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Obstructive sleep apnoea in the general population: highly prevalent but minimal symptoms

Authors: Arrandottir ES et al.

Summary: These researchers examined polysomnographic sleep recordings, questionnaires and data from psychomotor vigilance tests obtained from a general population sample of 415 Icelanders aged 40–65 years. In this cohort, 24.1% had mild OSA (AHI 5–14.9), 12.5% had moderate OSA (AHI 15–29.9), 2.9% had severe OSA (AHI ≥30) and 3.6% were already diagnosed and receiving OSA treatment. No relationship was observed between AHI and subjective sleepiness or clinical symptoms, whereas a relationship with objective vigilance, as assessed by the psychomotor vigilance test, was found for patients with AHI ≥30. Subjects already on OSA treatment and those accepting OSA treatment after participating in the study were more symptomatic and sleepier than others with similar OSA severity, as assessed by the AHI.

Comment: These Icelandic authors report on 415 participants who underwent level II sleep testing. The authors found 12 (3%) participants had severe sleep apnoea. However, they also found that 100 (25%) had mild and 52 (13%) moderate sleep apnoea; most of these participants reported no sleep-related symptoms, were not sleepy and didn’t have decreased vigilance. The editorial gives an overview of the debate on treatment, including reminding us of the report that patients with moderate sleep apnoea may have an ‘unexpected survival advantage’ (J Sleep Res 2009;18(4):397–403) and gives the bottom line: don’t only focus on elimination of the AHI, address modifiable risk factors of cardiometabolic health.


Sleep-disordered breathing in adolescents and younger adults

Authors: Brockmann PE et al.

Summary: This was a survey of a representative population of 2147 Hispanic Chileans aged 15–40 years. They were questioned on sleep and demographics to assess the prevalence of SDB and its risk factors. An abnormal SDB questionnaire score was identified in 2.5%. The respondents reported sleep durations of 7.61 and 8.27 hours during weekdays and weekends, respectively. There were increases in snoring, witnessed apnoeas and daytime somnolence as age increased. Habitual snoring was highly prevalent, affecting 53.8% and 38.3% of the male and female respondents, respectively. Independent risk factors for snoring were male sex (adjusted odds ratio 2 [95% CI 1.6, 2.5]) and BMI (1.08 [1.03, 1.12]).

Comment: This study from Chile recruited more than 2000 adolescents and young adults by performing home visits to administer a number of questionnaires about snoring, witnessed apnoeas and daytime somnolence. It didn’t include a sleep study. Snoring and witnessed apnoeas were prevalent in about 2.5% of the population and increased with age from 15 to 40 years from 0.8% to 3.9%. Most symptoms were more common with male sex, higher BMI, low educational level and increased waist circumference. Bottom line: sleep-related breathing disorders are surprisingly frequent in young adults and adolescents.

Reference: Chest 2016;149(4):981–90

Independent commentary by Professor Lutz Beckert.

Professor Lutz Beckert is the Head of Department of Medicine of the University of Otago, Christchurch. He is also a Respiratory Physician at Canterbury District Health Board.

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Obstructive sleep apnoea in the elderly: role of continuous positive airway pressure treatment

Authors: Martinez-Garcia MA et al.

Summary: Consecutive patients aged ≥70 years with severe OSA (AHI ≥30) were randomised to CPAP (continuous positive airways pressure; n=115) or no CPAP (n=109) for 3 months and underwent sleep studies in this open-label trial. An intent-to-treat analysis showed that compared with no CPAP, CPAP was associated with significantly greater QOL improvements in all domains, sleep-related symptoms, anxiety and depression indices and some neurocognitive tests.

Comment: These Spanish authors focus on the age group of over 70 years to dispel the myth that sleep apnoea may be less serious in the elderly. They report on an RCT of about 200 patients, aged 70 years or older, with an average BMI of 32 kg/m² and a baseline AHI of 50. The result is so convincingly positive that Donald Bliwise in his editorial carefully explores where the misperceptions surrounding sleep apnoea in the elderly may have arisen from. Bottom line: CPAP treatment in the elderly improves daytime tiredness, night-time symptoms, social function, cognitive function and lowers blood pressure. Elderly patients tolerate CPAP well.


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Role of nasal positive end expiratory pressure valve as an alternative treatment for obstructive sleep apnoea in Chinese patients

Authors: To KW et al.

