



The effects of a 6 hours on/ 6 hours off maritime watch system on sleep

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Conclusion

The 6 h on/6 h off system resulted in a clear split sleep pattern, which may lead to higher sleepiness, with afternoon sleep being most negatively affected, presumably for both circadian and homeostatic reasons (prior amount of sleep), and with consequences for the total amount of sleep per 24h day that is lower than what may be necessary for optimal alertness.

Introduction

Fatigue at sea is involved in a number of maritime accidents and the work schedule (watch system) seems to be an important factor since it involves two periods of work and two periods of sleep per day. One important factor may be the amount and quality of sleep obtained in watch systems that displace sleep to the day and evening. Although several sea-watch systems are used, the 6h on/6 hours off system is becoming more frequent since only two officers are needed, alternating on the bridge. The present study aimed to investigate polysomnographical sleep on a 6h on/6 hours off schedule during a one-week maritime bridge simulator study of sleep and fatigue.

Results

Both teams showed relatively short 24h means for sleep. In both early and late into voyage conditions, Team A slept significantly less during morning sleep (179±9min) than during evening sleep (211±10min) and Team B slept more during night sleep (230±9min) than during afternoon sleep (127±10) (p<.01 for both). On the whole night and evening sleep was longer than morning or afternoon sleep. Team A had a significantly higher sleep efficiency in the condition late (88±3%) than during the early condition (78±2%) (p<.02), whereas Team B showed the opposite trend. For REM% Team A increased dramatically from 15±3% during the early condition to 28±4% during the late condition, while Team B showed a decrease from 21,5±3% in the early condition to 16,5±2% (p<.01). The total amount of sleep for the 24h period was significantly higher in the early condition (369,5 min) than in the late into voyage condition (329 min) (p<.01).

Methods

Twentyseven officers (Age 30-7), divided in two groups (Team A and Team B) worked a 6h on/6 hours off schedule during a week "at sea". Team A worked 00-06 and 12-18, with sleep between 06-12 (morning sleep) and 18-24 (evening sleep), team B worked 06-12 and 18-24, with sleep between 12-18 (afternoon sleep) and 00-06 (night sleep). All subjects were submitted to a 24 hour polysomnography recording (EEG, EOG and EMG) on the second and third day (early into voyage) and on the sixth and the seventh day (late into voyage).

