



What's hot that the other lot got

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A ROLE FOR REMOTE MONITORING AND AUTOMATED MESSAGING TO BOOST EARLY CPAP USE IN OSA?

Continuous positive airway pressure (CPAP) is the gold standard treatment for obstructive sleep apnoea (OSA) but adherence to treatment can be poor. Telemedicine can provide remote access to adherence data, patient education platforms and enhance follow-up care. This four-arm randomised trial (Hwang *et al. Am J Respir Crit Care Med* 2018;197:117–26) assessed the impact of two interventions, web-based OSA education (Tel-Ed) and CPAP telemonitoring with automated messaging (Tel-TM), alone or in combination (Tel-both) in patients requiring CPAP for OSA and compared their effects on CPAP adherence at 90 days to usual care. CPAP usage was evaluated in 556 patients. Usage at 90 days was significantly higher in both the Tel-TM and Tel-both compared with usual care (both $P=0.0002$). Odds of achieving target adherence ($\geq 70\%$ days with CPAP usage ≥ 4 hours; the level set for reimbursement in US health system) were 2.4 times higher in Tel-both compared with usual care and 1.7 times in Tel-TM. Usage fell in all four groups but the decline was slower in the Tel-TM group. Tel-Ed improved clinic attendance but not usage. Telemonitoring with automated feedback messaging improved 90 days CPAP adherence in OSA. This study demonstrates the need for patient-centred approach to CPAP therapy, to empower patients and maximise the potential of telemedicine.

CPAP COMPLIANCE: IT'S NOT WHAT YOU SAY IT'S THE WAY THAT YOU SAY IT

Long term adherence to continuous positive airway pressure (CPAP) treatment for OSA is suboptimal and can lead to impaired patient outcomes. Improving patient education and focus on rationale of treatment may optimise usage. Pengo *et al (J Thoracic Dis* 2018;10(Suppl 1):S160-S169) determined the effect of positive and negative framed messages on compliance in patients requiring CPAP for OSA. 112 patients with confirmed OSA were randomised to

three arms; positive messages, negative messages or usual care. Framed messages were read out at time of collection of an autotest device (APAP), attached to the machine and repeated on weekly phone calls. Compliance data and symptoms were recorded at 2 weeks. Patients were switched to fixed level CPAP and reassessed 6 weeks later. This study demonstrated improved CPAP compliance and a 50% reduction in dropout rates in the positive framed arm (5 patients) at 8 weeks compared to usual care (11 patients, $p<0.05$). Total number of dropouts was the same in all three groups at 2 weeks. Total number of days of APAP and usage >4 hours at 2 weeks was higher in the positive framed message compared with negative framed message or usual care. Average hours of usage at 8 weeks was similar in the usual care, negative and positive framed groups; 3.1 hrs, 2.6 hrs and 3.5 hrs, respectively. Incorporating framed messages with individualised patient based care could result in improved adherence and patient outcomes.

HYPOXIC LOAD DRIVES BLOOD PRESSURE VARIABILITY IN SEVERE OSA

There is an increased risk of hypertension in patients with OSA but the pathogenesis remains unclear, with the role of apnoeas, hypoxia and arousals on blood pressure variability (BPV) not fully elucidated. Xu *et al (Sleep Breath* 2018. doi:10.1007/s11325-018-1634-6) evaluated dynamic BP changes via pulse transit time during polysomnography (in 104 hypertensive and 97 normotensive patients with severe OSA (apnoea-hypopnea index; AHI >30 events/hr). Event related systolic BP elevation (Δ SBP) was analysed and SBP index was calculated as the number of Δ SBP >10 mmHg/hour of sleep time. Compared with the normotensive OSA patients, hypertensive patients demonstrated increased sleep disruption with all sleep breathing events (all $P<0.001$), increased duration of oxygen desaturations and apnoea/hypopnoeas ($P<0.001$) and had a higher percentage of patients with non-dipper nocturnal BP profile (97.1 vs 75.3%, $P<0.001$). Potential mechanisms of OSA-hypertension were evaluated and hypertensive patients exhibited higher Δ SBP and SBP index compared with the normotensive OSA patients ($P<0.001$). BPV correlated with oxygen desaturation and arousal but less so with oxygen desaturation or arousal alone. Regression analysis suggests both total sleep time with oxygen

saturation $<90\%$ and SBP index correlate with awake and asleep BP whereas ODI, AHI, apnoea/hypopnoea duration or desaturation duration did not. This study showed increased BPV in patients with co-existing hypertension and severe OSA and furthermore that BP correlated better with severity of hypoxic burden than absolute measures of OSA per se.

DIAGNOSTIC ACCURACY OF SIMPLE PULSE OXIMETRY IN PAEDIATRIC OSA CAN BE ENHANCED WITH AUTOMATED ALGORITHMS

OSA is increasingly common in children. The use of in-patient sleep studies is resource heavy but out-patient oximetry lacks sufficient diagnostic accuracy. Automated signal processing and pattern recognition using machine-based algorithms such as linear discriminant analysis (LDA) and logistic regression (LR) have the potential to enhance the clinical utility of pulse oximetry. Crespo *et al (Sleep Breath* 2018. doi:10.1007/s11325-018-1637-3) determined the utility and reliability of LDA, LR and quadratic discriminant analysis (QDA) in pulse oximetry analysis in 176 children undergoing sleep studies with simultaneous reference polysomnography. Analysis of the current reference standard, 3% oxygen desaturation index (ODI3), using QDA, LDA and LR, was evaluated at all three clinical cut-offs (apnoea-hypopnoea index; AHI 1, 3 and 5 events/hr). QDA demonstrated the best screening capability to detect OSA defined as an AHI >1 /hr, with 96.5% accuracy compared with LR achieving 84.3% PPV. Both QDA and LR had similar diagnostic accuracy in the assessment of moderate to severe OSA (AHI >5 /hr), with 82.1% and 82.7%. ROC curve analysis of the conventional screening tool ODI3 demonstrated irregularity and lower diagnostic accuracy compared with QDA, LDA and LR at all clinical cut offs. This study demonstrates that machine learning automatic analysis of overnight oximetry for paediatric OSA is accurate and reliable. QDA was more sensitive and accurate compared with current clinical practice.

Competing interests None declared.

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