

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.

I am pleased to have, as a guest for this podcast, Dr. Pooja Budhiraja, who is the first author for the lead article of this issue of the *Journal*, entitled, "Incidence of Restless Legs Syndrome And Its Correlates."

Dr. Quan: Dr. Budhiraja, what are the main findings from your study?

Dr. Budhiraja: The aim of my study was to assess the incidence of RLS and its correlates in a community-based cohort. My study participants from Tucson's cohort of Sleep Heart Health Study answered questions on RLS on two surveys, four years apart. All participants were over 40 years old. I found that the annual incidence of RLS with symptoms of at least five days a month and associated with at least moderate distress was 1.7%. The use of estrogen pills and presence of obstructive lung disorder, at baseline were associated with three-fold higher risk for RLS during the follow-up period. Furthermore, the participants with incident RLS were most likely to have insomnia and a higher sleeping pill use on follow up survey than those who did not.

Dr. Quan: The study found that the incidence of RLS was associated with estrogen use and obstructive lung disease. What do you think are the explanations for these findings?

Dr. Budhiraja: There is some prior literature that is suggestive of the role of estrogen in RLS associated with pregnancy. Increased problems with RLS are seen in pregnancy and problems increase with each pregnancy, and this may be due to higher levels of estrogen in pregnancy. The estrogen may decrease dopamine action in the basal ganglia by acting directly on the dopamine receptor or via increasing turnover of brain stem noradrenaline with a consequent promotion of RLS symptoms. As for COPD, the current study confirms an association between COPD and RLS. One study found a three times higher prevalence of RLS in subjects with COPD. In another study, RLS was more frequent in subjects with COPD, especially those with late stages of disease and was associated with more severe

daily obstruction than hypoxia. The increased prevalence of RLS has also been associated with other lung conditions, such as sarcoidosis, pulmonary hypertension and lung transplant recipients. While the nature of this association between COPD and RLS is unclear, it may be hypothesized that hypoxemia is a contributing factor. Notably, recent literature demonstrates that hypoxic pathways, especially hypoxia inducible factor one, may be activated in RLS. Hypoxia inducible factors increase both tyrosine hydroxylase and vascular endothelial growth factor. Both of these changes have been documented in subjects with RLS. It is possible that hypoxia associated with COPD or other lung disorders could activate similar pathways and contribute to RLS.

Dr. Quan: That's very interesting. I hope that further research can be done in this area. Thank you very much for being a guest on this podcast and discussing your interesting study.

Dr. Budhiraja: Thank you.

The next paper to be discussed in this podcast is entitled, "Diagnostic Delay In REM-Sleep Behavior Disorder (RBD)," by Carolyn White, Elizabeth Hill, Ian Morrison, and Renata Riha from the Department of Sleep Medicine, Royal Infirmary of Edinburgh, Edinburgh Scotland and the Department of Neurology, Institute of Neurological Sciences, Glasgow, Scotland. REM-Sleep Behavior Disorder is a parasomnia characterized by dream enactment and loss of skeletal muscle atonia during REM sleep. Individuals afflicted with this disorder frequently will flail their limbs, causing injury to themselves or their bed partner. It is frequently co-morbid with Parkinson's Disease or Lewy body dementia. In this study, the investigators determined whether there was a delay in making the diagnosis of this disorder. They attempted to survey 49 patients in their tertiary referral center and had a response rate of 65%, or 32 respondents. They found that the average delay in making the diagnosis of REM-Sleep Behavior Disorder was 8.7 years. Women were more likely to have a diagnostic delay than men. The most common reason for this delay among the patients was the belief that the symptoms were not sufficiently serious to consult a physician. This occurred in 59% of the respondents. Other common reasons for not seeking medical attention were the relative infrequency of the symptoms, the belief that the symptoms would eventually subside and the failure to realize that there might be a treatment for the symptoms. Most striking was that

31% of the patients were never asked about their sleep by their physician. 81% of the respondents reported that they had comorbid sleep disorders. The most common of these sleep disorders was obstructive sleep apnea and most of these individuals were also using CPAP. Some of the CPAP users indicated that treatment for their sleep apnea improved their RBD symptoms. This suggests that obstructive sleep apnea accounted for some of the abnormal motor activity during the night. The authors suggest that there is a need for increasing awareness of REM-Sleep Behavior Disorder among the general populace, as well as among practitioners.

