Welcome to the latest issue of Sleep Medicine Research Review.

Highlights include a NZ study of sleep hygiene practices and sleep quality in adolescents, a comparison of melatonin and bright light treatment in children with chronic sleep onset insomnia, and a well-designed study comparing positional therapy with oral appliance therapy in patients with position-dependent sleep apnoea. We also report the long-term benefits of therapist-guided internet-based CBT for insomnia, an association between REM sleep behaviour disorder and cognitive impairment in Parkinson disease, and the impact of binge viewing on sleep.

We hope you find these and the other selected studies interesting, and welcome your feedback.

Kind regards,

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Gender differences in sleep hygiene practices and sleep quality in New Zealand adolescents aged 15 to 17 years

Authors: Galland B et al.

Summary: This NZ study compared sleep hygiene practices and sleep quality in male and female adolescents. 692 adolescents (59% girls, mean 16 years) completed the Pittsburgh Sleep Quality Index and Adolescent Sleep Hygiene Scale online, and supplied information about their height, weight, evening technology use and caffeine consumption. Poor sleep quality was reported by 56% of participants, and was more common in girls than boys (63.1% vs 44.5%). Sleep hygiene was also worse in girls. More girls than boys drank hot caffeinated drinks after dinner (51.8% vs 38.1%), and more boys drank energy drinks (12.1% vs 9.2%). Caffeine after dinner increased the odds of a poorer score for daytime dysfunction (p=0.002). A 1-hour increase in evening technology time significantly increased the odds of poor sleep efficiency, and a 1 z-score increase in body mass index significantly increased the odds of poor sleep efficiency and long sleep latency.

Comment (AN): Kiwi girls (kōhine) are using more caffeine than boys (tamariki tāne) contributing to poorer sleep quality and longer sleep onset time. Technology use before sleep is a growing issue with both genders averaging 1 hour 40 mins – those with the highest tech use had the poorest sleep.

Reference: Sleep Health 2017;3(2):77-83

Effects of melatonin and bright light treatment in childhood chronic sleep onset insomnia with late melatonin onset

Authors: van Maanen A et al.

Summary: This study compared the effects of melatonin with those of bright light treatment in children with chronic sleep onset insomnia and late melatonin onset. 84 children (mean age 10 years, 61% boys) completed a baseline week then received melatonin, bright light treatment or placebo pills for 3–4 weeks. Sleep was measured daily using sleep diaries and actigraphy. Both melatonin treatment and light therapy decreased sleep latency and improved sleep onset, although melatonin had stronger effects on sleep onset than light therapy. Melatonin treatment improved dim light melatonin onset and had positive effects on sleep latency, sleep efficiency, and sleep time. However, wake after sleep onset increased in the melatonin group.

Comment (AN): In this study the children were referred to a chronobiology sleep centre because of difficulty initiating sleep. Bright light therapy affected mainly subjective outcomes whereas melatonin treatment had more robust objective effects on sleep. The authors recommend melatonin as the preferred treatment for use in clinical practice.

Reference: Sleep 2017; published online Jan 30
A randomized, controlled trial of positional therapy versus oral appliance therapy for position-dependent sleep apnea

Authors: Benoist L et al.

Summary: This study compared the effects of positional therapy and oral appliance therapy (OAT) in patients with position-dependent sleep apnoea. 91 patients with mild to moderate positional OSA (AHI 5–30 events/h) were randomised to positional therapy or OAT for 3 months. Polysomnography was performed at baseline and again at study end. Intention-to-treat analysis showed a reduction in median AHI in both groups: from 13.0 to 7.0 events/h in the positional therapy group (p<0.001) and from 11.7 to 9.1 events/h in the OAT group (p<0.001). Mean adherence (≥4 h/night, ≥5 days/week) was 89.3% in the positional therapy group and 81.3% in the OAT group.

Comment (AN): Positional OSA occurs in around 40% of patients and is a particular feature in mild to moderate severity disease. Sleep position measurement is routinely provided by level 3 cardio-respiratory home or higher sleep studies and helps define this important clinical trait that in turn predicts a good response to mandibular advancement splints or positional therapy. This well-designed, randomised parallel arm study showed positional therapy using a supine detection vibrating position retainer was as effective as OAT at reducing AHI and better tolerated (higher use, less side effects) over 3 months. The ability to objectively confirm adherence with both therapies strengthens the findings. Combining therapies in selected patients makes clinical sense.

