Sleep Medicine Research Review™

Making Education Easy

Issue 7 – 2015

In this issue:

Abbreviations used in this issue
OSA = obstructive sleep apnoea
RLS = restless legs syndrome

NZMA New Zealand Medical Association

Welcome to the latest issue of Sleep Medicine Research Review.

The first 3 studies in this issue emphasise the benefits of a good night's sleep – it reduces your chances of catching a cold, increases your pain threshold, and improves your mood! These studies are followed by an interesting report of psychopathology in patients with RLS and two articles of sleep-disordered breathing in children.

We hope you find these and the other selected studies interesting, and welcome any feedback you may have.

Kind regards,

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Dr Karen Falloon karenfalloon@researchreview.co.nz

Behaviorally assessed sleep and susceptibility to the common cold

Authors: Prather A et al.

Summary: This study determined the association between poor sleep and susceptibility to the common cold. 164 healthy volunteers had their sleep duration and continuity assessed for 7 consecutive days using wrist actigraphy and sleep diaries. They were then quarantined, given nasal drops containing rhinovirus, and monitored for 5 days for the development of a cold. Logistic regression analysis showed that shorter sleep duration was associated with an increased likelihood of developing a cold. Compared with participants who slept for more than 7 hours per night, those who slept for 6 hours or less were 4 times more likely to develop a cold. The association was independent of pre-challenge antibody levels, demographics, season, body mass index, psychological variables, and health practices. Sleep fragmentation was not related to cold susceptibility.

Comment (KF): A very topical article to review for this time of year. Sleep duration of less than 6 hours was associated with an increased risk of developing a cold after being inoculated with the rhinovirus. Few participants reported sleep >9 hours so the investigators were unable to determine if long sleep duration was a risk factor. Yet more evidence that obtaining 7–9 hours of sleep per night is beneficial for health.

Comment (AN): A lack of sleep – can it make you sick? This study showed that shorter sleep (<6 hours per night) was associated with a 4-fold increased risk of developing a cold. Study participants were inoculated with a virus under controlled conditions. Only actigraphy-derived objective sleep duration as opposed to self-sleep estimate supported the association. Although this study does not provide direct causal evidence the association was independent of pre-challenge antibody levels, season, smoking, physical activity, alcohol consumption, and psychological variables.

Reference: Sleep 2015;38(9):1353-1359

Abstract

RNZCGP Endorsed CPD Activity

Time spent reading this publication has been approved for CME for Royal New Zealand College of General Practitioners (RNZCGP) General Practice Educational Programme Stage 2 (GPEP2) and the Maintenance of Professional Standards (MOPS) purposes, provided that a Learning Reflection Form is completed. Please **CLICK HERE** to download your CPD MOPS Learning Reflection Form.

College of Nurses Aotearoa NZ

Time spent reading this publication has been approved for CNE by The College of Nurses Aotearoa (NZ) for RNs and NPs. For more information on how to claim CNE hours please **CLICK HERE**.

The effect of sleep deprivation on pain perception in healthy subjects

Authors: Schrimpf M et al.

Summary: This meta-analysis investigated the effect of sleep deprivation on pain perception. A search of PubMed, Cochrane, Psyndex, Psycinfo and Scopus databases identified 15 studies (n=456) that investigated any kind of sleep deprivation in conjunction with a pain measurement. Using a random effect model, the pooled standardised mean differences (SMDs) of sleep deprivation on pain perception were calculated. Sleep deprivation showed a medium effect on pain perception in a between-group analysis (SMD 0.62; p=0.015) and a large effect in a within-group analysis (SMD 1.49; p<0.0001).

Comment (KF): Sleep deprivation increases self-reported pain. For patients with chronic or post-operative pain, optimising sleep would be beneficial for both sleep health and potential reduction in pain. Effective treatment of sleep disorders which may co-exist with chronic pain would therefore be important for pain management in these patients.

Reference: Sleep Med 2015; published online Aug 19
Abstract

Sleep deprivation leads to mood deficits in healthy adolescents

Authors: Short M et al.

