

Commentary

Avoiding room light during night may stimulate immunity in COVID-19 patients by promoting melatonin production

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ABSTRACT

COVID-19 is one of the greatest health issues facing humankind for many decades; it emerged in Wuhan, China, late in December 2019, and rapidly spread over the world within the short period. This report emphasizes the potential hazards of exposure to room light at night which affects the immunity of COVID-19 patients by suppressing their melatonin, which is only released from the pineal gland at night. Exposure to light at night is especially common in the hospital setting. This may make the symptom worse for the hospitalized patients and the light at night should not be ignored. Thus, I suggest that COVID-19 patients should avoid light at night either by wearing eye masks or darkening the room to enhance pineal melatonin synthesis and increase their serum melatonin levels.

Key words: COVID-19, melatonin, light-inhibition, immunity, eye masks, darkness.

COVID-19 infection is a serious condition which has led to the death of hundreds of thousands of people worldwide. While many drugs have been repurposed as potential treatments for this serious disease, none are efficacious to the point where they have become the “standard of care” (1, 2). Thus, there is an intensive search for molecules that will prevent or reduce the severity and mortality of this infectious disease which continues to ravage the population of many countries. One molecule that has been repeatedly suggested as a likely effective agent to treat COVID-19 is melatonin (3-8). Melatonin is a potent antioxidant and anti-inflammatory agent (9, 10), features which would likely make it useful in the treatment of COVID-19. A preliminary study of the use of melatonin as a treatment for this viral infection has proven its effectiveness reducing the severity of COVID-19 (11), limiting hospitalization and the necessity for intubation, which often leads to serious complications.

According to the World Health Organization (WHO), COVID-19 patients should be hospitalized for a period of two weeks; accordingly, they are often exposed to night lighting throughout the treatment period. It is known that people with a reduced immune response are more susceptible to COVID-19 infections compared to those with normal immunity. In the absence of a vaccine, stimulating the immune system of these patients may be an appropriate solution to reduce the recovery period or limit the severity of the disease. This narrative suggests

enhancement of patients' immunity during their stay in hospital by preserving their naturally endogenous melatonin secretion by blocking night illumination (12).

Melatonin (N-acetyl-5-methoxytryptamine) is a secretory product of the pineal gland which is primarily produced in a circadian pattern under the influence of the suprachiasmatic nucleus (SCN) located in the hypothalamus (13, 14). In mammals including humans, melatonin synthesis and secretion is stimulated during darkness and inhibited by light (15-17). Many studies have clearly documented the important role of melatonin and its positive effect on the immune system by enhancing circadian rhythms which, in turn, are linked to many central nervous system diseases, e.g., sleep disorders and seasonal affective disorder, etc. (18-21). In addition, numerous studies have confirmed that melatonin regulates the sleep wake cycle which is also important, in modulating the immune system responses as well as core body temperature, etc. (22-24). Melatonin regulates multiple aspects in immune responses by stimulating the production of lymphocytes, granulocytes, macrophages and NK cells (25, 26). Melatonin is a potent antioxidant which helps the immune system to fight invading viruses and an anti-inflammatory agent by subside inflammation (27-30). The comprehensive roles of melatonin in assisting humans to resist diseases is still under intense investigation.

Many studies have demonstrated that night time melatonin secretion is suppressed when light is detected by the retina (31, 32). The influence of light on the SCN/pineal/melatonin system has been extensively studied and well established, i.e., exposure to the artificial light at night causes disturbance of melatonin production (33-35). The production of melatonin by the pineal gland increases during the night and light after darkness onset is an acute melatonin suppressor (36-38). Melatonin synthetic suppression is especially sensitive to shorter wavelengths of light (blue) as opposed to longer wavelengths (39-42). Moreover, studies have also shown that melatonin suppression depends on the light intensity, i.e., the higher the light intensity, the lower the melatonin production is (43-46). Blood melatonin concentrations are highest during the mid-dark phase and being minimal levels during the light phase of the light/dark cycle (47-49). Consequently, protection from artificial light at night has become of interest to many researchers. Studies have shown that if night time illumination is shielded from the patients in the intensive care units (ICU) it preserves higher levels of circulating melatonin for these patients (50, 51).

In conclusion, melatonin plays an important role in the immune system and its production at night will be suppressed by light. The room light illumination at night will negatively affect COVID-19 patients by suppressing their melatonin production. The night time increased melatonin is important to enhance their immune system to improve their defense against viral infection, vis versa. Thus, this report suggests that COVID-19 patients should avoid exposure to room light at night either by wearing sleep eye masks or darkening the room to enhance the synthesis and release of pineal melatonin. This seems a minor measure, but it may have significant effects to improve COVID-19 patients' immune response against virus and reduce severity and mortality (52).

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CONFLICT OF INTEREST

No conflict of interest.

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