

## Podcast of the Journal of Clinical Sleep Medicine

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Welcome to the regular podcast of the *Journal of Clinical Sleep Medicine*. I am Dr. Stuart Quan, editor of the *Journal*. These podcasts are a regular feature of each issue of the *Journal* and can be downloaded at the *Journal's* website. Each podcast features summaries of important articles published in the current issue of the *Journal*, as well as occasional interviews with authors of these papers.

The lead article in this issue of the *Journal* is entitled, "Modafinil Improves Functional Outcomes in Patients with Residual Excessive Sleepiness Associated With CPAP Treatment," by Dr. Terry E. Weaver and Dr. Eileen R. Chasens from the University of Pennsylvania, and Dr. Sanjay Arora from the University of Pittsburgh. Despite CPAP treatment, patients with obstructive sleep apnea frequently continue to have some degree of daytime sleepiness. Previous studies have suggested that the use of modafinil in such patients improves this problem. This study tried to determine whether there was an association with improved functional health status in those patients with the treatment of modafinil. This was a secondary analysis of data obtained from two previous randomized, placebo-controlled studies using modafinil to treat residual sleepiness in patients who were already treated with CPAP for their obstructive sleep apnea. The study included 480 patients in the modafinil group and 188 patients in the placebo group. Functional health status was assessed with the Functional Outcomes of Sleep Questionnaire, or FOSQ. The authors found that, following administration with modafinil, there were greater improvements in both the total score on the FOSQ as well as in four of five individual domains. In addition, 18 of 30 individual FOSQ items improved by at least one point in those individuals receiving modafinil. This study suggests that use of modafinil, in addition to improving daytime sleepiness in individuals who have residual sleepiness after CPAP treatment for sleep apnea, improves healthcare functional status as well.

The next paper to be highlighted in this podcast is entitled, "Iron Stores, Periodic Leg Movements, and Sleepiness in Obstructive Sleep Apnea," by Dr. Louise O'Brien, Julie Koo, Lucy Fan, Jocelyn Owusu, Dr. Wattanachai Chotinaiwattarakul, Dr. Barbara Felt and Dr. Ronald Chervin from the University of Michigan. During polysomnography in patients with obstructive sleep apnea, periodic leg movements are frequently observed. It is unclear whether these leg movements are associated with any significant clinical symptoms. Periodic leg movements are also frequently seen in patients with restless

leg syndrome. In restless leg syndrome, there is an association with iron deficiency, and administration of iron in such patients improves their restless legs. However, it is not known why patients with obstructive sleep apnea frequently exhibit periodic leg movements. This study examined the hypothesis that obstructive sleep apnea could promote lower total body iron stores and thus result in the occurrence of periodic leg movements in patients with obstructive sleep apnea. In this study, 80 patients had both polysomnography and measurement of serum ferritin levels. The mean respiratory-disturbance index was 29.4, periodic leg movement index 7.8 and ferritin level 130. The authors found that there was no relationship between the severity of sleep-disordered breathing or obstructive sleep apnea, and serum ferritin levels. Thus, it does not appear that obstructive sleep apnea is an etiologic factor in producing low ferritin levels and consequently periodic leg movements observed frequently in such patients.

