Cancer Epidemiology, Biomarkers & Prevention

Letter to the Editor

Light Exposure and Melatonin among Rotating Shift Nurses—Letter

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Grundy and colleagues (1) conducted a study into how light influences melatonin in nurses during rotating shifts. *Inter alia*, it was concluded that the examined "two-12-hour-days/two-12-hour-nights/5-days-off" pattern minimally disrupts melatonin production. Interestingly, chronotype information was obtained but appeared to have negligible effects on shift-work–melatonin relationships. The authors suggest that "future studies that include chronotype are needed to confirm our results." But beyond "testing" particular study results, chronotype should be considered as a general candidate variable (2) in shift-work and health and disease research.

With specific regard to melatonin, chronotype could nevertheless influence shift-work–light–melatonin relationships but this may be detectable only after more extreme shift schedules, including more consecutive shifts than the ones analyzed. Moreover, how chronotypes (assessed via the Horne–Ostberg questionnaire) were distributed may be(come) relevant in its own right. To systematically investigate biologically plausible roles of chronotypes, we must know their distribution in the general population to compare that with what we find in shift-workers. Hypothetically, we might expect selection effects in rotating shift-workers insofar as extreme chronotypes could be underrepresented. Indeed, "owls" or "larks" may do better during late day shifts and night shifts or early day shifts, respectively (3). But both extremes may suffer from shift-work rotating through all 24-hour time windows, disallowing to adjust their circadian rhythmicity like people who are neither evening nor morning types. Scattered information on the epidemiology of chronotypes could correspond with such notion as the Grundy population, at least with less than 20 years of shift-work, appears to include less "owls" and "larks" than could be expected in middle-aged working adults (4).

Overall, using chronotypes may offer sustainable advances for next-generation epidemiologic studies. According to Dyson (5), projects can become sustainable if their costs allow a sequence of similar investigations. To provide an example for shift-work research, focusing on information such as polymorphisms of clock genes in sizeable populations could certainly be interesting. But such approach would not be sustainable because costs will make this an unlikely strategy for routine projects. But well-designed studies—such as the investigation by Grundy and colleagues—which may help to answer how cost-efficient chronotype information may contribute insights into "when" individuals are really "exposed" to shift-work are promising starting points.

And why is the latter so important? Just consider the sobering possibility that in observational studies to date, the nonconsideration of chronotype information may have substantially biased, and possibly masked, cancer risks in shift-workers due to the very misclassification of "exposed" and "unexposed" individuals.

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

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