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Association of short sleep duration with weight gain and obesity at 1-year follow-up: a large-scale prospective study

Authors: Watanabe M et al.
URL: http://www.journalsleep.org/ViewAbstract.aspx?pid=27690

Comment: This study, of over 35,000 Japanese workers who undertook two annual detailed health checks and provided estimates of self-reported sleep duration, indicated that <6 hours sleep (compared with 7-8 hours) was associated with a BMI gain of ~ 0.03 to 0.10 kg/m² over 12 months (equating to ~2 to 5 kg per annum, based on heights of 1.6 m and 1.7 m for women and men, respectively). Moreover, baseline BMI and the change in BMI appeared to be “dose-dependent” with progressive chronic sleep deprivation. Of interest, >9 hours of self-reported sleep was also associated with weight gain! The study highlighted the importance of regular monitoring of weight and duration of sleep. This monitoring is likely to be of equal or greater importance than routine blood testing, which is commonly undertaken in developed communities. This study (and that of Luckhaupt, on next page) are even more important when considered in the light of emerging evidence that suggests sleep deprivation is associated with increased appetite for high calorie foods and impaired glucose uptake, leading to type 2 diabetes mellitus.
The prevalence of short sleep duration by industry and occupation in the national health interview survey

Authors: Luckhaupt SE et al.
URL: http://www.journalsleep.org/ViewAbstract.aspx?pid=27689

Comment: Based upon a sample size of >65,000 US workers, the percentage who regularly sleep for ≤6 hours or engage in shift work has increased from 24.2% to 30.1% and 15.9% to 17.7%, respectively, over the past 20 years. Males aged 45-55 years were over represented in this sleep-restricted group, and were more likely to be obese, to smoke and to drink alcohol. The industries with the greatest proportion of workers with sleep restriction were the transport (36%), manufacturing (35%) and healthcare industries (32%), whereas shift work was most common in the service (36%), mining (32%) and transportation industries (28%). As with the Japanese study of Watanabe et al., this study highlights that the well publicised and exploding obesity epidemic is paralleled by a progressive increase in sleep deprivation.

Sleep disordered breathing and mortality: a prospective cohort study

Authors: Punjabi NM et al.
URL: http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1000132

Comment: As part of the Sleep Heart Health Study, 6,441 community dwellers aged >40years underwent baseline polysomnography and were followed up after a mean interval of 8.2 years. At follow-up, 147 (2.3%) were receiving treatment for obstructive sleep apnoea (OSA) and were excluded from further analysis, and 1,047 had died. The odds ratio of death, after controlling for smoking, systemic blood pressure, diabetes and cardiovascular disease, was significant for males aged 40-70 years with severe OSA [apnoea/hypopnoea index (AHI) >30/h, odds ratio 2.09] and hypoxaemia (total sleep time with <90% oxygen saturation >2.7%, odds ratio 1.87). Importantly, arousal frequency and central apnoea index were not predictive for mortality. OSA was not predictive for mortality in women (all ages) or men aged >70years. This is the largest cohort study of sleep disordered breathing, with the longest follow-up period and it confirms that the increased mortality associated with severe OSA is correlated with hypoxaemia in middle aged males, independent of known risk factors.
**Lifestyle intervention with weight reduction: first line treatment in mild obstructive sleep apnea**

Authors: Tuomilehto HPI et al.


URL: [http://ajrccm.atsjournals.org/cgi/content/full/179/4/320](http://ajrccm.atsjournals.org/cgi/content/full/179/4/320)

**Comment:** This 12-month long randomised controlled trial of intensive weight loss (very low calorie diet with supervised lifestyle management) versus a conservatively managed control group, in patients with mild OSA (AHI 5-15/h) and moderate obesity (BMI 28-40 kg/m²) revealed greater weight loss (101.2 to 90.2 kg), with OSA “cure” (AHI <5/h) in 63% of the active group, whereas the control group weight loss was less (92.3 to 89.9kg) and only 35% had their OSA “cured”. There were minor improvements in quality of life in the actively treated group. Importantly weight loss was maintained over the 12 months. Unfortunately, the group mean baseline weights were statistically different between the groups, which detracted from the quality of this study. Also, snoring and partner perception of snoring were not recorded. In contrast to many disorders, mild OSA is more difficult to treat than severe OSA. This study suggests that weight loss may be useful, and even those who are not cured, may often be more amenable to mandibular advancement splint or positional therapy.

**Effects of oropharyngeal exercises on patients with moderate obstructive sleep apnea syndrome**

Authors: Guimaraes KC et al.


URL: [http://ajrccm.atsjournals.org/cgi/content/full/179/10/962](http://ajrccm.atsjournals.org/cgi/content/full/179/10/962)

**Comment:** Non-obese (BMI <40 kg/m²) middle aged patients with moderate OSA (AHI 15-30/h), who performed daily upper airway exercises for 3 months showed a statistically greater fall in AHI (22 to 14/h) compared with an untreated control group (22 to 26/h). Of interest was the 1.1 cm decrease in mean neck circumference in the active group, without a change in BMI. Subjective assessment indicated that snoring also diminished in the active group but not in the control group. Speech therapy-directed exercises took 30 min per day and involved tongue, palatal and facial muscles. Although complete abolition of OSA was not observed in all patients, the findings do suggest a potential role for training of upper airway muscles, as a form of “rehabilitation”, similar to that used for many other medical conditions. Importantly, this study highlights the role of speech therapy in respiratory medicine, beyond vocal cord dysfunction, avoidance of aspiration and difficult asthma.
Randomised controlled trial of variable-pressure versus fixed-pressure continuous positive airway pressure (CPAP) treatment for patients with obstructive sleep apnea/hypopnea syndrome (OSAHS)

Authors: Vennelle M et al.