Summary: These researchers recruited 196 patients with symptomatic OSA who had declined CPAP to have a nasal PEEP (positive end expiratory pressure) valve attached to each nostril prior to sleep. A 1-week acclimatisation period was followed by another 4 weeks of treatment; 23% failed acclimatisation and 7% withdrew from the study. Among participants with evaluable polysomnograms at 4 weeks (n=120), 60% and 63% had >50% reductions in mean overall AHI (from 26 to 18) and mean supine AHI (from 31 to 11), respectively (p<0.001). Compared with responders, participants with a <50% reduction in AHI had greater mean overall AHI (30 vs. 23 [p=0.033]), greater mean supine AHI (35 vs. 26 [p=0.04]), a lower mean oxygen desaturation nadir (76.7% vs. 82.7% [p=0.01]) and a longer mean period of SaO₂ <90% (p=0.02). Nasal PEEP was also associated with a greater reduction in supine AHI than seen with MADs (29 vs. 16). The most common adverse events with nasal PEEP were breathing discomfort and dry mouth.

Comment: Nasal PEEP valves have recently been approved by the US FDA to treat sleep apnoea. They are simple devices with self-adhesive tape designed to attach to each nostril to produce nasal PEEP. These Hong Kong authors report the results of a 4-week trial comparing nasal PEEP with MADs, carefully monitored by polysomnography. The nasal PEEP valve showed an improvement in the AHI of about 50%; it was more successful in less severe sleep apnoea and positional sleep apnoea. Bottom line: nasal PEEP valves were similar to MADs and could be considered for treatment in mild sleep apnoea.

Reference: Respirelogy 2016;21(3):541-5

A randomized controlled study to examine the effect of a lifestyle modification program in OSA

Authors: Ng SSS et al.

Summary: Patients with moderate-to-severe OSA (n=104) were randomised to a dietician-attached to each nostril

The lifestyle modification programme was also associated with modest improvements in mental health on the Short Form Health Survey, and also improvements in eating behaviour with the lifestyle modification programme in a per-protocol analysis (–3.5 vs. –1.1 [p=0.004]). The lifestyle modification programme was also associated with a greater mean reduction in BMI (–1.8 vs. –0.6 kg/m² [p=0.001]); a reduction in daytime ESS score was greater with the lifestyle modification programme in a per-protocol analysis (–3.5 vs. –1.1 [p=0.004]).

Comment: In this Hong Kong based trial, the authors report on the beneficial effects of a weekly lifestyle modification programme on weight loss, wellbeing, daytime sleepiness and sleep apnoea. With each 1-point loss in the BMI, the AHI improved by 3 points. As the accompanying editorial points out, this fairly aggressive regimen may have beneficial effects by improving CV risk. Weight loss counselling, as part of sleep apnoea management, is a marker of quality care of the treatment provider. Bottom line: lifestyle modification can reduce sleep apnoea and decrease daytime sleepiness.


Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages

Authors: Colchero MA et al.

Summary: These researchers analysed observational beverage purchase data from 6253 Mexican households providing 205,112 observations to explore the impact of an excise tax imposed on sugar-sweetened beverages. Compared with estimates of beverage purchases if the tax had not been introduced (counterfactual), a decrease of 6% on average, equating to 12mL per capita per day, was associated with the tax, and the decrease occurred at an increasing rate up to a 12% decline at the end of the 3-year evaluation period. Reductions in taxed beverage purchases were seen across socioeconomic groups, but were higher for low socioeconomic status, with an average decline of 9% increasing to 17% at the end of the evaluation period, compared with pretax trends. Untaxed beverage purchases (mainly bottled plain water) increased by 4% (36mL per capita per day) higher than the counterfactual.

Comment: Mexico and NZ have some of the highest prevalence rates of obesity in the world. In September 2013, the Mexican congress passed a tax on sugar-sweetened beverages of 1 peso per litre – about a 10% price increase. The tax was collected from the manufacturers, who passed on the exact amount to the consumers. In this early report based on more than 200,000 observations, the purchase of taxed beverages reduced by about 6%. This can inform our current debate in NZ (see NZ Herald). Bottom line: the tax on sugar-sweetened beverages is associated with a reduction in purchase of these beverages; it is too early to assess the health implications.

Reference: BMJ 2016;352:h6704

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Sleep-disordered breathing and incident heart failure in older men

Authors: Javaheri S et al., for the Osteoporotic Fractures in Men Study Research Group

Summary: In this longitudinal study, 2865 enrollees in the Osteoporotic Fractures in Men Study underwent baseline polysomnography and were prospectively followed for incident or decompensated HF over a mean 7.3-year period. The main exposure was obstructive AHI, CAI (central apnoea index) and Cheyne-Stokes breathing. Incident HF was predicted by CAI ≥5 (adjusted HR 1.79 [95% CI 1.16, 2.77]) and presence of Cheyne-Stokes breathing (2.23 [1.45, 3.43]), but not obstructive AHI. The risk of incident HF was attenuated for those with CAI ≥5 after excluding men with baseline HF (HR 1.57 [95% CI 0.92, 2.66]), but the association with Cheyne-Stokes breathing remained significant (1.90 [1.10, 3.30]).

