

Abstract

# Study of Cardio-Metabolic Risk in Overweight and Obese People with Impaired Vitamin D Status <sup>†</sup>

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**Abstract:** Background: Vitamin D deficiency increases cardio-metabolic risk through different mechanisms: activation of proinflammatory cytokines and mediation of endothelial dysfunction, insulin resistance, accelerated atherosclerosis, etc. Objectives: To study and analyze the cardiovascular (cardio-metabolic) risk in people with different levels of vitamin D. Methods: Laboratory and questionnaire data from 264 adults, mean age 41.19 years, were analyzed. The studied indicators were compared between people with deficiency and normal vitamin D levels, as well as between persons with normal and excessive BMI. Variation and correlation (Spearman's coefficient) were used. Results: It was established that vitamin D deficiency is related to some risk factors and cases of CVD. CVDs are significantly more common in people with vitamin D deficiency (15.9%) compared to 7.1% for those with a sufficiency of vitamin D and high blood pressure (36.4% compared to 27.4%). Overweight and obesity were found in 70.5% and 48.6% of those surveyed, respectively. Diabetes is present in 11.8% of people with vitamin D deficiency, compared to 4.3% in people with vitamin D sufficiency. Survey data show that people with vitamin D deficiency have more often followed a diet in the last year (74.1% compared to 55.7%), most often low-calorie (17.0%), followed by protein (Dukan) (8.0%), low-carbohydrate (4.5%), and starvation (4.5%). Diet is a modifiable risk factor in the prevention of CVD, but the "weight cycle" effect increases the risk of developing and maintaining cardio-metabolic risk and diseases. In persons with an excessive BMI, there has been a significantly more frequent change in weight in the last year: 59.4% compared to 30.6% in the control group ( $p < 0.001$ ). Weight gain was 5.53 kg versus 2.43 kg and was associated with an increased risk of CVD regardless of BMI. Discussion: The study shows that there is an increased cardiovascular risk in people with vitamin D deficiency, which increases if combined with an excessive BMI. Diet and weight variation are important triggers for the occurrence and development of CVD in various BMI and metabolic disorders.

**Keywords:** vitamin D; cardio-metabolic risk; obesity



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