

## The Pursuit of Happiness: Sleep Apnea, Sex, and Sleepiness

Commentary on Reishtein et al. Outcome of CPAP Treatment on Intimate and Sexual Relationships in Men with Obstructive Sleep Apnea. *J Clin Sleep Med* 2010;6:221-226.

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Obstructive sleep apnea syndrome (OSA) is associated with a variety of health-related consequences. The cardiovascular effects of obstructive sleep apnea, for example, have been found to be very significant, affect morbidity and mortality, and are the subject of much research. However, more subtle but equally important, effects on the individual's overall enjoyment and happiness with life have been investigated as well. Fatigue, sleepiness, non-restorative sleep, and cognitive impairment in patients with OSA adversely affect enjoyment of the pleasurable activities of life. A significant impact on overall quality of life, as measured by reduced scores on questionnaires such as the frequently used Short Form 36 (SF-36) or the Short Form 12 (SF-12) questionnaires, has often been observed in large studies.<sup>1</sup> Moreover, OSA has a significant impact on the spouses' or partner's quality of life as well. Beninati et al. reported that the snoring of the patient with OSA was associated with bedpartner's arousals from sleep, which adversely affected the partner's sleep quality.<sup>2</sup> Other studies have demonstrated the bed partner's overall quality of life is adversely affected by OSA and improves when the patient is treated with continuous positive airway pressure (CPAP).<sup>3,4</sup> Intimate and sexual relationships are especially important to many people and represent a major part of the enjoyment of life. Conditions that affects the quality or duration of sleep could be expected to affect intimate relationships. In this context, the study by Reishtein et al.<sup>5</sup> is especially relevant and important. Little work of this quality has been done in this area of sleep research. Reishtein et al. studied patients with OSA and analyzed the scales on the Functional Outcomes of Sleep Questionnaire (FOSQ) that assess Intimacy and Sexual Relationships. The FOSQ has been widely used in many research studies for many years, and has been validated many times. Patients were recruited from seven sleep centers in North America, and all had at least moderately severe OSA, defined as an apnea-hypopnea index (AHI)  $\geq 20$  events per hour. Patients with comorbidities such as sedative-hypnotic use, cerebrovascular accident, chronic obstructive pulmonary disease, other pulmonary disease, or congestive heart failure, were excluded, which allowed the investigators to focus on the outcomes related to OSA. Diabetes, antihypertensive use with beta-blockers, or history of urological disease, such as prostatectomy, were not recorded raising the possibility these conditions played a role in the study. Patients had polysomnography as part of their routine medical care, and either had a full

night CPAP titration study or a split night study. In addition, the FOSQ and the Psychomotor Vigilance Task were administered, and a multiple sleep latency test (MSLT) was done. The FOSQ has several scales which can be used independently, and in this study the Intimacy and Sexual Relationship scale was specifically analyzed. Adherence with CPAP was measured objectively. Study subjects were 123 obese white males with severe OSA but without significant comorbidities. Mean AHI in this group was 66.9 events per hour, with a range of 20-155.9. This represents a group of patients with very severe OSA, and the findings may or may not apply to individuals with less severe disease. Subjects were divided into three groups for the analysis based on AHI: 20-39, 40-59, and 60 or more events per hour. The baseline score on the Intimacy and Sexual Functioning Scale was significantly lower than normal; however there were no significant differences between disease severity groups. The mean MSLT score was 7.26 minutes, indicating these patients were sleepy. However, an interesting observation is that 30% of these patients with severe OSA had MSLT scores greater than 10 minutes, and furthermore there were no significant differences among the three groups in mean MSLT scores. Epworth Sleepiness Scale (ESS) scores were significantly different between the two most severe groups. Of the entire group with OSA, 63% reported relationship problems, 69% reported reduced desire, 46% reduced arousal, and 29% difficulty with orgasm. There was only a moderate correlation between subjective sleepiness and score on the Intimacy and Sexual Relationship scale, and no significant correlation with sleepiness measured by the MSLT. Following three months of CPAP, mean score on the Intimacy and Sexual Relationship scale improved significantly, but only a weak correlation existed between with days of CPAP usage. Those with the least severe OSA had the smallest change; those with the most severe OSA had the most significant change. Only in the group with an AHI  $\geq 60$  was the improvement statistically significant. The degree of improvement in relationship score was most correlated with both subjective and objective sleepiness, but not correlated with AHI, BMI, or CPAP use. Even after treatment, scores on the Intimacy and Sexual Relationship scale did not return to the normal, suggesting other factors were playing a role. The proportion of patients reporting difficulty with desire, intimacy, arousal, and orgasm improved significantly in the group as a whole. It is also interesting to observe that, baseline compared