The third paper that I would like to highlight is entitled, "Spousal Involvement In CPAP: Does Pressure Help?" The authors are Kelly Baron, Heather Gunn, Laura Czajkowski, Timothy Smith and Christopher Jones from the Department of Neurology, Northwestern University, Chicago, IL, Department of Psychology, University of Utah, and Departments of Psychiatry and Neurology, University of Utah, School of Medicine, Salt Lake City, UT. Obstructive sleep apnea is a common condition, which causes substantial morbidity in terms of reduction in quality of life and increased risk of other medical conditions such as hypertension, coronary artery disease and diabetes. Continuous positive airway pressure, or CPAP, is an effective treatment for obstructive sleep apnea, but many patients fail to adhere to therapy. Pressure by their spouse or bed partner is a frequent reason why patients with obstructive sleep apnea eventually seek treatment. However, there are few data that have investigated whether spousal involvement in the use of CPAP will improve adherence to therapy. This study investigated the role of spousal involvement in CPAP adherence in 23 male obstructive sleep apnea patients. Questionnaires were used to assess spousal involvement when just starting CPAP and then three months afterwards. Adherence data were available in most of the study participants. The most important finding from the study was that spouses who had some collaborative involvement with the partner's CPAP unit resulted in greater CPAP adherence at three months. Although this study was limited by a small sample size and incomplete follow up on all the participants, it does suggest that it is important to have involvement of bed partners or spouses in the initiation of CPAP therapy in patients who have such a living relationship. The authors emphasize that further research into the role of spouses or bed partners in CPAP adherence is necessary.

The final study to be summarized in this podcast is entitled, "Refill Rates Of Accessories For Positive Airway Pressure Therapy As A Surrogate Measure Of Long-term Adherence," by Nimesh Patel, Afshin Sam, Alexandra Valentin, Stuart Quan and

Sairam Parthasarathy from the Southern Arizona Veterans Affairs Healthcare System, Department of Medicine, and Arizona Respiratory Center, University of Arizona, Tucson, AZ and the Division of Sleep Medicine, Harvard Medical School, Boston, MA. Though continuous positive airway pressure is an effective therapy for obstructive sleep apnea, adherence to therapy remains a major problem in treatment. On average, only two out of every three patients with obstructive sleep apnea will use CPAP on a long-term basis. A download of adherence data directly from the CPAP devices is the most accurate measure of CPAP utilization by patients. However, in some cases this is not possible because of failure of the machine to accurately download the data or because the device does not have this capability. Thus, an alternative method of ascertaining adherence would be useful. In this study, investigators attempted to determine whether refills of PAP accessories, such as masks, hoses and filters would be a useful surrogate measure of determining adherence. Data were obtained from 220 consecutive patients at the Southern Arizona Veterans Affairs Healthcare System. An initial derivation data set of 100 consecutive patients were initially analyzed. In this initial data set, PAP refill rate was greater in adherent patients as determined by their CPAP download than non-adherent patients. Furthermore, adherence to CPAP therapy measured as minutes of usage per day was correlated with refill rates for masks. Receiver operating characteristic curves were plotted from the derivation data sets and threshold values of the refill rates associated with the best sensitivity and specificity were calculated. These threshold values were then used in a validation data set of 120 consecutive patients to determine whether they were good predictors of adherence. In this second analysis, the refill rate of all PAP-related accessories had the best positive predictive value for long-term adherence. In a multivariate analysis, higher AHI and greater number of PAP accessory refills were associated with greater adherence to therapy. This study is the first to demonstrate the association of PAP accessory refills with adherence to CPAP. It's strength is that the follow-up time period is quite long, ranging from one to seven years. However, it was done at a VA healthcare facility and thus it is generalizable only to a population of middle to older aged men. In addition, in the current U.S. healthcare system, obtaining data on refill of PAP accessories is difficult because of the fragmented nature of American healthcare delivery.

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 articles summarized in this podcast, as well as other papers published in this issue of the *Journal*.