

Letter to Editor

Normal Microbiota: Let us Change our Perspective

Shirin Moossavi^{1,2*}¹Digestive Oncology Research Center, Digestive Disease Research Institute, Tehran University of Medical Sciences, Tehran, Iran²Department of Medical Microbiology and Infectious Diseases, University of Manitoba, Winnipeg, MB, Canada**Dear Editor,**

Gut microbiota bridges the interaction of host and environment and is centrally located in the mechanistic framework of multiple complex intestinal and extraintestinal diseases with multifactorial aetiologies.¹ Accordingly, it is increasingly being recognised as an important pillar of precision medicine.² Despite significant advancement in our understanding of gut microbiota association with diseases, the results have not been adequately translated into improved health and more effective health services. Moving towards clinical translation of microbiota research requires an actionable definition of normal microbiota. Currently, normal microbiota is defined by exclusion of existing diseases in the host. Similarly, dysbiosis, as the opposite state of normal, is defined based on association with disease.³ The normal/dysbiosis framework disregards the mechanism by which the microbial composition might become altered during the course of disease pathogenesis (*i.e.* distinguishing whether the compositional shifts are cause *vs.* consequence of the disease).⁴ Furthermore, even in the presence of a statistically significant difference in the overall microbiota composition between the healthy and disease states, more often than not, there is considerable degree of overlap between cases and controls.⁵ In other words, there are healthy individuals with supposedly “abnormal” microbiota while there are diseased individuals with “normal” microbiota.

The problem with attempts at defining a normal/healthy microbiota is that they belong to the Boorse’s bio-statistical theory of health which defines health as the absence of disease.⁶ However, it is argued that “health belongs to the clinical domain” and from the clinician’s perspective, it is ultimately what determines the probability of adverse outcomes and mortality.⁷ As such, a normal parameter is defined based on not only the lack of disease but also

the small probability of developing disease in the future. Extending this framework to the gut microbiota, it becomes evident that normal microbiota could not be determined in cross-sectional studies disregarding the association of the continuum of the gut microbiota composition with development of microbiota-associated chronic diseases and mortality over a lifetime. There is a need for an alternative concept to define the normality of the gut microbiota composition.

Conflict of Interest Disclosures

None.

Ethical Statement

Not applicable.

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