

Obstructive sleep apnoea is independently associated with the metabolic syndrome but not insulin resistance state.

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Obstructive sleep apnoea (OSA) is a cardio-metabolic disorder. Whether metabolic syndrome (MS), insulin resistance (IR) and albuminuria are independently associated with OSA is unclear, but defining the interactions between OSA and various cardiovascular (CV) risk factors independent of obesity facilitates the development of therapeutic strategies to mitigate their increased CV risks. We prospectively recruited 38 subjects with OSA and 41 controls. Anthropometric measurements, glucose, lipids, insulin and blood pressure (BP) were measured after an overnight fast. IR state was defined as homeostasis model assessment (HOMA) value >3.99 and MS diagnosed according to the International Diabetes Federation (IDF) criteria. Subjects with OSA were more obese, more insulin resistant, more hyperglycaemic, had higher Epworth score (measure of day time somnolence) and systolic blood pressure levels. The prevalence of MS was higher in OSA compared with non-OSA subjects (74% vs 24%, $p < 0.001$). The prevalence of microalbuminuria in both groups was negligible. Logistic regression adjusted for age, BMI and smoking showed that the patient with OSA was 5.9 (95% CI 2.0-17.6) times more likely to have MS than non-OSA patient. Triglyceride ($p = 0.031$), glucose (0.023) and Epworth score (0.003) values were independently associated with OSA after adjusting for BMI and other covariates whilst IR status was found not to be significant. Using the ROC curve analysis, we found that a waist circumference of >103 cm would predict MS in patients with OSA at 75-78% sensitivity and 61-64% specificity. The agreement between MS and IR state in this cohort is poor. Thus, OSA is associated with MS independent of obesity predominantly due to increased triglyceride, glucose and Epworth score values but not IR or microalbuminuria status. This observation suggests an alternative pathogenic factor mediating the increased cardiovascular risk in patients with OSA and MS, other than that due to IR. The independent link between Epworth score and MS in patients with OSA implicates the role of daytime sleepiness and chronic hypoxia as a potential mediator. Given the discordant between MS and IR state, measurement of waist is useful for predicting mainly MS but not insulin resistance status in patients with OSA. Appropriate pharmacological intervention targeting these independent factors is important in reducing the increased CV risks among patients with OSA.

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