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Childhood Obesity 2019: Modification of inflammation with probiotic intake in obese children - Marie Gombert - University of Valencia, Spain

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Introduction: Low grade inflammation is one of the main characteristic associated to obesity, and participates to the development of numerous comorbidities. The gut microbiota has been evidenced to interact with the host metabolic and inflammatory condition. We investigated the effect of an alimentary supplementation of Bifidobacterium pseudocatenulatum CECT 7765 on different elements of obese children health: gut microbiota global composition, inflammatory cytokines and cardiometabolic risk factors. which are due to the rotation of the earth, serve as the dominant environmental factor affecting living organisms. The temporal organization within an organism is essential for the maintenance of homeostasis as well as adaptation to changing external conditions. The term "circadian rhythms" describes endogenously generated rhythms that occur approximately every 24 hours and play a fundamental role in the survival and evolution of life by ensuring that the internal physiology of an organism remains synchronized with the external environment. There are elevations of monocytes and natural killer cells that are responsible for the secretion of inflammatory cytokines

Methods: The study included 48 obese children with insulin resistance. They received dietary recommendations and a capsule of probiotic (10 CFU) or placebo daily for 13 weeks. Clinical, biochemical and gut microbiome measurement were made at baseline and at the end of the intervention. The hypothesis that dietary factors influence intestinal inflammation can be explained by several biological mechanisms, including the presentation of the antigen, the alteration of the prostaglandin balance and the alteration of the microflora. New evidence suggests that sleep also plays an important role, as circadian rhythms and melatonin may act as regulators of inflammation in the gastrointestinal tract.

Results: All children displayed body mass index (BMI) improvement consecutive to the intervention. Probiotic intake impacted gut microbiota, increasing the proportion of Rikenellaceae family, particularly the Alistipes genus. Regarding metabolic and inflammatory parameters, the children who received the probiotic displayed significant decrease in circulating high-sensitive C-reactive protein (P=0.026), and monocyte chemoattractant protein-1 (P=0.032) and an increase in high-density lipoprotein cholesterol (P=0.035) and omentin-1 (P=0.023) in comparison with the children who received the placebo.

Conclusion: The positive impact of the intervention on the BMI of all children reveals the benefits provided by the dietary changes. By complementing this intervention with the intake of B. pseudocatenulatum CECT 7765, a modification of the gut microbiota has been obtained, with an increase of bacterial groups associated to lean phenotypes. In parallel, those children displayed a greater improvement on inflammatory status and metabolic health. Our results suggest that modulation of gut microbiota with probiotic to be an effective tool to ameliorate obesity-related alterations in children. Information from studies of circadian oscillations in the joint of innate intestinal immunity and adaptive to host-microbial interactions can integrate chronopharmacology to increase the effectiveness of agents used to modulate the immune response, i.e. to indicate the time of day. specific for the administration of antimicrobial and anti-inflammatory treatments. Likewise, the potential benefits of melatonin as a co-adjuvant therapy in gastrointestinal diseases, especially IBS and IBD, should be explored. These considerations open up new perspectives in the preventive and therapeutic applications of chronobiology

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