Summary: This study examined the impact of sleep deprivation on mood in adolescents. 12 healthy adolescent good sleepers spent 3 consecutive nights in a sleep laboratory where they underwent 2 baseline nights with 10-h sleep opportunities then 1 night of total sleep deprivation. Every 2h during wakefulness they completed the Profile of Mood States – Short Form. Mood across the two baseline days was compared to mood at the same clock time after 1 night without sleep. All mood states (depression, anger, confusion, anxiety, vigour, and fatigue) significantly worsened after 1 night without sleep. Females showed a greater vulnerability to mood deficits after sleep deprivation than males.

Comment (AN): This study forms part of a growing body of evidence showing how sleep deprivation can negatively impact mood. In this study of adolescents, females appeared to have heightened vulnerability. The results highlight the importance of healthy sleep for the well-being of adolescents.

Reference: Sleep Med 2015;16(8):987-993
Abstract

Restless legs syndrome: psychiatric comorbidities are more important than neuroticism

Authors: Trautmann E et al.

Summary: This study investigated the association between RLS and psychopathological symptoms. Psychiatric diagnoses, psychological complaints, sleep and personality traits in RLS patients were compared with those in a control group without sleep disorders. The RLS patients showed more depressive disorders, psychopathological symptoms, and lower well-being than controls, but there were no between-group differences in personality traits. RLS patients tended to have higher neuroticism than controls but this was attributed to higher rates of depression in the former group.

Comment (KF): This article emphasises the need to be alert for psychopathology (especially depression) in those with RLS. However, as the control group consisted of those without sleep disorders, the authors were unable to conclude whether any insomnia caused by the RLS was contributing to the psychopathology. It was interesting to note that higher severity or frequency of RLS symptoms did not predict psychopathology, which suggested the psychiatric symptoms were not simply an expression of the burden of RLS symptoms.

Reference: Behav Sleep Med 2015;13(5):375-86
Abstract

Rapid maxillary expansion (RME) for pediatric obstructive sleep apnea: a 12-year follow-up

Authors: Pirelli P et al.

Summary: This study evaluated the use of rapid maxillary expansion (RME) in children with OSA. 31 children with OSA due to isolated maxillary narrowing were enrolled. 23 of them were followed up annually for a mean of 12 years after the completion of orthodontic treatment at a mean age of 8.68 years. Annual clinical evaluations were consistently normal over time, and polysomnography findings remained normal at the 12-year follow-up.

Comment (AN): RME is a simple orthodontic technique than widens the maxilla, reduces nasal resistant and increases the size of the oral cavity. This is the longest follow-up study of children with OSA selected for RME because of maxillary narrowing without adeno-tonsillar enlargement. Timing is important as the mid-palatal suture starts to fuse in early adolescence. It is encouraging to see sustained improvement in these children.

Reference: Sleep Med 2015;16(8):933-935
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 is now working part time as a general practitioner and part time 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.

Natural history of snoring and other sleep-disordered breathing (SDB) symptoms in 7-year-old New Zealand children: a follow-up from age 3

Authors: Luo R et al.

Summary: This study examined the natural history of snoring and associated symptoms in NZ children. Parents of 839 children who completed a community survey about their child's sleep and breathing at age 3 years were re-contacted 4 years later. Parents were asked to complete a follow-up questionnaire relating to their child's sleep and health (response rate 54.8%). At follow-up, 9.2% of the children were habitual snorers (similar to the 11.3% reported at age 3 years). However, habitual snoring status changed over time after the initial survey; 36.2% of the children remained habitual snorers; 63.8% were no longer snoring habitually, and 5.3% had started habitual snoring. Habitual snoring at follow-up was associated with mouth breathing, sleeping with the neck extended, sweating profusely, night waking, and child irritability.

Comment (KF): This study showed that habitual snoring in children aged 3–7 years is dynamic. Some children with habitual snoring resolve, some persist and some develop habitual snoring over time. These changes are postulated to relate to changes in airway size compared to tonsillar/adenoid size, the development of tonsillar/adenoidal hypertrophy and allergic rhinitis. As sleep-disordered breathing has a potential impact on health, behaviour, and learning the authors suggest annual screening for snoring and sleep apnoea (rather than a one-off check) would aid in early diagnosis and treatment for those who need it.

Reference: Sleep Breath 2015;19:977-985
Abstract

The effect of body position on physiological factors that contribute to obstructive sleep apnea

Authors: Joosten S et al.

