

## Brief Communication

### Continuous positive airway pressure compliance in Saudi men and women with sleep apnea

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Among the various modalities available for the treatment of obstructive sleep apnea (OSA), continuous positive airway pressure (CPAP) remains the most effective. Nevertheless, there are many factors that limit its usage including the cost, practicality, need for training and acceptance. Even those patients who accept to use CPAP initially may not comply with it later on. Possible reasons include difficulty tolerating high air flow and pressure especially during exhalation, intolerance of the interface, claustrophobia, and nasal irritation.<sup>1</sup> No study has assessed the acceptance and hence compliance to CPAP therapy in Saudi patients with OSA. Additionally, limited data are available in the literature comparing compliance to CPAP therapy in men and women. Therefore, we conducted this study to assess the initial acceptance of CPAP titration in the sleep disorders center (SDC) as well as later compliance to treatment in Saudi patients with OSA, and to explore possible gender differences.

We included 148 Saudi women, and 169 Saudi men with OSA who underwent split night study, during which the final portion of the polysomnography (PSG) was used to titrate CPAP using C-FLEX (REM Star auto-CPAP Respiration, Inc., Murrysville, PA, USA), at the SDC of King Khalid University Hospital, Riyadh, Saudi Arabia, between January 2006 and December 2007. Pressure titration was considered according to a described protocol.<sup>2</sup> Obstructive sleep apnea was diagnosed according to the International Classification of Sleep Disorders (ICSD 2005). The study was approved by the ethics committee. Continuous positive airway pressure was considered initially accepted if the patient completed the titration trial in the SDC under PSG recording and described his/her sleep on CPAP as being good and was willing to use it at home. Those who refused the titration trial or continued but were still not satisfied with the machine were considered as not accepting it. Afterward, those who initially accepted to use the machine during split night study and bought it were followed up in the sleep clinic 3 months later. The number of patients who reported using CPAP at home for at least 4 hours/night for 5 or more nights per week was recorded. All CPAP machines were provided with heated humidifier.

**Table 1** - Polysomnographic variables and compliance with CPAP.

| Variables                     | Female<br>n=148 | Male<br>n=169 | P-value |
|-------------------------------|-----------------|---------------|---------|
| AHI                           | 56.5 ± 41.7     | 61.6 ± 34.9   | 0.005   |
| Desaturation index            | 36.8 ± 33       | 39.8 ± 30.9   | 0.20    |
| Time (min) saturation<br><90% | 30.7 ± 38.8     | 19.9 ± 29.67  | 0.13    |
| Lowest oxygen saturation      | 76.9 ± 15.18    | 80.24 ± 11.38 | 0.09    |
| Arousal index                 | 59 ± 36.6       | 60.6 ± 34.8   | 0.57    |
| Accept CPAP (%)               | 115 (77.7)      | 151 (89.3)    | 0.008   |
| Used CPAP (%)                 | 50 (33.7)       | 74 (43.7)     | 0.09    |

CPAP - continuous positive airway pressure,  
AHI - apnea hypopnea index

The mean age of the study group was 54.5±11.8 years for women and 43.5±12.5 years for men ( $p<0.001$ ). Their body mass index was 42.1±9.7 for women and 37.3±9.8 for men ( $P<0.001$ ). Epworth sleepiness scale (ESS) was 10.5 in both groups. The apnea hypopnea index (AHI) was 56.5±41.7/hour in women and 61.6 ± 34.9/hour in men ( $p=0.005$ ). There was no statistically significant difference in arousal index, desaturation index, lowest recorded saturation or time spent during sleep with saturation <90% between men and women (Table 1). Continuous positive airway pressure titration was initially accepted by 266 patients (83.9%) of the total study group. More men accepted the CPAP titration trial in the SDC than women ( $p=0.008$ ) (Table 1). At the end of follow up (3 months), 124 patients (39% of all patients who underwent split night study) reported using CPAP at least 4 hours/night for 5 or more nights per week with higher compliance among men compared to women, but the difference did not reach statistical significance (43.7% of men versus 33.7% of women,  $p=0.09$ ).

In the present report, the overall percentage of Saudi subjects who reported using CPAP at 3 months (39%) was lower than that reported by patients in other countries; 79% in Europeans, and 72% in Chinese.<sup>3,4</sup> Additionally, the present study demonstrates that initial CPAP acceptance during titration was significantly lower in women compared to men. Similarly, there was a trend of lower usage at 3 months among women compared to men. Female gender has been reported previously to be a predictor of poor CPAP compliance. Females were also more likely to refuse the initiation of CPAP therapy.<sup>5</sup> The lower compliance in women in our study could be related to their older age and their significantly lower AHI. However, social and cultural factors could

play an important role as well. Furthermore, larger local studies are needed to confirm the findings of this report and to explore the causes of lower usage and compliance to CPAP in Saudis in general and in Saudi women in particular.

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