

Letter to the Editor

Light Exposure and Melatonin among Rotating Shift Nurses—Letter

Sylvia Rabstein, Thomas Behrens, and Thomas Brüning

We read with great interest the recent publication by Grundy and colleagues (1) on the influence of light at night exposures on melatonin levels among Canadian rotating shift nurses. This study contributes to the ongoing research in the field of possible mechanisms linking shift work effects with chronic diseases, especially breast cancer. The authors hypothesize that light exposure and history of long-term shift work influence melatonin levels. Light exposure measurements of a light data logger were concentrated by using the average light intensity from 12 midnight to 5:00 am. The authors did not find a strong association between light exposure and melatonin production. However, a long-term history of shift work was associated with an increase in peak melatonin levels.

In general, exposure assessment is a crucial issue in the analysis of epidemiologic studies, which is highly prone to error. Peak exposure may indicate the presence of an exposure threshold, whereas cumulative or average exposure measures often reflect a hypothesized time-dependent dose–response relationship (2).

In the analysis of a potential link between shift work, light-at-night, melatonin and health outcomes, "light pollution" can have many different aspects (3). As an interventional study showed, the study subjects' sensitivity to light at night was less after a week of bright light exposure during the day as compared with a week of dim light

exposure. Recent changes in light history, as well as night or daytime levels of peak light exposure, may therefore play a more important role in the synthesis of melatonin than average exposure to light at night (4). Here, on the one hand, periods of peak light at day or night could be relevant metrics. On the other hand, average light at night as a single exposure metric could be incapable to capture an acquired reduction in sensitivity to light, which may result in exposure misclassification and failure to detect a possible association between light exposure and melatonin synthesis.

Hence, it is important to analyze the data with respect to different exposure metrics, particularly when the underlying biologic mechanism is unknown (2). As the association between a reduction in nocturnal melatonin production and the risk of cancer may be driven by other exposure metrics, namely, levels of peak light exposures, considering different modeling strategies, may be a valuable approach in future epidemiologic studies of light pollution.

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

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