



Lisbon, 2-4th October

Universidade Lusófona, Campo Grande



GUT MICROBIOTA COMPOSITION INFLUENCES THE EXTENT OF WEIGHT LOSS AFTER HYPOCALORIC DIET IN OBESE MALE ADOLESCENTS

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Prevalence of obesity among adolescents has been constantly increasing in the last decades. The treatment of obesity requires multidisciplinary approach, which includes dietary management. However, not all people respond to dietary intervention in the same way. Since gut microbiota has been tightly linked to obesity, the aim of this pilot study was to assess whether microbiota composition affects the outcome of the hypocaloric diet on weight loss in obese male adolescents.

Forty-four obese male adolescents (average BMI > 95th percentile), 12-15 years old, were selected from the large cohort of 500 patients. Their body composition was assessed before and after 3-week balanced hypocaloric diet (1200-1700 kcal) with preserved nutritional value. Microbial DNA was extracted from cryopreserved fecal samples collected before the dietary intervention. Alterations of the gut microbiota were analyzed using MiSeq 16S rRNA gene sequencing.

The primary outcome of the diet was the change in body weight and BMI. Subjects were divided in 2 groups according to significant differences in delta BMI after the dietary intervention ($P < 0.001$). The values for delta BMIs were 1.93 and 2.66 for groups 1 and 2, respectively. The observed differences were associated with fecal microbiome composition. Group 2 subjects, which have lost more weight, originally had less *Firmicutes spp.* bacteria, more specifically from families *Lachnospiraceae* and *Desulfovibrionaceae*.

These preliminary results show that the ability for diet-induced weight loss could be associated with microbiota composition. Whether certain bacterial taxa represent facilitating or resilience factor for weight loss is yet to be determined in future experiments.

Financial support: This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant No III41009).