Does Resting for Two Consecutive Days Enable Complete Recovery From Night Work?

Mina Ha

The economic change, particularly the development of information and communication technology, has created the 24-h society where work can be done at any time, any place, and any shift, with night work becoming more common. Although the biological mechanism by which shift work increases the risk of cardiovascular disease has not been fully elucidated, there is evidence of a causal relationship between shift work and cardiovascular disease. Poor sleep and incomplete recovery from shift work can be a common pathway to cardiovascular disease; therefore, the scheduling of shift work to include a better distribution of free time may be a practical strategy to prevent the increased risk of cardiovascular disease that is associated with shift workers.

Lo et al. conducted a study involving nurses and found that the recovery of daytime blood pressure during the off-duty period following the night shift was incomplete, and that the daytime blood pressure on the off-duty day was as high as that observed on work days. Therefore, the authors suggested that employees receive two consecutive off-duty days following a night shift.

In their study, other possible confounding factors that could affect blood pressure or cardiovascular function, such as environmental work conditions, psychological and physical work load were controlled by restricting subjects who worked in the same occupational environment and did the same work. The individual characteristics and genetic effects were also controlled by self-control comparison of the blood pressure measured using an ambulatory blood pressure monitor (ABPM) for 48 h. Furthermore, restricting subjects to nurses who were unmarried and not caring for children may avoid the possible effect of the subjects’ extra burden at home, thereby allowing an accurate analysis of changes in daytime blood pressure following a night shift.

However, further evidence is required to justify implementing a scheduling policy of at least two consecutive rest days following a night shift to decrease the risk of cardiovascular disease.

For example, it is necessary to determine whether increased daytime blood pressure during off-duty days and increased blood pressure during sleep following the night shift lead to sustained high blood pressure, e.g., hypertension, as a long-term outcome of shift work. There is controversy regarding the association of shift work and hypertension due to the “selective survival” of shift workers with normal blood pressure bias that is common in studies with cross-sectional designs; therefore, more longitudinal follow-up studies are needed. In addition, the number of rest days required to recover completely from increased blood pressure following night shifts are still not known; therefore, it would be valuable to measure the ABPM for two or more consecutive off-duty days following a night shift.

Another interesting suggestion made by Lo et al. was that the dipper and nondipper status of shift workers changed. It has been known that subjects with high-nightly blood pressure or nondipper status have more hypertension-induced organ damage such as left-ventricular hypertrophy, microalbuminuria, and reduced arterial compliance. The findings of Lo et al’s study that the status of only a few workers changed from dipper to nondipper while that of more workers were found to shift from nondipper to dipper status through night shift contradict the suggestion that the night shift is harmful to blood pressure and induces a nondipping status. It is possible that these results occurred due to a limited number of subjects in the study. In addition, the dipping pattern during the sleeping period on off-duty days following night shift in the study conducted by Lo et al. should be interpreted carefully because the dipping status during off-duty days was primarily determined by the increased daytime blood pressure, and most likely did not occur as a result of elevation or drop in sleep time blood pressure.

Furthermore, as shown in Figure 2 of the study conducted by Lo et al., the range of blood pressure during the off-duty day following the night or evening shift is much wider than that of the off-duty day following the day shift. The very narrow range of blood pressure of the off-duty day following the day shift, e.g., almost the same with the baseline blood pressure level, implies that blood pressure of that day is completely recovered to the blood pressure of resting state. Therefore, a much wider blood pressure range during the off-duty day, which is similar pattern of the blood pressure variability during working day, might indicate the incomplete recovery of cardiovascular function. However, this cannot be clarified before taking additional blood pressure measurements using ABPM for two or more successive off-duty days following shift work.
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