

Chemotherapy for breast cancer is associated with disruption of sleep-wake rhythm in women

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A study in the Sept.1 issue of the journal *Sleep* shows that the sleep-wake activity rhythms of breast cancer patients are impaired during the administration of chemotherapy. Results indicate that the first cycle of chemotherapy is associated with a temporary disruption of these rhythms, while repeated administration of chemotherapy results in progressively worse and more enduring impairments.

During week one of the first cycle of chemotherapy, participants switched from low to high activity about 30 minutes later in the day and decreased their level of activity about 50 minutes earlier at night, suggesting that their days were shorter. During the first week of the fourth cycle of chemotherapy, the women increased their level of activity about 37 minutes later in the day and switched from high to low activity about 34 minutes earlier at night. Although most variables returned to baseline levels in the second and third weeks of the first cycle of chemotherapy, circadian impairments were maintained on several variables in the second and third weeks of cycle four.

Principal investigator, Sonia Ancoli-Israel, PhD, professor of [psychiatry](#) at the University of California San Diego, said that the findings were not surprising. Sleep disturbances are common in cancer patients, with 30 percent to 50 percent reporting symptoms of insomnia. Previous studies also have shown that both sleep and [fatigue](#) get worse with chemotherapy, so it was expected that [circadian rhythms](#) would

deteriorate.

"Results of this study suggest that our biological clocks are affected by chemotherapy. Our [biological clock](#), or circadian rhythm (24-hour cycles) help keep our bodies in sync with the Environment," said Ancoli-Israel. "During chemotherapy, our biological clock gets out of sync, especially after the first cycle of treatment. The clock seems to regulate itself after only one cycle, but with repeated administration of chemotherapy, it becomes more difficult for the biological clock to readjust."

The study involved 95 women with a mean age of 50.72 years who were scheduled to receive neoadjuvant or adjuvant anthracycline-based chemotherapy for stage I-III [breast cancer](#).

Participants wore a wrist actigraph for 72 consecutive hours at baseline (pre-chemotherapy), as well as during the first, second and third weeks of both cycle one and cycle four of chemotherapy. At each assessment they also completed a sleep log to record their bedtime, wake time and napping periods. Sleep-wake circadian activity variables were computed based on actigraphic data. Of the participants, 75 percent were Caucasian, 69 percent were married, 77 percent had at least some college education, and 73 percent reported an annual income of more than \$30,000.

Compared with baseline measures, all circadian rhythm variables except acrophase (the time of day of the peak of the curve) were significantly impaired during the first week of both the first and fourth chemotherapy cycles. These circadian rhythm variables included amplitude (height of the circadian rhythm), mesor (the mean of the rhythm), up-mesor (time of day when activity was switched from low to high), and down-mesor (time of day when activity switched from high to low).

According to the study, further research must be conducted in order to better understand the mechanisms through which chemotherapy may contribute to impairments in sleep-wake activity. Potential mechanisms include psychological factors (i.e. anxiety and depression) and behavioral factors (increased daytime napping), as well as physiological factors and physical symptoms, such as decreased levels of estrogen, impaired cortisol responses and inflammation.

The authors state that it is important to screen more routinely for sleep and circadian disruptions in breast cancer patients undergoing [chemotherapy](#) and to offer appropriate management, such as cognitive behavioral therapy or bright light therapy, in order to prevent sleep disturbances from becoming chronic.

Source: American Academy of Sleep Medicine ([news](#) : [web](#))

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