with post-treatment, the mean MSLT score also did not change significantly in the two less severe groups, AHI 20-39 and 40-59, but improved significantly only in the AHI  $\geq$  60 group. The Epworth Sleepiness Scale scores improved in all groups.

What can we learn from this study? Male sexual dysfunction may be associated with a variety of causes including age, medical comorbidities, genitourinary disorders, cardiovascular disease, and psychiatric disorders.<sup>7</sup> Previous investigations have focused on the relationship of OSA with erectile dysfunction (ED). This may be only a part of the story. Snoring alone may contribute to sexual relationship dysfunction. Snoring has often been the subject of humor, and is commonly the subject in some comic strips showing the aggravated suffering wife wide awake while her snoring husband sleeps away with the letter 'Z' displayed humorously in the comic. Any noise or disturbance that interferes with sleep, however, has the potential to cause anger and resentment on the part of the sufferer, and it is not difficult to postulate that years of disturbed sleep may cause resentment and anger on the part of the bed partner, which may affect intimate relations. In that context, snoring alone was found to be a risk factor for sexual dysfunction in one study, independent of ED.<sup>7</sup> OSA may cause sleepiness, fatigue, and may be associated with mood or affective disorders, which could lead to loss of interest in intimate relationships. A decrease in overall sexual satisfaction in men has been associated with OSA, however with minimal improvement following treatment with CPAP or oral appliances.<sup>8</sup> OSA has also been associated with ED, which may occur due to a combination of neural, hormonal, and cardiovascular effects which may produce impairment of erectile mechanisms.<sup>9</sup> Of interest, ED has been reported in a murine model of intermittent hypoxia.<sup>10</sup> OSA has been found associated with lower testosterone levels in men compared to controls,<sup>11,12</sup> which may play a role in ED. One investigation found that severe, but not mild, OSA is a risk factor for ED.<sup>13</sup> Moreover, ED associated with OSA may improve with CPAP.<sup>14</sup>

Other factors could play a role in impairment of intimate and sexual relationships. Older age, obesity, diabetes, hypertension, coronary artery disease, antihypertensive agents such as beta blockers, prostatectomy, or other urological conditions are observed frequently in patients with OSA. It can be difficult to sort out these multiple factors that may influence the outcome being studied.<sup>15</sup> Recently, Budweiser et al., studied over 400 patients with ED, and by multivariate analysis, found that OSA was an independent risk factor for ED even when accounting for other risk factors such as diabetes, obesity, and beta-blocking drugs.<sup>16</sup>

Reishtein et al. have made a significant contribution with this study. We have learned from this study that many patients with the most severe forms of OSA have difficulties with intimate and sexual relationships. Only a modest correlation with sleepiness was observed in this study, and CPAP only partially improves these difficulties. However, the clinician can use the results of this study to better understand their patient's disease, and to encourage them to use CPAP. Since many patients seen in sleep medicine practices have less severe OSA, that is, AHI less than 20, it is not clear how the observations in this study

would apply to patients with less severe OSA, and especially the minimally symptomatic patient with OSA. Nevertheless, this is an important study that advances our understanding of how our patients are affected with their disease.

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## SUBMISSION & CORRESPONDENCE INFORMATION

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## DISCLOSURE STATEMENT

Dr. Parish was a site principal investigator for a study by ResMed Corporation at Mayo Clinic and the Mayo Sleep Center in Phoenix, AZ.