

Obesity and stools, the “emperor’s new clothing” paradigm

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The Letter by Aguirre and Venema [1] is typical of the theory versus observation paradigm illustrated by “the emperor’s new clothing” fairytale [5]. Deductions made from experimental models have been found unreliable in many cases. By contrast, experimentation to confirm observations is critical and helps define causality [4]. As for obesity, metabolism and the role of the colon, a comprehensive review was recently published showing that people with colectomy do not have metabolic problems, obesity or long-term weight loss. Moreover, carbohydrates lipids and proteins are not found in the ileostomy effluent [3]. The only problems for the millions of people living with colectomy is the loss of water and minerals. Moreover, in some cases, malabsorption of bile acid and vitamin B12 can be observed. Theoretically, the fact that complex sugars provided by plants are partly degraded in the colon by the anaerobic flora may reduce caloric absorption, but it is not significant in western diets. Interestingly, speculation based on the synergistic role of *Methanobrevibacter smithi* and *Bacterioides thetaiotaomicron* in an experimental model has raised the hypothesis that obesity may be based on better adsorption of complex sugars. This is also hard to believe given the usual food intake of obese individuals! I suspect that the salad leaf in the hamburger plays a minor role in weight gain. Paradoxically, the same team found that in contrast, the stools of obese individuals contain fewer *Bacterioides* than those of lean individuals, thus contradicting the

whole theory. Beside this, the huge number of bacteria in the colon mean that the major players in metabolism (bacteria from the upper intestine) have been found to be below the detection threshold (around 10^6 bacteria per ml) in metagenomic studies. Finally, the various protocols used in the literature generate completely different results from one team to another, despite being reported in the most reputable journals [2]. This renders results hard to use.

In conclusion, stools are terrible samples for the study of metabolism in humans, as clinical observation has demonstrated. However, in major cases these are the only accessible samples. It is typically an example of “the emperor’s new clothing” story by HC Anderson, in which the described relationships between metagenomic studies of stool microbiota and obesity are not currently visible, if you do not believe in them. Finally, the large volumes of data produced by this technically simple approach will accumulate and may be useful at a later date.

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