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Cardiology. 2005;104(2):92-6. Epub 2005 Jul 7. KARGER Full Text Links

# Altered blood rheology in obstructive sleep apnea as a mediator of cardiovascular risk.

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BACKGROUND: Cardiovascular complications are common in patients with obstructive sleep apnea (OSA). Blood rheology is a major determent of coagulation and an established risk factor for cardiovascular events. Since nocturnal hypoxemia could influence parameters of blood rheology, we hypothesized that OSA alters blood rheology independent of other cardiovascular risk factors. METHODS: One hundred and ten consecutive patients admitted to the sleep laboratory were included. The association of plasma fibrinogen and viscosity (as parameters of blood rheology) with OSA was evaluated. RESULTS: One hundred and ten patients aged 61.4+/-10.1 years (body mass index 28.4+/-4.1 kg/m2) were included. OSA was confirmed in 63 patients (57.2%) with an apnea-hypopnea index (AHI) of 28.7+/-14.9 events/hour. Patients with OSA showed higher levels of plasma viscosity (1.36+/-0.09 vs. 1.31+/-0.08 mPas, p=0.005). Nevertheless, hypertensive apneics have even higher levels of plasma viscosity than nonapneics (1.38+/-0.091 vs. 1.32+/-0.028 mPas, p=0.018). Similar results were found in patients with coronary artery disease, where OSA was associated with elevated plasma viscosity (1.36+/-0.076 vs. 1.31+/-0.081 mPas, p=0.007). Plasma fibrinogen was correlated with nocturnal minimal oxygen saturation (r=-0275, p=0.0036) and AHI (r=0.297, p=0.001). OSA was associated with higher plasma fibrinogen (353+/-83 vs. 317+/-62 mg/dl, p=0.015). These differences persist with control for cardiovascular risk factors. CONCLUSIONS: Patients with OSA have elevated morning fibrinogen levels and a higher plasma viscosity, which correlate positively with indices of sleep apnea severity. These changes in blood rheology are independent of cardiovascular risk factors, and therefore, might be specific mechanisms of OSA. This supports the pathophysiological concept that sleep apnea is a cardiovascular risk factor. Copyright (c) 2005 S. Karger AG, Basel.

PMID: 16015032 [PubMed - indexed for MEDLINE]