URL: http://www.journalsleep.org/ViewAbstract.aspx?pid=27702

Comment: Two hundred CPAP naïve patients with OSA (AHI >15/h) participated in a randomised blinded cross over trial in which fixed or variable CPAP was used for 6 weeks each. The primary outcome, patient device preference, did not differ. Two secondary outcomes, the Epworth Sleepiness Scale and daily usage of CPAP, were significantly better (9.5 vs 10.0 and 4.2 vs 4.0 hours) with variable CPAP compared with fixed CPAP; however these changes were small and of dubious clinical significance. No differences were observed for objective measures of sleepiness (Osler), attention (psychomotor vigilance task) or quality of life (SF-36). Thus discrimination of patient groups that might benefit from using a variable CPAP device remains unclear. Moreover, given the proprietary nature of variable CPAP algorithms, the results of this trial may not be applicable to other manufacturers. Interestingly, patients were more likely to prefer the first CPAP device they tried, irrespective of the type. More work is needed to place variable CPAP in the treatment algorithm for the practising clinician.

Relationship between overnight rostral fluid shift and obstructive sleep apnea in nonobese men

Authors: Redolfi S et al.


URL: http://ajrccm.atsjournals.org/cgi/content/full/179/3/241

Comment: Spontaneous overnight fluid shift from the lower limbs, measured by bioelectrical impedance, correlated strongly with neck circumference and AHI in 23 non-obese (BMI <30 kg/m²) males being assessed for OSA. Interestingly, the amount of lower limb fluid shift also correlated with amount of time spent seated whilst awake; i.e. greater fluid shift, and thereby OSA, was associated with a sedentary lifestyle. Whether daytime activity correlates with less fluid shift and therefore, can be considered as a therapeutic option, independent of change in body weight, needs to be assessed further.

Long-term time-course of nocturnal breathing disorders in heart failure patients

Authors: Pinna GD et al.


URL: http://erj.ersjournals.com/cgi/content/full/35/2/361

Comment: This study describes a cohort of 79 stable patients with moderate to severe heart failure, who received monthly home cardiopulmonary monitoring for 12 months. The main finding was that 57% had consistent sleep disordered breathing (SDB) (i.e. AHI >5/h at each study), 30% had occasional SDB and 13% consistently had no SDB. Although AHI and percentage periodic breathing (PB) were not objectively compared, the authors identified similar prevalences for AHI >5/h and PB duration >60 min or AHI >15/h and PB duration >120 min. PB was defined as >3 min oscillation in tidal volume of >25%. Unfortunately the clinical outcomes associated with PB or sleep disordered breathing were not discussed, and nor were the authors able to differentiate the SDB into OSA and central sleep apnoea subgroups.
Effects of exercise training in patients with congestive heart failure and sleep apnea

Authors: Ueno LM et al.

Comment: In a small before and after trial of a 4-month exercise programme in 24 patients with heart failure and either OSA (n=8), central sleep apnoea (CSA) (n=9) or no apnoea (n=7), exercise capacity, autonomic control, New York Heart Association class and quality of life improved independent of the type of apnoea, although left ventricular ejection fraction did not change. In the OSA group, AHI fell (34 to 22/h) and minimum SaO$_2$ (80 to 85%) and slow wave sleep increased (7 to 13%), independent of weight change. The improvement in VO$_2$ max with exercise was ~38% (from ~16 to 22 kg/mL/min), which is extraordinary; unfortunately weight loss, which can falsely amplify this marker of exercise capacity, was not reported. Nevertheless, the relationship between exercise and sleep remains largely uncharted territory that is worthy of exploration!

Outcomes in patients with chronic obstructive pulmonary disease and obstructive sleep apnea. The overlap syndrome

Authors: Marin JM et al.
Reference: Am J Respir Crit Care Med 2010 April 8; Epub ahead of print, doi:10.1164/rccm.200912-1869OC
URL: [http://ajrccm.atsjournals.org/cgi/reprint/200912-1869OCv1](http://ajrccm.atsjournals.org/cgi/reprint/200912-1869OCv1)

Comment: In a large observational study of 651 COPD patients (mean FEV$_1$ 55%) over 9.4 years, all cause mortality and time to first hospital admission for acute exacerbations of COPD were significantly greater in the subgroup with untreated OSA, compared with subgroups with either treated OSA or no OSA. This study identified the importance of identifying OSA in COPD patients; however formal randomised controlled trials are lacking. Moreover, the relationship between OSA and COPD with hypercapnia and associated risk factors (obesity, use of corticosteroids and sedatives, upper airway instability and the effects of supplemental oxygen on respiratory control) cloud the picture. Although the prevalence of OSA in COPD patients is said to be similar to that in the normal population, low baseline SaO$_2$, side effects medication and other disturbances to ventilation are more common in COPD patients, making identification of OSA more difficult. This study is an excellent early step in separating and understanding the outcomes for patients with these two common disorders, who are cared for by the same community of respiratory physicians.

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