Reference: Sleep Med 2017;34:109-17

Abstract

Impact of age on intermittent hypoxia in obstructive sleep apnea

Authors: Bostanci A et al.

Summary: This study determined the impact of aging on intermittent hypoxia in patients with OSA. 1280 consecutive patients who underwent complete polysomnographic evaluation for suspected sleep-disordered breathing at a single centre were included. A propensity score-matched analysis was performed to obtain matching cohorts of geriatric patients (aged ≥65 years; n=168) and non-geriatric patients (n=168). Study groups were comparable for gender, body mass index, neck circumference, AHI, and severity of sleep disordered breathing. Oximetric variables that represented the duration of chronic intermittent hypoxia were significantly higher in geriatric than non-geriatric patients. Geriatric patients also had significantly lower minimum and mean oxygen saturation than non-geriatric patients.

Comment (AN): This interesting retrospective study shows that when geriatric OSA patients are compared with propensity-matched younger counterparts, the longer obstructive events and greater desaturation suggests relative impairment in arousal responses. The study was retrospective with no outcome data but it’s hard to imagine that these long apnoeas are good for sleep health.

Reference: Sleep Breath 2017; published online Aug 28

Abstract

Safety and efficacy of long-term use of sodium oxybate for narcolepsy with cataplexy in routine clinical practice

Authors: Drakatos P et al.

Summary: This retrospective study assessed the efficacy and safety of sodium oxybate in routine clinical practice in patients with refractory narcolepsy and cataplexy. 90 patients with severe narcolepsy with cataplexy refractory to other treatments who were treated with sodium oxybate at a single centre in 2009–2015 were reviewed. Patients were allowed to take other stimulants and/or anti-cataplectic agents. The Epworth Sleepiness Scale score and the number of weekly cataplexy events were both significantly reduced by sodium oxybate in all patients (p<0.0001). The required maintenance dosage could not be predicted. 60% of patients were able to reduce or stop other medications. Nausea, mood swings and enuresis were the most commonly reported adverse events. 26.6% of sodium oxybate recipients discontinued treatment because of adverse events. Events that led to discontinuation of the drug (particularly psychoses) were associated with increasing age and were observed soon after starting treatment.

Comment (AN): Xyrem® (sodium oxybate) is not available in New Zealand and not likely to be until off patent and subject to generic competition to reduce its cost. This study provides useful clinical follow-up data on its effectiveness at reducing cataplexy, the ability of patients to reduce/come off other medications and the reasons for approximately one quarter of patients stopping therapy.

Reference: Sleep Med 2017;35:80-84

Abstract

Three-year follow-up of insomnia and hypnagogic after controlled internet treatment for insomnia

Authors: Blom K et al.

Summary: This study investigated the long-term effects of therapist-guided internet-based CBT for insomnia (ICBT-i). 148 adults with insomnia were randomised to receive ICBT-i or active control treatment for 8 weeks, and were followed up for 36 months post-treatment. Large pretreatment to post-treatment improvements in insomnia severity were seen in the ICBT-i group; these improvements were maintained during follow-up. The control group showed less improvement from pre- to post-treatment, but between-group differences were not significant at 12 and 36 months post-treatment. 74% of participants no longer had insomnia at 36 months. The control group used significantly more sleep medication and additional insomnia treatments during the follow-up period.

Comment (KF): The value of this study is in demonstrating that treatment gains with guided ICBT-i (8-week duration) are stable 3 years after treatment. Generalisability is limited of course by the study population that was mostly female, non-depressed and in their late 40s. Importantly, this CBT-i protocol also significantly reduced the use of sleep medications compared to an active control treatment (medication tapering was covered in the CBT-i modules). Interestingly, at 3 years the groups had a comparable improvement in insomnia severity. This may have been because those receiving the active control received an intervention with components that have been shown to have positive effects on sleep (mindfulness meditation and relaxation). However, the active control group did use significantly more additional insomnia treatments and sleep medication to get to this insomnia improvement. So, it’s good to know that treatment gains can be a long-term prospect following a course of this version of CBT-i. If I was directing a patient to any form of CBT-i I think a medication reduction plan for those on hypnotics is an important aspect of management to cover.


