

Streszczenie w języku angielskim (Summary)

Polycystic Ovary Syndrome (PCOS) is an endocrine and metabolic disorder affecting up to 20% of women of reproductive age. The cause of PCOS has not been clearly defined, although an improper diet, high in saturated fatty acids and simple sugars, is considered to have a significant impact on its development. More recently, the significant influence of the gut microbiota in the pathogenesis of PCOS has also been pointed out. It has been recognized that, in addition to the composition of the diet, the timing of meal consumption is also a factor in the composition of the bacterial consortium. Therefore, a time-restricted feeding (TRE) regimen, appears to be a tool to modulate not only the composition and overall condition of the gut microbiota, but also the health of the host. *The main objective of this study was to evaluate the effects of a high-fat/high-fructose (HF/HFr) diet on the composition of the gut microbiota and metabolic and endocrine disorders in a mouse model of PCOS, and to search for a dietary therapy to alleviate them.* Thirty-two female prepubertal C57BL/6 mice were included in the experiment and randomly divided into 4 groups, with 8 individuals in each group. Mice were implanted with a letrozole (LET) pellet (PCOS induction) or a placebo and fed a HF/HFr or standard diet (StD). The HF/HFr diet consumed during the prepubertal period, had a significantly stronger effect on the composition of the gut microbiota and its ability to produce metabolites than LET alone. The composition of the microbiota also correlated with some parameters, associated with PCOS. In addition, the HF/HFr diet caused the development of metabolic and endocrine disorders, not only in mice receiving LET, but also in the placebo group. Based on a systematic review of the literature, it was noted that TRE partially restored the circadian fluctuations of gut bacteria disrupted by the high-fat diet in animals. The regime had beneficial effects on improving the diversity and stimulating the growth of health-promoting bacteria (e.g. *Akkermansia*) in humans and animals fed a StD. Moreover, a positive correlation was observed between HDL fraction cholesterol concentration and species richness of the microbiota. The results add to the existing knowledge of the importance of the composition of the diet consumed during the post-pubertal period in the context of the development of PCOS, as well as the dietary therapeutic options for this disease.

Key words: Polycystic Ovary Syndrome, metabolic disorders, endocrine disorders, intestinal microbiota, time-restricted eating

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