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Perspective

Exploring the Link between Night Shift Work and Circadian Change

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INTRODUCTION

Shift workers are more likely to have circadian disturbance and sleep deficiencies, which can lead to hypertension. We used ambulatory blood pressure monitors and thermometers to record the daily cycles of body temperature and Blood Pressure (BP) of 28 healthy healthcare professionals. The participants' work schedules included Rotating Shifts (RS, *i.e.*, RD/RN during day/ night shifts), regular Day shifts (D) and regular Night shifts (N). The quality and length of sleep were impacted differently by different shift schedules, which in turn changed the daily BP/ temperature rhythm waveform. The purpose of this study was to evaluate the circadian misalignment of blood pressure/temperature cycles in shift work environments. Eight hours of sleep the previous night and strong bimodal cyclic patterns in temperature, DBP and SBP were seen in D. N, a shift worker, showed split sleep, with extended work-hour naps in line with the everyday high and low blood pressure/temperature. In RS, the daily regularity of temperature and blood pressure was less pronounced. Overall, SBP caused more disturbance to the cardiovascular rhythm than DBP did. RS showed greater temperatures during the day-night cycle. While sleep bifurcation makes up for sleep deficiencies right away, it may also have long-term health effects due to changes in circadian waveforms of physiological cycles.

DESCRIPTION

More so than D and N, rotational shift work seems to reduce the amplitude of the body temperature rhythm. The amplitudes of D and N were 0.56°C and 0.67°C, respectively, indicating that N's consistent routines may allow for optimal adaptation by causing a shift in the circadian phase. Jang17 noted that the temperature amplitude decreased during the mid-night shift in RS, reaching its lowest point on the days that remained and increasing even more during the days with morning shifts after that. In the RN group, we also discovered the lowest amplitude (0.39°C). Regular shift rotation in RS interfered with the establishment of CR during the night shift.

In D, or those with consolidated sleep, a thermosregulated dip limits sleep preparation. However, in N and RN, the drop in temperature coincided with a nap taken during working hours. An increase in tolerance for working night shifts was shown by temperature and SBP dips during the work-hour nap, which supported synchronised temperature and CV rhythms. N was able to attain short-term sleep satisfaction thanks to fragmented sleep, despite it being less restorative than consolidated sleep. A favourable relationship between N's nap and self-reported sleep quality was discovered. The length of the nap did not affect sleep satisfaction. The current study has several disadvantages, such as a limited cohort size and manual body temperature measurement. Study follow-ups were challenging since RS left their jobs more frequently than D. Other significant elements that impact sleep and body temperature rhythm include diet and homeostatic drive.

CONCLUSION

While sleep bifurcation helps people recover from work-related sleep deprivation in the short term, it also raises the risk of long-term cardiovascular disease and may cause circadian pacemaker misalignment. Pathways that might potentially rectify both sleep bifurcation and circadian alignment in shift workers ought to be investigated. The potential exists that intermittent fasting combined with sleep bifurcation may assist correct circadian misalignment since feeding/fasting cycles have the capacity to append the sleep/wake cycle in the control of physiological and metabolic rhythms.

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