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INFLUENCE OF COVID-19 ON CIRCADIAN RHYTHMS

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In 2019, the world faced a pandemic of the coronavirus disease COVID-19 caused by severe acute respiratory syndrome 2 (SARS-CoV-2). Recent studies note the rising prevalence of anxiety and circadian rhythm disturbances during the COVID-19 pandemic. The goal is to update data on changes in circadian rhythms in people who have had COVID-19

English-language literary sources became the material of the study.

Biological rhythms are cyclic fluctuations in the intensity and nature of biological processes and phenomena. The circadian cycles are synchronized with the rotation of the Earth around its axis, are stable and persist throughout life. They form the basis of human physiological functions. The characteristic of each biorhythm can be depicted as a chronogram, which has a sinusoidal character. The most important source of information about the outside world for most organisms is the photochemical reactions of retinal cells. Therefore, periods of natural light are the main "time sensor" for circadian rhythms. The retina of the eye through the suprachiasmatic nucleus of the hypothalamus is connected with the superior cervical sympathetic ganglion, and then with the pineal gland (pineal gland). Pineal hormones (melatonin, serotonin) carry out photoperiodic control of daily and seasonal biorhythms. Melatonin is involved in the regulation of the induction of cortisol secretion by adrenocorticotrophic hormone, the production of mRNA 3- β -hydroxysteroid dehydrogenase, which regulates the synthesis of glucocorticoids.

The most common circadian rhythm disturbances were sleep phase shifts. It was revealed that a history of COVID-19 causes a greater predisposition of patients to the development of circadian rhythm disorders, in particular, to sleep phase disturbances and sleep delays. In addition, it has been found that patients after COVID-19 have increased levels of both personal and situational anxiety. An association has been shown between post-COVID-19 anxiety and circadian rhythm disturbances.

Studies in athletes have shown that poor sleep quality and severe insomnia during lockdown were most associated with late bedtime and prolonged sleep phase. Additionally, elite and older athletes were more vulnerable to these disruptions, compared to non-elite, team sports, and younger athletes, respectively. Female athletes reported lower sleep quality and higher insomnia compared to male athletes, regardless of self-isolation regimen. Quarantine has had a greater impact on the sleep and circadian rhythms of athletes compared to the general population.

In people who have had COVID-19, in addition to stress and anxiety, as well as personal characteristics such as increased anxiety, there may be other factors leading to sleep disorders. Changes in our daily routine, such as getting up at a certain time, eating, showing up for work, exercising, and engaging in social and leisure activities at relatively fixed times, are important timekeepers for keeping our sleep-wake cycles in sync with the day (light) and night (dark). Changes to these clocks, combined with reduced exposure to daylight, also needed to synchronize our biological clocks, can disrupt sleep and circadian rhythms. However, there are studies showing the short duration of such circadian rhythm disturbances.