Abstract

Independent commentary by Associate Professor Alister Neill

Alister Neill is Associate Professor at the Department of Medicine, University of Otago, Wellington School of Medicine; and Respiratory and Sleep Physician at the Department of Respiratory Medicine, Capital and Coast Health. His research interests include the epidemiology and ethnic distribution of obstructive sleep apnoea in New Zealanders and its relationship to cardiovascular disease, new treatment technologies, sleep assessment pathways and the provision of home non-invasive ventilation for respiratory failure. He directs the University of Otago’s WellSleep Laboratory and Research Group and is an Associated Investigator of the Australasian Sleep Trials Network.
REM sleep behavior disorder and cognitive impairment in Parkinson’s disease

Authors: Jozwiak N et al.

Summary: This study evaluated the association between REM sleep behaviour disorder (RBD) and cognitive impairment in patients with PD. 162 individuals (53 PD patients with RBD, 40 PD patients without RBD, and 69 healthy individuals) were assessed using polysomnography, a neurological assessment and an extensive neuropsychological exam. PD patients with RBD performed worse in several cognitive tests than healthy individuals or PD patients without RBD. Cognitive measures for PD patients without RBD were similar to those of healthy individuals. The frequency of diagnosis of mild cognitive impairment was almost 3-fold higher in PD patients with RBD than PD patients without RBD (66% vs 23%; p<0.001). 89% of PD patients with RBD and 58% of PD patients without RBD had subjective cognitive decline (p=0.024).

Comment (KF): RBD is a parasomnia characterised by loss of REM sleep muscle atonia, resulting in motor activity during REM sleep as people “act out their dreams” in an often violent manner. RBD may signal the future onset of a neurodegenerative disease such as PD. It has been estimated that up to 46% of those who have a diagnosis of PD will have RBD when diagnosed with polysomnography. The significance of this is demonstrated in this study which found an almost 3-fold higher frequency of mild cognitive impairment diagnosis in PD-RBD patients compared to PD patients without RBD. The PD-RBD patients had poorer performance on cognitive tasks measuring working memory, visual search, mental flexibility, processing speed, cognitive inhibition, word retrieval and delayed recall of verbal information, and visuospatial organisation compared to PD patients without RBD. Clearly, this is a subgroup of patients (and caregivers) that will require closer monitoring and support. Given the prevalence of the comorbidity, the question to think about is “does my patient with Parkinson disease also have RBD?”

Reference: Sleep 2017; published online Jun 22

Abstract

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Independent commentary by Dr Karen Falloon

Dr Karen Falloon completed her medical training at the University of Auckland Medical School in 2001. She became a fellow of the Royal New Zealand College of General Practitioners in 2009. In 2014 Karen completed her PhD in General Practice for which she investigated the effectiveness of a behavioural treatment for insomnia. She works as a GP specialising in insomnia and as a senior lecturer in the Department of General Practice and Primary Health Care at the University of Auckland. Karen is a member of the Australasian Sleep Association and serves on the GP education subcommittee.

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**Effectiveness of benzodiazepine receptor agonists in the treatment of insomnia: an examination of response and remission rates**

**Authors:** Pillai V et al.

**Summary:** This study examined the real-world effectiveness of benzodiazepine receptor agonists (BzRAs) in patients with insomnia. 193 outpatients (72% female; mean 55.2 years) who were taking a therapeutic dose of BzRA for their insomnia were included. End-points were nocturnal sleep disturbance and Insomnia Severity Index (ISI) scores. 71% of participants used BzRAs at least 5 nights per week. Mean ISI scores were significantly lower when taking BzRAs, but remained in the clinical range. 76.7% of patients responded to treatment, and only 47.7% remitted. 68.9% of participants had a sleep-onset latency >30 minutes and/or wake-time after sleep onset >60 minutes while taking BzRAs. After controlling for gender and untreated insomnia severity, the odds of insomnia persistence despite BzRA use were higher in patients with comorbid medical disorders (odds ratio, 2.39; p<0.05) and comorbid psychiatric disorders (odds ratio, 2.24; p<0.05).

