Am J Respir Crit Care Med. 2002 Mar 1;165(5):670-6. Full Text FREE ajrccm.atsjournals.org Links Comment in: Am J Respir Crit Care Med. 2002 Mar 1;165(5):562-3.

Obstructive sleep apnea is independently associated with insulin resistance.

Ip MS, Lam B, Ng MM, Lam WK, Tsang KW, Lam KS.

Department of Medicine, The University of Hong Kong, Queen Mary Hospital, Pokfulam, Hong Kong S.A.R., PR China. msmip@hkucc.hku.hk

Epidemiological studies have implicated obstructive sleep apnea (OSA) as an independent comorbid factor in cardiovascular and cerebrovascular diseases. It is postulated that recurrent episodes of occlusion of upper airways during sleep result in pathophysiological changes that may predispose to vascular diseases. Insulin resistance is a known risk factor for atherosclerosis, and we postulate that OSA represents a stress that promotes insulin resistance, hence atherogenesis. This study investigated the relationship between sleepdisordered breathing and insulin resistance, indicated by fasting serum insulin level and insulin resistance index based on the homeostasis model assessment method (HOMA-IR). A total of 270 consecutive subjects (197 male) who were referred for polysomnography and who did not have known diabetes mellitus were included, and 185 were documented to have OSA defined as an apnea-hypopnea index (AHI) > or =5. OSA subjects were more insulin resistant, as indicated by higher levels of fasting serum insulin (p = 0.001) and HOMA-IR (p < 0.001); they were also older and more obese. Stepwise multiple linear regression analysis showed that obesity was the major determinant of insulin resistance but sleep-disordered breathing parameters (AHI and minimum oxygen saturation) were also independent determinants of insulin resistance (fasting insulin: AHI, p = 0.02, minimum O(2), p = 0.041; HOMA-IR: AHI, p = 0.044, minimum O(2), p = 0.022); this association between OSA and insulin resistance was seen in both obese and nonobese subjects. Each additional apnea or hypopnea per sleep hour increased the fasting insulin level and HOMA-IR by about 0.5%. Further analysis of the relationship of insulin resistance and hypertension confirmed that insulin resistance was a significant factor for hypertension in this cohort. Our findings suggest that OSA is independently associated with insulin resistance, and its role in the atherogenic potential of sleep disordered breathing is worthy of further exploration.

PMID: 11874812 [PubMed - indexed for MEDLINE]