The next paper to be discussed is entitled, "A Multi-Center Prospective Study of a Novel Nasal CPAP Device in the Treatment of Obstructive Sleep Apnea: Efficacy and 30-Day Adherence," by Dr. Leon Rosenthal, Dr. Clifford Massie, Diana Dolan, Bryan Loomas, Dr. Jerrold Kram, and Dr. Robert Hart from Sleep Medicine Associates of Texas in Dallas, Texas, Chicago Sleep Group, Elk Grove Village, Illinois, University of North Texas, Denton, Texas, the California Center for Sleep Disorders, Alameda, California, and Ventus Medical, Inc., Del Monte, California. Although nasal or full-face CPAP is effective therapy for the treatment of obstructive sleep apnea, only approximately two-thirds of patients will wear the device on a long-term basis. Thus, alternative treatment modalities are needed. In this study, a commercially available, one-way nasal valve that provided expiratory positive airway pressure was inserted into both nostrils in patients with obstructive sleep apnea. Adherence and efficacy was then studied over a 30-day time duration. 28 out of 47 subjects ultimately completed the 30-day trial. The apnea-hypopnea index, on average, was reduced from 24.5 to 13.5 after initial treatment and was 15.5 at the end of the 30-day trial. In addition to a response in the apnea-hypopnea index, the percent of snoring also decreased during the 30-day period as well as the Epworth Sleepiness score. The Pittsburgh Sleep Quality Index improved and the mean oxygen saturation increased as well. Although these results are certainly promising, enthusiasm must be tempered because there was significant heterogeneity in patient responsive-

ness. While some patients had a significant improvement in their obstructive sleep apnea, others did not have any at all. In addition, improvement did not appear to be related to the baseline degree of sleep apnea. Some severe patients improved, whereas some relatively mild patients did not. It appears that further studies will be required to determine who may benefit from the use of this device.

In an editorial by Dr. David White from the Division of Sleep Medicine at Brigham & Women's Hospital in Boston, Massachusetts, Dr. White discusses four issues regarding this paper. First, he proposes mechanisms as to why expiratory positive airway pressure might actually improve sleep apnea. It is his contention that expiratory positive airway pressure is causing auto-PEEP and that the auto-PEEP is providing a mild distending pressure at the end of expiration that continues somewhat during the inspiratory phase. In addition, he indicates that auto-PEEP will also increase lung volume, which by itself decreases the tendency for the airway to collapse. The second issue he discusses is the same one that I raised. It is unclear how effective this therapy is. It is not universally effective in all patients. The third concern is a natural extension of the second in that it is unclear why some patients appear to respond and others do not. He suggests that its variability is related to how an individual responds to increments in expiratory resistance. He indicates that some patients may aggressively try to activate expiratory muscles when expiratory resistance is applied so that lung volume does not increase and expiratory positive airway pressure is minimized. These individuals would not respond to this therapy. Lastly, he asks what future research is needed. He suggests that the effectiveness of the device for long-term use that is greater than 30 days needs to be determined in controlled trials. Furthermore, while no

patient appeared to experience a serious adverse affect from this therapy, physicians who prescribe it for extended periods need to closely monitor their patients.

The final paper to be discussed in this podcast is entitled, "Medical Complaints Are More Common in Young, School-Aged Children with Parent-Reported Insomnia Symptoms," by Dr. Ravi Singareddy, Dr. Sumana Moole, Dr. Susan Calhoun, Dr. Peter Vocalan, Marina Tsaoussoglou, Dr. Alexandros Vgontzas, and Dr. Edward Bixler from Penn State University in Hershey, Pennsylvania. This report is from the Penn State Children's Cohort, in whom children underwent polysomnography, completion of a number of questionnaires, and extensive neuropsychological testing. In this study, they evaluated the occurrence of insomnia symptoms with various medical symptoms and disorders. This was a cross-sectional analysis of 700 children, ages five to twelve years. They compared 135 children with 2 parent-reported sleep disturbances to 565 children with no parent reported sleep disturbances. They found that insomnia symptoms were significantly associated with gastrointestinal regurgitation and headaches after controlling for various demographic variables, as well as sleep-disordered breathing. They observed that children with gastrointestinal regurgitation and headaches were 3.3 and 2.3 times more likely to suffer sleep disturbances in comparison to those children without these medical symptoms. They suggest that these results emphasize the importance of physicians inquiring about insomnia symptoms when evaluating children with medical complaints.

This concludes the regular podcast of the *Journal of Clinical Sleep Medicine*. The listener is encouraged to read the contents of the *Journal* for additional information regarding each of the papers summarized in this podcast, as well as other papers published in this issue of the *Journal*.