

Nightshift Work Associated With a Higher Risk of Ovarian Cancer

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Ovarian cancer can be difficult to diagnose early, and survival is poor. Greater body weight, higher parity (number of births), and use of hormonal contraceptives have been linked to increased risk, but in general the causes of ovarian cancer are not well understood. There is evidence that disruption of circadian rhythms (daily biological patterns) affects ovarian function, but few studies have investigated the relationship between nightshift work and the risk of ovarian cancer. The World Health Organization's International Agency for Research on Cancer classified shiftwork involving circadian disruption as a probable human carcinogen, though the mechanism of action of this is not clear. Melatonin, a hormone which is produced at night but suppressed by the presence of ambient light, may play a role in the relationship between shiftwork and cancer. Melatonin has been shown to influence reproductive hormones including estrogen, which could make it particularly relevant to ovarian cancer.

Drs. Parveen Bhatti, Mary Ann Rossing, and colleagues in PHS conducted a large population-based case-control study of the association between nightshift work and risk of epithelial ovarian cancer. Cases were identified from the western Washington Surveillance Epidemiology and End Results (SEER) registry and included 1,502 women ages 35-74 who had been diagnosed with a primary invasive (1,101) or borderline (389) epithelial ovarian cancer between 2002 and 2009. 1,849 controls of similar age were identified by random digit telephone dialing. Cases and controls were interviewed in person about the duration and timing of all jobs they had held between the age of 25 and the time of diagnosis (or until a comparable reference date, in the controls). The authors then calculated each subject's total amount of "nightshift work-years" (equivalent number of full-time years working nightshifts) during that period. They also collected information on "chronotype," or preference for activity in the morning vs. evening, and classified women as morning-type or evening-type.

The authors observed a higher risk of both invasive and borderline epithelial ovarian cancer associated with a history of any nightshift work (OR 1.24, 95% CI 1.04-1.49; and OR 1.48, 95% CI 1.15-1.90, respectively). However, among women with a history of working the nightshift, a higher cumulative duration of such work was not associated with greater risk, and study participants in the highest category for cumulative duration (>7 nightshift work-years) did not have an elevated risk of ovarian cancer. The higher risk associated with any history of nightshift work was limited to women

ages 50+, and to certain types of ovarian cancer (serous and mucinous histologies). Interestingly, the researchers also found suggestive evidence that, among nightshift workers, women who preferred evening rather than morning activity had a lower risk of ovarian cancer than those who did not. (Not surprisingly, they also found that women classified as "evening type" were more likely to have ever worked nightshifts than "morning type" women.)

Dr. Bhatti explained that future studies of this topic would assess chronotype as well as patterns of shiftwork in greater detail. "Our goal is to ... rigorously collect detailed employment histories that will allow us to pinpoint the specific aspects of shift work that are problematic, ...[and] measure biomarkers such as melatonin to gain a better understanding of the biological pathways that underlie the association between shift work and cancer." He also noted that a longer-term goal of this research is to identify potential targets for intervention, for the prevention of ovarian cancer. This research has broad relevance: "with 15-20% of salaried workers in the US engaged in shift work, any potential health effects associated with shift work are a major public health concern."

[Bhatti P, Cushing-Haugen KL, Wicklund KG, Doherty JA, Rossing MA](#). 2013. Nightshift work and risk of ovarian cancer. *Occup. Environ. Med.* 70:231–237.



Dr. Parveen Bhatti