

Prevalence of Sleep Abnormalities and Their Association with Metabolic Syndrome among Asian Indians: Chennai Urban Rural Epidemiology Study (CURES – 67)

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Abstract

Objective:

To estimate the prevalence of sleep abnormalities and their association with glucose intolerance and metabolic syndrome (MS) in the normal-weight urban South Indian population.

Methods:

This population-based, cross-sectional study was carried out in 358 subjects aged 20–76 years randomly selected from the Chennai Urban Rural Epidemiology Study in South India. A validated questionnaire assessing various sleep abnormalities (snoring, daytime sleepiness, lack of refreshing sleep, and number of hours of sleep) was administered. All subjects underwent an oral glucose tolerance test, and anthropometric biochemical measurements were obtained to assess cardiometabolic risk factors including glucose intolerance. Diabetes risk was assessed using a previously validated Indian Diabetes Risk Score (IDRS).

Results:

The overall prevalence of snoring and daytime sleepiness was 40% and 59%, respectively. Snorers were more male, older, smokers, and had higher levels of cardiometabolic risk factors. Subjects with daytime sleepiness had higher body mass index (BMI) and abdominal obesity. Both snoring (50.9% vs 30.2%, $p < 0.001$) and daytime sleepiness (68% vs 49.7%, $p < 0.001$) were more prevalent among subjects with impaired glucose metabolism compared to those with normal glucose metabolism. Both sleep measures were associated with higher diabetes risk scores, as assessed by the IDRS (snoring: trend χ^2 , 11.14, $p = 0.001$; daytime sleepiness: trend χ^2 , 5.12, $p = 0.024$). Metabolic syndrome was significantly associated with snoring even after adjusting for age, sex, family history of diabetes, physical activity, smoking, and alcohol.

Conclusion:

The prevalence of snoring and daytime sleepiness is high among urban South Indians and these two sleep measures are associated with glucose intolerance, MS, and higher diabetes risk scores.

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Abbreviations: (BMI) body mass index, (CI) confidence interval, (CURES) Chennai Urban Rural Epidemiology Study, (CVD) cardiovascular disease, (HbA1c) glycosylated hemoglobin, (IDRS) Indian Diabetes Risk Score, (IFG) impaired fasting glucose, (IGT) impaired glucose tolerance, (MS) metabolic syndrome, (NCEP-ATPIII) National Cholesterol Education Program and Adult Treatment Panel III, (NGT) normal glucose tolerance, (STOP) snoring, tiredness during daytime, observed apnea, and high blood pressure, (WHO) World Health Organization

Keywords: sleep abnormalities, snoring, daytime sleepiness, cardiometabolic risk factors, metabolic syndrome, Asian Indians

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