Shift work, light at night and risk of breast cancer

A number of studies have hypothesized an association between breast cancer and disruption of circadian rhythms. In particular, it has been suggested that melatonin shows a potential oncostatic action, and exposure to artificial light during the night could suppress the normal nocturnal rise in melatonin. This in turn increases circulating oestrogen levels or inhibits tumour anti-proliferative mechanisms and possibly increases breast cancer risk [1–3].

The evidence to date is limited, but provides support for this hypothesis with several studies showing a positive association between overnight shift work and breast cancer and a tendency towards a negative association in blind women.

O’Leary et al. [4] evaluated the association between breast cancer and light-at-night exposures from both shift work and at home as a secondary aim of a study of electromagnetic fields and breast cancer in a group of women in Long Island (USA).

Study participants comprised 576 women diagnosed with primary in situ or invasive breast cancer between August 1996 and June 1997 and 585 population-based controls. All study participants were aged <75 years and had lived in the same home in Long Island for ≥15 years. Exposure to light at night through shift work (evaluated over the previous 15 years) and at home (over the previous 5 years) was obtained by using a staff-administered questionnaire, and odds ratios (OR) were calculated using unconditional multivariate logistic regression.

Shift work exposure history was categorized into (i) any shift work, (ii) any evening shift, (iii) evening shifts only, (iv) any overnight shift and (v) overnight shifts only. The referent group for these analyses included women who had never held jobs involving shift work.

Light-at-night exposure history at home was categorized into (i) turning on lights during sleep hours and (ii) non-peak sleep (habitually waking up on weekdays between 8.00 p.m. and 1.00 a.m. or habitually going to sleep on weekdays between 2.00 a.m. and 8.00 a.m.).

The study did not reveal an association between breast cancer and any shift work, or evening shift work, but revealed a negative association between any overnight shift work and breast cancer (adjusted OR = 0.55, 95% CI = 0.32–0.94).

However, women who frequently turned on lights at home during sleep hours (i.e. those who woke up and turned on lights twice a week or more often and twice a night or more often) had an increased breast cancer risk (adjusted OR = 1.65, 95% CI = 1.02–2.69).

Overall, the findings provide mixed evidence for the light-at-night hypothesis, with overnight shift work being associated with a decreased risk of breast cancer and high light-at-night exposure at home being associated with an increased risk. The authors conclude that further research is required to clarify these inconsistent findings.

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References