

Vilniaus universitetas
Medicinos fakultetas

A decorative graphic consisting of four triangles: a solid black triangle pointing up at the top center, a solid grey triangle pointing down at the top right, a solid grey triangle pointing up at the bottom left, and a solid grey triangle pointing up at the bottom right.

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LXXV
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*Leidinį sudarė VU MF Mokslo specialistė
dr. Simona KILDIENĖ*

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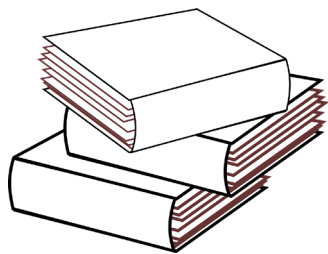
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Fiziologijos, biochemijos, mikrobiologijos ir laboratorinės medicinos katedra

FIZIOLOGIJOS GRUPĖ

ASSOCIATION BETWEEN FASTING AND INSULIN CONCENTRATION IN OVERWEIGHT WOMEN

Author. Johannes Maximilian FÖRSTER (5th year), Julija Elena KOEHNKE (5th year), Damian Luka MIALKOWSKYJ (4th year).

Supervisor. Prof. dr. Vaiva HENDRIXSON, Institute of Biomedical Sciences, Department of Physiology, Biochemistry, Microbiology and Laboratory Medicine, Faculty of Medicine, Vilnius University.

Background and aim. Insulin is an anabolic hormone secreted by beta cells of Langerhans islands of the pancreas as a physiological response to hyperglycemia. It reduces blood glucose levels and makes an intracellular metabolism of glucose possible. Overweight and obesity, especially visceral obesity, is a known risk factor for hyperinsulinemia. The aim of the study was to determine association between insulin concentration and its changes during fasting in overweight and obese women.

Materials and methods. The study was conducted in September 2022 at „Gilužio Sodyba“ in Lithuania. Eleven overweight and obese women aged between 27 to 64 years old participated in the study under the supervision of healthcare professionals. Participants underwent 5-days water-only fasting. The study protocol was approved by the Vilnius Regional Bioethics Committee No. 2021/11-1393-866. Anthropometric measurements (height, body mass) were measured and bioimpedance analysis using an ACCUNIO BC300 scale was performed on the days 1, 3 and 5 of fasting. Body mass index (BMI) was calculated. Women with a BMI of 25 kg/m² or greater were considered overweight. Venous blood samples were collected on the first and the last days of fasting and transported to VUL Santaros Klinikos, where they were frozen until analyzed. Insulin concentration (μIU/mL) was measured using ELISA detection kits.

Results. Blood samples of 11 (n=11) overweight women with a median age of 52 were tested for insulin (μIU/mL) concentrations. Comparing the median of insulin levels before (median=3.440) and after (median=1.810), a decrease could be seen. The BMI also decreased from a median of 32.60 before fasting to 31.20 afterwards. During fasting, the body's glucose supply decreases, which causes a decrease in insulin production. To analyze a possible association between insulin concentration and 5 days of fasting, the non-parametric Wilcoxon test with paired samples was used

(p-value=0.01855). Our data suggests that there is a statistically significant difference between insulin concentration levels before and after the 5-day fasting period. However, it is important to note that statistical significance does not necessarily mean that the effect of fasting on insulin levels is clinically significant. Further research would be needed to determine the clinical relevance of these findings and to better understand the potential implications for health.

Conclusions. The study results show that there is a significant reduction of insulin levels in response to 5 days of fasting in overweight women ($BMI \geq 25$). Fasting may have a complex effect on insulin concentration in the body. While it may initially cause a decrease in insulin production, release of other hormones to compensate for the decrease in glucose supply may be found. It is therefore important to consult with a healthcare provider before starting a fasting diet, especially in case of any underlying health conditions that may be affected by changes in insulin levels.

Keywords. Cytokines; Insulin; Fasting; Overweight; Women.