Summary: This study investigated the effect of body position on physiological factors that contribute to OSA. 20 patients with continuous positive airway pressure (CPAP)-treated severe OSA were assessed while sleeping in supine and lateral positions. CPAP was dialled-down during sleep to enable measurement of pathophysiological variables. Compared with supine positioning, lateral positioning significantly improved passive airway anatomy/collapsibility, the ability of the airway to stiffen and dilate, and the awake functional residual capacity without improving loop gain or arousal threshold.

Comment (AN): In this detailed study of the different pathophysiological traits in patients with severe OSA these researchers found that moving position from back to side increases lung volume (functional residual capacity) and argue that this helps improve upper airway collapsibility and the ability of the airway to dilate and stiffen. No significant changes occurred in the respiratory arousal threshold or loop gain. Positional therapy does not usually resolve severe OSA but it can be very useful in helping lower the level of CPAP or when used in combination with other therapy such an oral appliance or weight loss.

Reference: Sleep 2015;38(9):1469-1478
Abstract

Simplified sleep restriction for insomnia in general practice: a randomised controlled trial

Authors: Falloon K et al.

Summary: This study recruited 97 adult patients with persistent primary insomnia and no comorbidities attending urban general practice settings in Auckland, New Zealand. Participants were randomised to either a simplified sleep restriction (SSR) intervention providing SSR instructions (restricting time in bed) and sleep hygiene advice, or sleep hygiene advice only (control group). Ninety-four (97%) patients completed the study. At 6 months' follow-up, SSR participants had improved sleep quality as assessed by Pittsburgh Sleep Quality Index (PSQI) scores (6.2 vs 8.4; p<0.001), Insomnia Severity Index (ISI) scores (8.6 vs 11.1; p=0.001), actigraphy-assessed sleep efficiency (between-group difference 2.2%, p=0.006) and reduced fatigue (difference –2.3 units; p=0.04), compared with controls. Compared with sleep hygiene advice alone, SSR was associated with higher rates of treatment response (67% [28 out of 42] vs 41% [20 out of 49]); number needed to treat = 4 (95% CI, 2.0 to 19.0). Controlling for age, sex, and severity of insomnia, the adjusted OR for insomnia remission was 2.7 (95% CI, 1.1 to 6.5). There were no significant between-group differences in other outcomes or adverse effects.

Comment (KF): Obviously I have a conflict of interest with this paper being one of its authors. However, as a clinician it is great to have a paper that gives evidence for the effectiveness of a treatment that can be implemented in a real-world primary care setting. Simplified sleep restriction (SSR) is a version of sleep restriction (or bedtime restriction) that the patient is taught and then self-adjusts. It is based on a simple principle – those with insomnia spend much more time in bed than they actually spend sleeping therefore sleep is fragmented and of poor quality. Giving some boundaries around appropriate bed times and wake up times encourages sleep to occur in one solid, quality chunk and strengthens sleep drive and circadian rhythm. SSR has been shown to improve sleep and reduce fatigue to a clinically meaningful extent. This method can be used by you on your next patient with primary insomnia (chronic insomnia disorder) in your next clinic. I tend to call it 'sleep scheduling' with my patients rather than 'sleep restriction".

Reference: Br J Gen Pract. 2015;65(637):e508-15
Abstract

Subjective perception of sleepiness in a driving simulator is different from that in the Maintenance of Wakefulness Test

Authors: Schreier D et al.

Summary: This study examined whether sleep-deprived, healthy subjects who do not always signal spontaneously perceived sleepiness (SPS) before falling asleep during the Maintenance of Wakefulness Test (MWT) would do so in a driving simulator. 24 healthy subjects aged 20–26 years underwent a MWT for 40 min and a driving simulator test for 1 h, before and after 1 night of sleep deprivation. Subjects were instructed to signal SPS as soon as they felt sleepy. After sleep deprivation, 7 participants (29%) did not signal SPS before falling asleep in the MWT, but all of them signalled SPS before falling asleep in the driving simulator (p<0.004).

Comment (AN): The MWT is an objective measure of the ability to maintain wakefulness under soporific conditions. This interesting study suggests that perception of sleepiness – a critical precursor to avoiding a sleep crash, is task dependent. Sleep-deprived subjects were much better at perceiving their own sleepiness when getting feedback from the driving task. The results support the dogma that "No driver can fall asleep without experiencing prior sleepiness" but do not support the use of the MWT to identify sleepiness misperception.

Reference: Sleep Med 2015;16(8):994-998
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.