socio-cultural subtleties, becomes a crucible where global health trends frequently find their reflections. This is because Bangladesh is home to a large population of people from many backgrounds. In light of the fact that this country is at a crossroads in terms of healthcare issues, its health tales serve as a mirror for international tendencies while also preserving its local individuality. In the past, infectious illnesses

such as tuberculosis and cholera were the primary challenges that Bangladesh faced, just as they were for a great number of other poor nations. Nevertheless, there has been a discernible movement in perspective during the last several decades. Although infectious illnesses such as enteric hepatitis is still a cause for worry, a growing number of people are being diagnosed with non-communicable diseases like paediatric diabetes.

According to the International Diabetes Federation (IDF), Bangladesh has more than 8 million persons suffering with diabetes in 2018, a major portion of them were children and adolescents⁷. The presence of both diabetes and enteric hepatitis, which is often brought on by drinking tainted water or consuming food that is infected with microorganisms, provides a multifaceted challenge to one's health⁸. On the one hand, the growth of urbanisation in the nation as a whole and the shift towards unhealthier lifestyles are factors that contribute to the increase in metabolic diseases. On the other hand, improper water sanitation and hygiene practises create an environment that is conducive to the spread of infectious diseases⁹.

Global Implications of the Changing Health Landscape in Bangladesh: The path that Bangladesh has taken to improve its health provides vital lessons for the rest of the world. It exemplifies how infectious illnesses and non-infectious diseases work together to co-create national health narratives, which is an important aspect to keep in mind. The finding of microbial dysbiosis in diabetic children who also have enteric hepatitis provides more insight into this connection. Diabetes and hepatitis may both be made worse by a condition known as dysbiosis, which has the ability to be impacted by both genetic variables that are unique to the Bangladeshi population and external environmental determinants. This can lead to an increased number of health problems. This interconnectedness draws attention to the need of interdisciplinary approaches to health care. It's possible that focusing on infectious illnesses or non-communicable diseases in isolation won't be enough to solve the problem. Instead, it is necessary to use a comprehensive strategy that takes into account the gut-liver axis, the socio-environmental influences, and the genetic predispositions¹⁰. The numbers further emphasise the seriousness of the story presented by the convergence of microbial dysbiosis, diabetes, and enteric hepatitis in the complex web of global health. Understanding the complexities of health concerns in countries like Bangladesh provides a richer context for analysing global health trends. As a developing country,

Bangladesh has a unique set of health difficulties, including both long-standing issues and newer ones, such as the prevalence of non-communicable illnesses.

Bangladesh has been seeing an alarmingly similar growth in paediatric diabetes, although within its own distinct social and environmental context, mirroring a worldwide trend that has been highlighted by the International Diabetes Federation (IDF) as affecting over 1.1 million children and adolescents struggling with Type 1 diabetes⁷. This rise could be attributable to factors including urbanisation, dietary changes, and genetic predispositions¹¹. More targeted research may be necessary to get accurate data on the prevalence of diabetes in children in Bangladesh¹¹. However, enteric hepatitis, and especially Hepatitis E, continues to be a major health issue. According to 2019 WHO estimates, around 44,000 people will lose their lives to Hepatitis E. This number is mostly concentrated in East and South Asia, which includes Bangladesh¹². Contaminated water supplies are typically the cause of the nation's recurrent epidemics, highlighting the difficulties of public health infrastructure¹³. Such epidemics have a significant impact on the microbial landscape of the Bangladeshi population, which might result in dysbiosis and further exacerbate health issues.

However, more specific study is needed to understand this in the context of Bangladesh, especially among diabetic children with enteric hepatitis, since worldwide studies, such as one from the "Gut Microbes Journal," connect gut dysbiosis to various disorders, including diabetes¹⁴. Research of this kind might provide information on the gut-liver axis, as well as on environmental variables and inherited susceptibilities that are common among Bangladeshi people¹⁵. The complex relationship between microbial dysbiosis, diabetes, and enteric hepatitis in Bangladesh, although worldwide trends offer a framework, highlights the need for context-specific investigations and therapies¹⁶.

Conclusion

Bangladesh shows the delicate balance between infectious diseases and metabolic disorders in global health. The interactions of gut bacteria imbalance, diabetes, and liver infections in Bangladesh emphasize the importance of understanding the connections between health, environment, genetics, and society. Research in this area underlines the need for a new, holistic and adaptable healthcare approach, especially for different population needs. Bangladesh's experience

serves as an example for improving health globally. It suggests that better health outcomes can be achieved by understanding these relationships, and it points to the need for worldwide health strategies that focus on increasing health funding, raising awareness of disease links, and supporting detailed studies on microbes. Collaboration among governments, global health bodies, and local communities can merge traditional practices with modern medical insights.

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Bangladesh Journal of Infectious Diseases, December 2023;10(2):56-58