

# Apnea Therapy Improves Metabolic Measures

BY SHERRY BOSCHERT

SAN FRANCISCO — Sleep apnea can cause metabolic dysfunction, some of which can be reversed by treating the disorder with continuous positive airway pressure, a small 8-week study of 29 patients suggests.

Nine women with polycystic ovarian syndrome (PCOS) and 20 women without PCOS, all of whom had obstructive sleep apnea, were treated with continuous positive airway pressure (CPAP) at home for 8 weeks. Investigators monitored the use of CPAP to ensure good compliance with therapy, and took metabolic measurements at the start and the end of the study.

Measures of sleep quality improved for the cohort as a whole after treatment. This was accompanied by both nighttime and daytime reductions in catecholamine levels, Dr. David A. Ehrmann said at the Sixth Annual World Congress on Insulin Resistance Syndrome.

"This has important implications in terms of both the metabolic and cardiovascular effects of obstructive sleep apnea in this population," said Dr. Ehrmann, professor of medicine at the University of Chicago.

Sophisticated spectral analysis of heart rate variability as a measure of autonomic function showed that lowered catecholamine levels were reflected functionally in a slowing of heart rate, a lower autonomic function, and a lesser degree of epinephrine-induced variability in heart rate after treatment with CPAP, he added.

In lean subjects, greater compliance with CPAP therapy (the more CPAP they got per hours of sleep) was associated with increased insulin sensitivity.

Obese subjects showed a lesser improvement in insulin sensitivity—but an improvement nonetheless—that also was associated with greater use of CPAP, Dr. Ehrmann said. "There's sort of a dose-response relationship between the use of CPAP and changes in metabolic measurements," he noted.

Among the measures of sleep quality that improved significantly with CPAP therapy, slow-wave sleep activity increased from 59 minutes per night to 72 minutes per night for the cohort as a whole.

The apnea-hypopnea index score decreased from 24 to 2 per hour of sleep. The oxygen desaturation index score decreased from 12 to 1 per hour of sleep. The arousal index score decreased from 27 to 23 per hour of sleep.

Sleep apnea is recognized as a reversible risk factor for hypertension and for a number of abnormalities associated with insulin resistance syndromes. Women with PCOS are predisposed to develop obstructive sleep apnea at a rate sevenfold higher than that of women without PCOS, previous studies suggest. Although obesity plays a role, it does not by itself fully account for the higher risk for sleep apnea in women with PCOS.

Nor does androgen excess explain the higher prevalence of sleep apnea with PCOS, Dr. Ehrmann added. In the nine women with PCOS in his study, 24-hour cortisol levels did not change signifi-



CPAP compliance was linked with improved insulin sensitivity in lean and obese women in a small study of women with and without PCOS who had sleep apnea.

cantly after CPAP treatment compared with baseline.

If hyperandrogenemia is not a major factor in the development of sleep apnea, perhaps low progesterone and relatively low estradiol levels that are characteristic of PCOS contribute to the higher risk for sleep apnea, Dr. Ehrmann suggested.

In a previous study of 53 women with PCOS and 452 controls, the PCOS group was 30 times more likely to have sleep disordered breathing and nine times more likely to have daytime sleepiness after researchers controlled for body mass index. Insulin resistance was a stronger predictor of sleep disordered breathing than was age, BMI, or testosterone levels (J. Clin. Endocrinol. Metab. 2001;86:517-20).

A separate study found that 29 (56%) of 52 women with PCOS and 4 (19%) of 21 controls had obstructive sleep apnea. After adjustment for the effects of BMI, age, ethnicity, and other factors, the risk

for apnea was seven times higher in the PCOS group (J. Clin. Endocrinol. Metab. 2006;91:36-42). In that study, the likelihood of impaired glucose correlated with the severity of sleep apnea.

Dr. Ehrmann and his associates showed that 29 women with PCOS and sleep apnea were significantly more insulin resistant than were 23 women with PCOS but without apnea in a separate study that adjusted for factors including BMI and ethnicity (J. Clin. Endocrinol. Metab. 2008;93:3878-84). Free testosterone levels did not differ between subgroups with no, mild, moderate, or severe apnea.

"It's hard to implicate testosterone as being an important helper for the development of obstructive sleep apnea in women with PCOS," he said.

Dr. Ehrmann reported having no financial conflicts of interest related to these topics. ■

## Sexual Function Is Impaired After Loss of Both Ovaries

BY DOUG BRUNK

SAN DIEGO — Women who underwent bilateral oophorectomy at the time of hysterectomy reported significantly decreased levels of sexual functioning compared with women who underwent hysterectomy with ovarian conservation, results from a survey of 50 women showed.

The findings underscore the potential impact of prophylactic ovary removal on women's sexual functioning, Elizabeth Plourde, Ph.D., said in an interview during a poster session at the annual meeting of the North American Menopause Society.

"The potential for loss of ability to respond sexually is a very important consideration for women who are being advised to do prophylactic oophorectomy," said Dr. Plourde, a psy-

chologist in Irvine, Calif., with research interests in the biochemical and structural changes that arise from reproductive organ removal.

"They're not really being apprised of the significance," she added.

Dr. Plourde and her associates asked 25 women who underwent hysterectomy with ovarian conservation and 25 women who underwent bilateral oophorohysterectomy to complete the Changes in Sexual Functioning Questionnaire-Female (CSFQ-F) and the Sexual Response Questionnaire-Hysterectomy (SRQ-H).

The latter measure was designed for the study to compare the changes in sexual response before and after surgery.

The mean age of the ques-

tionnaire respondents was 49 years.

Only women who had functioning ovaries, based on their responses to survey questions about menopause symptoms,



Women are 'not really being apprised of the significance' before undergoing oophorectomy.

DR. PLOURDE

were retained for the hysterectomy-only group, Dr. Plourde said.

Compared with women who underwent a hysterectomy with ovarian conservation, those who underwent bilateral oophorectomy at the time of hysterectomy had significantly lower scores in total sexual func-

tioning and in the subscale aspects of pleasure, desire/frequency and desire/interest; the number who were orgasmic was also lower among those who had bilateral oophorectomy.

Significant interactions favoring the hysterectomy with ovarian conservation group were also detected before and after surgery in total sexual functioning scores as well as in the subscales of pleasure, desire/frequency, desire/interest, and orgasm/completion.

"I redid all of the calculations to make sure that they were right, because the degree of significance between the two groups surprised me," Dr. Plourde commented.

There were no statistically significant differences between the two groups of women in the rating of the importance of sex before and after surgery.

"The complexity and multifaceted nature of the human sexual response is demonstrated by the fact that not all the women who had their ovaries removed lost their interest in sex or ability to respond sexually, and not all of the women who retained their ovaries maintained their sexual functioning," Dr. Plourde and her associates indicated in their poster.

"These conflicting results indicate there are other factors that influence sexual functioning and need further research," Dr. Plourde noted.

She acknowledged that the small sample size was a limitation of the study.

Dr. Plourde disclosed no conflicts of interest. ■

To see an interview with Dr. Plourde, go to [www.youtube.com/user/ClinicalEndoNews](http://www.youtube.com/user/ClinicalEndoNews).