



PORTAGE HEALTH

Sleep Disorders Center

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unadjusted analysis revealed that OSA (apnea-hypopnea index >5) was associated with stroke or death from any cause (hazard ratio, 2.24; 1.30-3.86). The adjusted OSA analysis retained a statistically significant association with stroke or death (hazard ratio, 1.97; 1.12-3.48). In separate unadjusted analyses, OSA was associated with death and stroke with relative risks of 1.68 (1.10-2.25) and 5.16 (3.72-6.60), respectively. *The investigators concluded that OSA independently contributes to stroke risk.*

The Effects of Continuous Positive Airway Pressure on Prehypertension and Masked Hypertension in Men With Severe Obstructive Sleep Apnea

Drager LF, Pedrosa RP, et al.
Hypertension. 2011 Jan 17

O bstructive sleep apnea and hypertension are common conditions that frequently coexist. Continuous positive airway pressure (CPAP) reduces blood pressure in patients with obstructive sleep apnea and sustained hypertension. However, the impact of CPAP on patients with obstructive sleep apnea and prehypertension and masked hypertension, conditions associated with increased cardiovascular risk, is unknown. Thirty-six male patients (age, 43±7 years; body mass index, 28.8±3.0 kg/m²) with untreated severe obstructive sleep apnea (apnea-hypopnea index, 56±22 events/hr on polysomnography) with diagnostic criteria for prehypertension and/or masked hypertension, based on office and 24-hour ambulatory blood pressure monitoring, respectively, were studied. The patients randomized to no treatment (control; n=18) or CPAP (n=18) for 3 months had similar frequency of prehypertension and masked hypertension at study entry.

There were no significant changes in blood pressure in patients randomized to the control group. In contrast, patients randomized to CPAP presented significant reduction in office systolic

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Is Obstructive Sleep Apnea an Independent Risk Factor for Stroke?

Capampangan D.J., Wellik K.E.
Neurologist. 2010 Jul;16(4):269-73.

O bstructive sleep apnea (OSA) is associated with hypertension, atrial fibrillation, coronary artery disease, congestive heart failure, and diabetes. These disorders are also risk factors for stroke. The purpose of this study was to determine whether OSA increases the risk of stroke independently of other cerebrovascular risk factors. The objective was addressed through the development of a structured critically appraised topic. This evidence-based methodology included a clinical scenario, structured question, search strategy, critical appraisal, results, evidence summary, commentary, and bottom line conclusions. Participants included consultant and resident neurologists, a medical librarian, clinical epidemiologists, and content experts in the field of sleep medicine and vascular neurology.

A large observational cohort study was selected and appraised to address this prognostic question. The

Positive Airway Pressure ...continued

(from 126 to 121 mm Hg) and a trend for diastolic blood pressure (from 75 to 73 mm Hg) as well as a significant decrease in daytime and nighttime systolic and diastolic blood pressure. There was a significant reduction in the frequency of prehypertension (from 94% to 55%) and masked hypertension (from 39% to 5%) only in the CPAP group. *In conclusion, effective CPAP therapy promotes significant reduction in the frequency of prehypertension and masked hypertension by promoting significant blood pressure reductions in patients with severe obstructive sleep apnea.*

Sleep Restriction for One Week Reduces Insulin Sensitivity in Healthy Men

Buxton OM, Pavlova M, et al.
Diabetes. 2010 Jun 28.

Short sleep duration is associated with impaired glucose tolerance and an increased risk of diabetes. The effects of sleep restriction on insulin sensitivity have previously not been established. This study tests the hypothesis that decreasing nighttime sleep duration reduces insulin sensitivity and assesses the effects of a drug, modafinil, that increases alertness during wakefulness. This twelve-day, inpatient General Clinical Research Center study included twenty healthy men (age 20-35 years, BMI 20-30 kg/m²). Subjects spent 10 hours/night in bed for ≥ 8 nights including 3 inpatient nights (sleep-replete condition), followed by 5 hours/night of time in bed for 7 nights (sleep-restricted condition). Subjects received modafinil (300 mg/day) or placebo during sleep restriction. Diet and activity were controlled. On the last two days of each condition we assessed glucose metabolism by intravenous glucose tolerance test (IVGTT) and euglycemic hyperinsulinemic clamp. Salivary cortisol, 24-hr urinary catecholamines, and neurobehavioral performance were measured.

IVGTT-derived insulin sensitivity was reduced 20% after sleep restriction, without significant alterations in the insulin secretory response. Similarly, insulin sensitivity assessed by clamp was reduced 11% after sleep restriction. Glucose tolerance and the Disposition Index were reduced by sleep restriction. These outcomes were not affected by modafinil treatment. Changes in insulin sensitivity did not correlate with changes in salivary cortisol (increase of 51) with sleep

restriction, urinary catecholamines or slow wave sleep. *The authors concluded that sleep restriction (5 hrs/night) for one week significantly reduces insulin sensitivity, raising concerns about effects of chronic insufficient sleep on disease processes associated with insulin resistance.*

Vascular Inflammation in Obesity and Sleep Apnea

Jelic S, Lederer DJ, et al.
Circulation 2010 Mar 2;121(8):1014-21

Unrecognized obstructive sleep apnea (OSA) is highly prevalent in obesity. Both obesity and OSA are associated with vascular endothelial inflammation and increased risk for cardiovascular diseases. The authors investigated directly whether the endothelial alterations that are attributed commonly to obesity are in fact related to OSA. Seventy-one subjects with a body mass index ranging from normal to obese underwent attended polysomnography. To assess vascular inflammation and oxidative stress directly, the authors quantified the expression of nuclear factor-kappaB and nitrotyrosine by immunofluorescence in freshly harvested venous endothelial cells. To evaluate basal endothelial nitric oxide (NO) production and activity, they quantified the expression of endothelial NO synthase (eNOS) and phosphorylated eNOS. Vascular reactivity was measured by brachial artery flow-mediated dilation. Expression of eNOS and phosphorylated eNOS and flow-mediated dilation were significantly lower, whereas expression of nitrotyrosine was significantly greater in OSA patients (n=38) than in OSA-free subjects (n=33) regardless of central adiposity.

Expression of nuclear factor-kappaB was greater in obese OSA patients than in obese OSA-free subjects. Protein expression and flow-mediated dilation were not significantly affected by increasing body mass index or central obesity in OSA patients and in OSA-free subjects. After 4 weeks of continuous positive airway pressure therapy, flow-mediated dilation and expression of eNOS and phosphorylated eNOS significantly increased whereas expression of nitrotyrosine and nuclear factor-kappaB significantly decreased in OSA patients who adhered to continuous positive airway pressure ≥ 4 hours daily. *The authors concluded from the results of this study that untreated OSA rather than obesity is a major determinant of vascular endothelial dysfunction, inflammation, and elevated oxidative stress in obese patients.*