Gut Microbiota Dysbiosis in Human Obesity: Impact of Bariatric Surgery

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The gut microbiota is a recently described organ involved in many physiological functions all of which playing important roles in host health. Mouse studies including transfer of microbiota from mice or humans into germ-free mice have demonstrated that the gut microbiota could be a relevant player in obesity pathophysiology. Human studies also reported obesity is associated with major perturbations of the gut microbiota diversity, composition and function (i.e. dysbiosis) albeit with major inter individual variability. This dysbiosis is exacerbated in patients with severe obesity who are candidate to bariatric surgery. The number of bariatric surgeries reserved for the most severe cases associated with comorbidities increases in parallel with obesity epidemics. Studies in mice and human has shown that bariatric surgery procedures dramatically modify gut microbiota composition and function but after gastric bypass the rescue of gut microbiota is incomplete. Some changes in gut microbiota composition are however associated with improvement in clinical outcomes including improved corpulence and reduced inflammation. These changes are not always consistent and vary across populations. Further research efforts are thus needed to deepen the understanding of individual gut changes on in obesity and improved metabolism after bariatric surgery. A challenge is to provide evidence for the need to act therapeutically on the gut microbiota to improve each patient outcome in the long term. This has to be considered in a precision medicine approach. This lecture will address these aspects looking at the future of personalized medicine in this field.