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OCCURRENCE OF OBSTRUCTIVE SLEEP APNEA IN A GROUP OF SHIFT WORKED POLICE OFFICERS

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Shift work is an important source of health disturbances. Night work has a negative influence on some spheres: biological, working, social, and medical. Disturbances of sleeping, one group of manifestations of medical problems, can be considered as a cause of health deterioration. This study focuses on the occurrence of breathing disturbances during sleep in shift workers. Twenty one shift worked police officers (40-60 years old) were compared with an age-matched control group operating in the same environment. All subjects underwent overnight polysomnography. The polysomnographic investigation by shift workers was conducted after a day shift and normal night sleep, after an adaptational night in the sleep laboratory. Obstructive sleep apnea was found in 8 shift workers (38%) with AHI of 5.72-45.45 and in 8 control volunteers (38% of the studied group) with AHI of 5.00-25.24. All breathing parameters, as measured by polysomnography, did not differ between the two groups. Our results do not confirm the hypothesis that chronic irregular work hours promote the occurrence of obstructive sleep apnea in subjects aged 40-60 years.

Key words: apnea-hypopnea, breathing disturbances, shift work, sleep

INTRODUCTION

Industrial and cultural changes that occurred within industry in recent years, increased the perceived value of long work hours and flexibility from the side of employees. Such a situation has extended shift work operations in many industry sectors. The consequence of shift work and inadequate restorative sleep (sleep deprivation) is fatigue. Several studies of sleep-breathing physiology have shown that sleep deprivation may increase the severity of obstructive sleep apnea (OSA)

(1, 2, 3). The potential deleterious effect of sleep deprivation on breathing during sleep has been considered (4), but the issue is contentious. Studies have shown that sleep deprivation worsens OSA (5) or that "acute sleep deprivation did not worsen most OSA parameters as measured by polysomnography" (6).

The present study focused on the occurrence of breathing disturbances during sleep in shift workers who demonstrate a reduction in daily sleep associated with cumulative sleep deprivation.

MATERIAL AND METHODS

The study was approved by a local Ethics Committee. Informed consent was obtained from each subject of the study.

Twenty one fast-rotating shift worked police officers: 40-60 years old (mean age 47.1 ± 3.2 , BMI 28.1 ± 2.1 kg/m²) were involved in the study. An age-matched control group consisted of 21 subjects 35-60 years old (42.0 ± 2.8 , BMI 28.8 ± 2.3 kg/m²) who operated in the same environment. All subjects underwent overnight polysomnography (Alice3 Respironics; Murrysville, PA). The polysomnographic investigation by shift workers was conducted after a day shift and normal night sleep. The subjects of both study groups were investigated after an adaptational night in the sleep laboratory.

The subjects were regarded as having OSA if their apnea-hypopnea index (AHI) was ≥ 5 . Data are presented as means \pm SD. Wilcoxon's test was used for the statistical analysis (Statistica for Windows). A P value <0.05 was considered to indicate statistical significance.

RESULTS AND DISCUSSION

OSA was found in 8 shift workers (38% of the group studied) with the AHI of 5.00; 5.72; 6.94; 10.89; 12.22; 13.09; 31.12; 45.45. In the control group, OSA also was found in 8 volunteers (38%) with the AHI of 5.00; 5.36; 5.50; 8.06; 10.00; 14.23; 14.69; 25.24.

All breathing parameters, as measured by polysomnography, i.e., a total sleep time, a sleep period time, an arousal index, a number of central apneas, a length of the longest central and obstructive apnea, a time of snoring, and a minimum oxygen saturation secondary to apneic events did not differ in the both groups.

The occurrence of OSA in both groups involved in this study was relatively high. OSA affects approximately 25% of middle-aged men (7, 8, 9). The high prevalence of OSA in our study might be a consequence of overweight or obesity. Obesity, a strong correlate with OSA, has been hypothesized to affect breathing during alterations of upper airway structure and function and during "disturbance of the relation between respiratory drive and load compensation" (10). The data from that work indicate that a clinical program aiming at even a modest weight control is likely to be effective in reducing OSA (10).

In the present study, most OSA patients had mild disease. Only one obese control subject and two obese shift workers showed the AHI >15. These subjects did not report daytime sleepiness.

Our results did not confirm the hypothesis that chronic irregular work hours promote the occurrence of OSA in subjects aged 40-60 years. These data are in contrast to a study that has shown a marked increase in apnea events as the result of chronic partial sleep deprivation (11). On the other side, our data are in agreement with a study showing that acute sleep deprivation does not worsen OSA severity (6). Our shift workers were investigated after a day shift and normal night sleep. This situation may be different from that of a direct effect of the night work on the following night's sleep quality and characteristics. Larger studies are needed to explain the difference. Further studies also should examine differences with respect to the effects of shift work between subjects with and without OSA.

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