
RE: "NIGHT-SHIFT WORK AND BREAST CANCER RISK IN A COHORT OF CHINESE WOMEN"

The article by Pronk et al. (1) describing no association between night-shift work and breast cancer risk in a cohort of Chinese women makes a useful contribution to this

emerging and contested field of epidemiologic research. It is a large cohort and one of only a handful of prospective cohort studies that have investigated this association. It is

also the only study we are aware of conducted in a non-Caucasian population, and as such their results broaden the scope of previous research.

As the authors rightly point out, there may be a number of reasons for the conflicting results in this field of research including the inconsistent definition and measurement of shift work between studies and the limited knowledge of the specific aspects of shift work that may be carcinogenic. In addition, biologic differences between the populations studied may also be an explanation for the conflicting results. We suggest that there is evidence to indicate possible population variation in melatonin production that might be an explanation for the findings of Pronk et al.

A commonly proposed biologic mechanism for the relation between shift work and breast cancer is the melatonin (or light at night) hypothesis (2). Melatonin is primarily released at night (in response to the dark) and suppressed during the day by exposure to light. Light at night, such as that associated with working shift work, may interfere with melatonin secretion.

On the basis of this hypothesis, a number of small trials have been conducted to investigate melatonin suppression, 2 of which have results that may be relevant to the findings of Pronk et al. Kayumov et al. (3) conducted a small intervention study ($n = 11$) on the use of light-filtering goggles to prevent the suppression of melatonin by nocturnal lighting. They found that 9 of the 11 subjects had a reduction in melatonin production in response to bright unfiltered light (as predicted). The remaining 2 participants did not show any suppression in their nocturnal melatonin levels under either the bright unfiltered or the bright filtered light conditions, and both of these participants were of Chinese descent (3). Higuchi et al. (4) investigated the influence of eye color on melatonin suppression among Caucasians and Asians (this study was done in Japan, but the nationalities of the participants are not reported). The percentage of suppression of melatonin as a result of nocturnal light exposure was significantly smaller in the (dark-eyed) Asian compared with the (light-eyed) Caucasian participants.

Observational studies comparing melatonin secretion in Asian (Japanese) and Caucasian (American) populations have also found differences. Wetterberg et al. (5, 6) have published 2 studies comparing urinary melatonin in women in Japan and the United States. Both studies found significantly lower levels of melatonin excretion in the Japanese women compared with the American women (5, 6). In addition, Wetterberg et al. found a circannual (year long) rhythm in American women that was not present in the Japanese women (6).

Melatonin is not the only biologic mechanism proposed for the link between shift work and cancer. However, if variations in the timing and/or triggers of melatonin suppression are correlated with race, the results from Pronk et al. (1) may be consistent with this mechanism. We wonder whether Pronk et al. have collected data on melatonin levels and suggest that future studies of melatonin and/or shift work may want to consider ethnic background as a variable of interest.

ACKNOWLEDGMENTS

Conflict of interest: none declared.

REFERENCES

1. Pronk A, Ji BT, Shu XO, et al. Night-shift work and breast cancer risk in a cohort of Chinese women. *Am J Epidemiol*. 2010;171(9):953–959.
2. Stevens RG. Electric power use and breast cancer: a hypothesis. *Am J Epidemiol*. 1987;125(4):556–561.
3. Kayumov L, Lowe A, Rahman SA, et al. Prevention of melatonin suppression by nocturnal lighting: relevance to cancer. *Eur J Cancer Prev*. 2007;16(4):357–362.
4. Higuchi S, Motohashi Y, Ishibashi K, et al. Influence of eye colors of Caucasians and Asians on suppression of melatonin secretion by light. *Am J Physiol Regul Integr Comp Physiol*. 2007;292(6):R2352–R2356.
5. Wetterberg L, Halberg F, Tarquini B, et al. Circadian variation in urinary melatonin in clinically healthy women in Japan and the United States of America. *Experientia*. 1979;35(3):416–419.
6. Wetterberg L, Halberg F, Halberg E, et al. Circadian characteristics of urinary melatonin from clinically healthy young women at different civilization disease risks. *Acta Med Scand*. 1986;220(1):71–81.

Jennifer Girschik¹, Jane Heyworth², and Lin Fritschi¹
(e-mail: girschik@waimr.uwa.edu.au)

¹ Western Australian Institute for Medical Research, The University of Western Australia, QEII Medical Centre, Nedlands, Western Australia 6009, Australia

² School of Population Health, The University of Western Australia, Crawley, Western Australia 6009, Australia

DOI: 10.1093/aje/kwq275; Advance Access publication August 23, 2010