

ABSTRACT

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Title: Sleep disorder as a risk factor for the development of diabetes mellitus type 2

Diploma thesis

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Field: Pharmacy

Background: The aim of this thesis with the help of available domestic and foreign literature is to analyze the impact of sleep disorders on the development of Diabetes Mellitus type II.

Main findings: In our work we show the basic characteristics of sleep disorders and diabetes mellitus. We focused on some of the factors which were demonstrated to affect the metabolism. It was found that chronic sleep disorders lead to the increased production of cortisol which in a long term affects the metabolism of carbohydrates, fats and proteins and also influences the development of insulin resistance. As a result of sleep disorders is also the reduction of the concentration of leptin, resulting in increased appetite. Studies conducted on mice show that due to increased levels of ghrelin, as a result of sleep disorders, there is also an increase in food intake. Increased levels of ghrelin increases the secretion of growth hormone and orexins, hormones that also affect metabolism. Sleep disorders can affect the levels of cytokines, especially, IL-1, IL-6 and TNF- α , which are produced in the organism in relation with the duration of the sleep. Their increased production, as a result of sleep disorders has been linked to positive modulation or induction of white adipose tissue that plays an important role in metabolic disorders and Diabetes Mellitus type II. Additionally the development of insulin resistance and impaired insulin signaling pathways at the cellular level are important factors.

Conclusions: Sleep disorders obviously affect the regulatory mechanisms of metabolism which variances can lead to the development of obesity and metabolic syndrome in which obesity is a main symptom. Numerous experimental and clinical studies have confirmed a link between sleep disorders and the development of Diabetes Mellitus type II.

Key word: Diabetes mellitus type II., sleep disorders, metabolic syndrome, cortisol, leptin, ghrelin, orexin, growth hormone, IL-1, IL6, TNF- α