

TITLE: IMMUNOMODULATORY EFFECTS OF *Bifidobacterium lactis* HN019 ON SUBJECTS WITH OR WITHOUT METABOLIC SYNDROME

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ABSTRACT

Metabolic syndrome (MetS) can be defined as a set of metabolic risk factors involved in the development of cardiovascular disease and / or type 2 diabetes. Gut microbes and by modulate host metabolism by affecting energy extraction from food or by biochemically converting molecules derived from the host or from gut microbes themselves. So, changes in the intestinal microbes may alter metabolism and consequently may increase predisposition to different disease. Probiotics microorganisms may alter the composition of the intestinal microbiota and introduce beneficial functions, resulting in amelioration or prevention of intestinal, systemic disease as well as improvement of in the immune system. In this study, thirty three subjects were divided in two groups: without MetS (n=14) and with MetS (n=19) both ingested daily 80 mL of probiotic milk with *Bifidobacterium lactis* HN019 3.4×10^8 CFU/mL during 90 days. The blood samples were obtained at the T0 and T90 after 12 hours of fasting and taken to the Clinical Immunology Laboratory at the Londrina University Hospital to clinical analyses. The values in subjects with MetS (2.04 to 2.16) are higher than non-MetS or control group (1.89 to 1.90). These data in CD4⁺/CD8⁺ ratio when compared to the baseline in the group with MetS after 90 d of treatment may related to cellular immunity, evidences an improvement in the immune response. Related to the interleukin IL-6 and adiponectin, both decreased after 90 d of probiotic intake compared with baseline values ($p < 0.05$), indicates the reduction in the inflammatory process. Fat accumulation caused by obesity leads to increased production of these adipokines, which stimulate the hepatic production of acute-phase proteins, leading to a pro-inflammatory condition associated with the development of obesity co-morbidities as insulin resistance. Therefore, the reduction of these metabolites can be directly related to reducing the BMI in the group treated for 90 days with the probiotic *B. lactis* HN019 and consequently, contribute to the reduction of the characteristic parameters of MetS.. Although the benefits of probiotic administration are recognized and well documented, the mechanisms by which these microorganisms manifest positive action are still under discussion. The results showed potential effects of *B. lactis* HN019 in improving the immune responses, due to reduction of some inflammatory markers.

Keywords: immune system, probiotic milk, cytokines, obesity

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