Comment: This North American study led by a group from Harvard contributes to our understanding of the interplay between sleep apnoea and HF. The authors followed a cohort of almost 3000 participants from an osteoporotic fracture study for 7 years. After adjusting for common cardiac risk factors, SDS did not predict the development of overt HF. As Matthew Naughton points out in his editorial, the bottom line is: Cheyne-Stokes breathing or CSA predicts the development of HF. We don’t know whether we can prevent HF by treating it or if Cheyne-Stokes breathing is a protective mechanism.

Abstract

Comparison of the effects of continuous positive airway pressure and mandibular advancement devices on sleepiness in patients with obstructive sleep apnoea

Authors: Bratton DJ et al.

Summary: This was a network meta-analysis of 67 RCTs (n=6873) comparing CPAP and MADs (mandibular advancement devices) with inactive controls in patients with OSA. Compared with inactive controls, CPAP and MADs reduced ESS (Epworth Sleepiness Scale) scores by 2.5 and 1.7 points, respectively. CPAP was estimated to reduce ESS score by 0.8 points more than MADs, but a possibility of publication bias in favour of CPAP might have been responsible for this difference. Studies reporting greater CPAP adherence also reported greater treatment effects.

Comment: These Swiss authors report the efficacy of treatment with CPAP and MADs in almost 7000 patients from 67 studies. They carefully consider a possible recruitment bias, as not many studies explored MADs in patients with severe disease, note the weakness that a huge variety of MADs are used, which may not all be equally effective, and suggest that the ESS may not be the best outcome measurement. Given these caveats, the authors and accompanying editorial conclude – bottom line: CPAP seems more effective than MADs to treat sleep apnoea. However, MADs are an effective treatment alternative for patients who cannot tolerate CPAP.

Abstract

Adaptive servo-ventilation for central sleep apnoea in systolic heart failure

Authors: Covey MR et al.

Summary: Patients with CSA, left ventricular ejection fraction ≤45%, AHI of ≥15 events per hour and a predominance of central events (n=1325) were randomised to receive guideline-based medical treatment with or without adaptive servventilation. The mean AHI at 12 months was 6.6 events per hour in the adaptive servventilation arm. No significant difference was seen between the adaptive servventilation and control arms for the primary composite endpoint of death from any cause, lifesaving LV intervention or unplanned hospitalisation for worsening HF (54.1% vs. 50.8% [p=0.10]), but adaptive servventilation was associated with higher risks of all-cause and CV mortality (respective HRs 1.28 [95% CI 1.06, 1.55] and 1.34 [1.09, 1.65]).

Comment: The physiological results from this Harvard study may explain the negative finding of the use of BiPAP (bilevel positive airway pressure) via adaptive servventilation for CSA in patients with HF. If this hypothesis is correct, that the respiratory alkalosis caused by Cheyne-Stokes breathing protects the heart from the adverse effects of acidosis, then the results of this study are not surprising. While we need to keep in mind that this may be a spurious result idiosyncratic to one device, it shows the power of RCTs. Bottom line: adaptive servventilation may increase overall and cardiac mortality in patients with HF.

Abstract

A Bayesian cost-effectiveness analysis of a telemedicine-based strategy for the management of sleep apnoea

Authors: Isbetta V et al., the Spanish Sleep Network

Summary: Patients with OSA requiring CPAP (n=139) were randomised to telemedicine-based or standard face-to-face CPAP follow-up and questioned about sleep, CPAP side effects and lifestyle at 1, 3 and 6 months. Six-month outcomes showed between-group similarities for CPAP compliance and improvements in daytime sleepiness, QOL, side effects and satisfaction. Despite more visits, telemedicine was more cost effective, with savings in indirect costs.

Comment: This Spanish study is relevant to the NZ situation where a large population live rurally without easy access to subspecialty medicine. The researchers report on an RCT of 140 patients with severe sleep apnoea treated with CPAP, who received standard follow-up in a sleep clinic or follow-up via telemedicine using Skype. The savings achieved in this study are mainly for the patients, including reduced travel and travel cost, but not necessarily for the healthcare provider. Bottom line: telemedicine can improve patient compliance, sleepiness and QOL in a cost-effective manner compared with traditional face-to-face follow-up.

Abstract

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