**Comment (KF):** Although this study did have limitations such as recall bias, it was great to see a study looking at clinical effectiveness (real world setting) rather than merely efficacy (clinical trial setting). The bottom line is that in the real world, BzRAs are not fully effective in treating chronic insomnia for a large number of patients (especially those with medical or psychiatric comorbidity, i.e. most of our patients). Zopiclone is a BzRA but was not used by patients in this American study (where zolpidem was the most frequently used BzRA).

Reference: Sleep 2016; published online Dec 26

**Binge viewing, sleep, and the role of pre-sleep arousal**

**Authors:** Exelmans L & van den Bulck J

**Summary:** This study examined the impact of binge viewing on sleep. 423 adults aged 18–25 years (61.9% female) completed an online survey assessing regular television viewing, binge viewing, sleep quality (Pittsburgh Sleep Quality Index), fatigue (Fatigue Assessment Scale), insomnia (Bergen Insomnia Scale), and pre-sleep arousal (Pre-Sleep Arousal Scale). 341 (80.6%) participants identified themselves as binge viewers. Among those who binge viewed, 20.2% had binge viewed at least a few times a week during the past month. Among those considered to be poor sleepers according to the Pittsburgh Sleep Quality Index, one-third (32.6%) had poor sleep quality associated with being a binge viewer. Higher frequency of binge viewing was associated with a poorer sleep quality, increased fatigue and more symptoms of insomnia.

**Comment (KF):** Being neither an “emerging adult” nor a Netflix subscriber, this study made for a fascinating insight into the lives of 18– to 25-year-old binge viewers. Binge viewing was defined as watching multiple episodes of the same series in one viewing. Of the 80% of the sample who reported binge viewing, 20% did it a few times a week or more. In those with poor sleep associated with binge viewing (one-third of the poor sleepers), cognitive pre-sleep arousal fully mediated the relationship. The authors suggest that it is the narrative complexity in the “bingeable” TV shows that left the viewers thinking about the episodes or their sequels after they stopped watching. Frequency of binge viewing appears to be more important than the duration of the binge. This makes sense as the more nights a week you are binge viewing the more nights a week you potentially have an associated difficulty sleeping. Useful advice might be to moderate the binging or to introduce relaxation techniques and/or mindfulness techniques after the session to help the brain “wind down” before bed.

Reference: J Clin Sleep Med 2017;13(8):1001-08

**Sleep during menopausal transition: a 6-year follow-up**

**Authors:** Lampio L et al.

**Summary:** This prospective 6-year follow-up study evaluated the sleep changes that occur in women during menopausal transition. 60 women (mean age 46 years) were included. The women were premenopausal at baseline, and at different stages of menopausal transition at the 6-year follow-up. Polysomnography was used to assess sleep architecture at baseline and follow-up. After controlling for body mass index, vasomotor symptoms and depressive symptoms, aging by 6 years resulted in shorter total sleep time and lower sleep efficiency, and in increased wake after sleep onset, awakenings per hour, and arousal index.

**Comment (KF):** Yes, sleep architecture does change during the menopausal transition but it is not all bad. This study used gold standard polysomnography to look at sleep architecture at a premenopausal baseline and at follow up 6 years later. At follow up, the women had shorter sleep times, lower sleep efficiency, more frequent awakenings and more time awake after controlling for body mass index, vasomotor symptoms and depression symptoms. This sounds dreadful, but if we look at the clinical meaningfulness of the changes, it is an average of 23 minutes less sleep overall and 27 minutes of wake time after sleep onset which is not huge. The study does not tell us what this means in terms of how the women feel or function during the day. Many women will cope just fine with 23 minutes less sleep per night. How awakenings affect us is largely due to how we interpret these and respond to them. Some heartening news from this study is that higher follicle-stimulating hormone level (indicating menopausal transition) was associated with an increased amount of slow wave (deep) sleep. The authors suggest this may be the body’s mechanism to cope with the changes in sleep architecture.

Reference: Sleep 2017; published online May 19

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