Sleep, ageing and night work

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Abstract

Studies have shown that the frequency or worsening of sleep disorders tends to increase with age and that the ability to perform circadian adjustments tends to decrease in individuals who work the night shift. This condition can cause consequences such as excessive sleepiness, which are often a factor in accidents that occur at work. The present study investigated the effects of age on the daytime and nighttime sleep patterns using polysomnography (PSG) of long-haul bus drivers working fixed night or day shifts. A total of 124 drivers, free of sleep disorders and grouped according to age (<45 years, N = 85, and ≥45 years, N = 39) and PSG timing (daytime (D) PSG, N = 60; nighttime (N) PSG, N = 64) participated in the study. We observed a significant effect of bedtime (D vs N) and found that the length of daytime sleep was shorter [D: <45 years (336.10 ± 73.75 min) vs N: <45 years (398 ± 78.79 min) and D: ≥45 years (346.57 ± 43.17 min) vs N: ≥45 years (386.44 ± 52.92 min); P ≤ 0.05]. Daytime sleep was less efficient compared to nighttime sleep [D: <45 years (78.86 ± 13.30%) vs N: <45 years (86.45 ± 9.77%) and D: ≥45 years (79.89 ± 9.45%) and N: ≥45 years (83.13 ± 9.13%); P ≤ 0.05]. An effect of age was observed for rapid eye movement sleep [D: <45 years (18.05 ± 6.12%) vs D: ≥45 years (15.48 ± 7.11%) and N: <45 years (23.88 ± 6.75%) vs N: ≥45 years (20.77 ± 5.64%); P ≤ 0.05], which was greater in younger drivers. These findings are inconsistent with the notion that older night workers are more adversely affected than younger night workers by the challenge of attempting to rest during the day.

Key words: Sleep; Shift work; Night work; Aging; Polysomnography; REM; Slow wave sleep (SWS)

Introduction

Shift work and nighttime work have increased significantly in modern society, changing the means of production and the organization of work in industries and drastically changing the lifestyle, health and well-being of workers. Over the last decades, many studies have focused on the general health and sleep of workers who have this type of work schedule. Continuous and prolonged shift work and nighttime work predispose workers to various diseases, such as cardiovascular and gastrointestinal disorders and psychosocial stress (1-4).

It has also been observed that these workers are routinely submitted to a chronic partial sleep deprivation due to the recurrent misalignment between sleep that takes place during the day and the external environment (5-9). A shorter and more fragmented sleep has well-known implications, such as excessive sleepiness, mental fatigue, irritability, and reduced performance, which are often the factors that cause many kinds of accidents at work (10-12).

Sleep disorders, such as periodic leg movements and sleep disorder-related breathing, are also prevalent among shift workers, and might increase the negative repercussions of sleeping during an inappropriate circadian phase (5). Indeed, some studies have demonstrated a direct relationship between sleep disturbance, sleepiness and accidents with motor vehicles. In a study with 2342 professional drivers, Howard et al. (13) observed a high frequency

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