

Night Shift Work as an Oxidative Stressor: A Systematic Review

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Abstract : Night shift workers make up an essential part of the modern workforce. However, night shift workers have higher incidences of late in life diseases and earlier mortality. Night shift workers are exposed to constant light and experience circadian rhythm disruption. Sleep disruption is thought to increase oxidative stress, defined as an imbalance of excess pro-oxidative factors and reactive oxygen species over anti-oxidative activity. Oxidative stress can damage cells, proteins and DNA and can eventually lead to varied chronic diseases such as cancer, diabetes, cardiovascular disease, Alzheimer's and dementia. This review aimed to understand whether night shift workers were at greater risk of oxidative stress and to contribute to a consensus on this relationship. Twelve studies published in 2001-2019 examining 2,081 workers were included in the review. Studies compared both the impact of working a single shift and in comparisons between those who regularly work night shifts and only day shifts. All studies had evidence to support this relationship across a range of oxidative stress indicators, including increased DNA damage, reduced DNA repair capacity, increased lipid peroxidation, higher levels of reactive oxygen species, and to a lesser extent, a reduction in antioxidant defense. This research supports the theory that melatonin and the sleep-wake cycle mediate the relationship between shift work and oxidative stress. It is concluded that night shift work increases the risk for oxidative stress and, therefore, future disease. Recommendations are made to promote the long-term health of shift workers considering these findings.

Keywords : night shift work, oxidative stress, circadian rhythm, melatonin, disease, circadian rhythm disruption

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