

Obesity, and Not Obstructive Sleep Apnea, Is Responsible for Increased Serum hs-CRP Levels in Patients With Sleep-Disordered Breathing in Delhi

S K Sharma¹, Hemant Kumar Mishra, Hanish Sharma, Ashish Goel, V Sreenivas, Vinay Gulati, Mohammad Tahir

Affiliations + expand

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Abstract

Objective: The present study was conducted to evaluate serum levels of high-sensitivity C-reactive protein (hs-CRP) in newly diagnosed patients with obstructive sleep apnea (OSA).

Subjects and methods: Between April 2005 and March 2006, a total of 231 consecutive adult habitual snorers underwent polysomnography (PSG) in the sleep laboratory. Ninety-seven subjects were found suitable for hs-CRP measurement after application of the following exclusion criteria: patients with diabetes mellitus, hypertension, coronary artery disease, acromegaly, hypothyroidism, chronic renal failure, congestive cardiac failure, or smoking history, patients who were pregnant, on steroid treatment, on hormone replacement therapy, or with chronic use of drugs such as non-steroidal anti-inflammatory drugs, oral anticoagulants and lipid-lowering drugs and patients having undergone upper airway surgery. Patients were classified as apneic [apnea-hypopnea index (AHI)>5], obese non-apneic [body mass index (BMI)>25, AHI<5] and non-obese non-apneic (BMI<25, AHI<5). C-reactive protein levels were measured in stored sera by high-sensitivity enzyme immunoassay (Biocheck, Inc. Foster City, CA, USA). After checking normality with the Kolmogorov-Smirnov test and using a square-root transformation, Pearson's and partial correlation coefficients were calculated for identified risk factors and confounders. A multiple linear regression model was used to identify variables that were independently associated with hs-CRP.

Results: The mean serum levels of hs-CRP were found to be 0.25+/-0.23, 0.58+/-0.55, and 0.51+/-0.37 mg/dl in non-obese non-apneics (n=23), obese non-apneics (n=45) and apneics (obese and non-obese, n=29), respectively. Pearson's correlation coefficient of hs-CRP with BMI was found to be 0.25 (p=0.01), and with AHI 0.16 (p=0.12). Partial correlation analysis showed that hs-CRP levels correlated significantly with BMI after adjustment for AHI and age (r=0.22, p=0.03), while correlation with disease severity as assessed by AHI after adjustment for BMI and age was not significant (r=0.10, p=0.33). After stepwise multiple linear regression, only BMI was found to be significantly associated with serum hs-CRP levels (beta=0.02, p=0.01).

Conclusions: In this first comprehensive cross-sectional study on Indian subjects, we found that obesity, and not obstructive sleep apnea, is associated with elevated serum levels of hs-CRP. No independent correlation was found between severity of OSA and hs-CRP in the present study.