

Sleep Apnea, Sleep Disturbance, and Fasting Glucose Variability: A Pilot Study

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Abstract

Background:

Disturbed sleep and nocturnal altered breathing are related to disturbances of glucose metabolism. The present uncontrolled observational study explores the role of these factors on the variability of fasting glycemia.

Methods:

The number and duration of nocturnal awakenings and the fasting glycemia of 97 patients with type 2 diabetes treated with diet, metformin, or gliptins were recorded over seven consecutive days. During the same time period, the main respiratory indexes—oxygen disturbance index, apnea/hypopnea index, and respiratory disturbance index—were recorded for one night.

Results:

The three respiratory indexes and the number of nocturnal awakenings are highly correlated with the coefficient of variation of the fasting blood glucose recorded over the 7-day period at $p < .005$ level. A multiple regression analysis showed that the variables in the model explained 86% of the variability.

Discussion:

Respiratory/sleep disturbances appear to be modulators superimposed on blood glucose levels determined by other factors.

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Abbreviations: (AHI) apnea/hypopnea index, (BMI) body mass index, (CV) coefficient of variation, (FBG) fasting blood glucose, (GV) glucose variability, (HbA1c) glycated hemoglobin, (nAW) number of awakenings, (O2 Desat) total number of episodes of oxygen desaturation, (ODI) oxygen disturbance index, (OSAS) obstructive sleep apnea syndrome, (RDI) respiratory disturbance index, (SD) standard deviation, (SLD) sleep disruption, (SMBG) self-monitoring of blood glucose, (s-time) time spent sleeping

Keywords: glucose variability, obstructive sleep apnea syndrome

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