

Rotating night shift work linked to increased risk of Type 2 diabetes in women

6 December 2011

Women who work a rotating (irregular) schedule that includes three or more night shifts per month, in addition to day and evening working hours in that month, may have an increased risk of developing type 2 diabetes when compared with women who only worked days or evenings, according to a new study led by researchers at Harvard School of Public Health (HSPH). In addition, the researchers found that extended years of rotating night shift work was associated with weight gain, which may contribute to the increased risk of type 2 diabetes.

Previous studies have focused on the association between [shift work](#) and risk of cancer and [cardiovascular disease](#). The HSPH study is the largest study so far to look at the link between shift work and [type 2 diabetes](#) and the first large study to follow [women](#). The findings were published online December 6, 2011 in the open access journal [PLoS Medicine](#).

"Long-term rotating night shift work is an important risk factor for the development of type 2 diabetes and this risk increases with the numbers of years working rotating shifts," said An Pan, research fellow in HSPH's Department of Nutrition and the study's lead author.

The researchers, led by Pan and senior author Frank Hu, professor of nutrition and [epidemiology](#), analyzed data on more than 69,269 U.S. women, ages 42 to 67, in the Nurses' Health Study I, tracked from 1988 to 2008, and 107,915 women, ages 25 to 42, in the Nurses' Health Study II, tracked from 1989 to 2007. About 60% of the nurses performed more than one year of rotating night shift work at baseline; about 11% in Nurses' Health Study I had more than 10 years of rotating night shift work at baseline, and about 4% in Nurses' [Health Study II](#) worked more than 10 years of rotating [night shifts](#) at baseline, and this proportion increased during the follow-up.

The researchers found that the longer women worked rotating night shifts, the greater their risk of developing type 2 diabetes. Those women who worked rotating night shifts for three to nine years faced a 20% increased risk; women who worked nights for 10 to 19 years had a 40% rise in risk; and women who worked night shifts for over 20 years were 58% more at risk. In addition, women who worked rotating night shifts gained more weight and were more likely to become obese during the follow-up.

After taking into account body weight in the analyses, the increased risk of type 2 diabetes for women who worked rotating night shifts was reduced but remained statistically significant. For example, women who worked rotating night shifts for more than 20 years had 24% increased risk. These findings indicate that the relationship between night shift work and type 2 diabetes is partly explained by increased weight.

While the findings need to be confirmed in men and in some ethnic groups (96% of the participants were white Caucasians) and further studies are needed to identify underlying mechanisms for the association, the results are of potential public health significance due to the large number of workers who work rotating night shifts.

According to the U.S. Centers for Disease Control and Prevention (CDC), approximately 15 million Americans work full time on evening shifts, night shifts, rotating shifts, or other irregular schedules. Shift work has been shown to disrupt sleeping patterns and other body rhythms, and has been associated with obesity and metabolic syndrome, conditions associated with type 2 diabetes.

"This study raises the awareness of increased obesity and diabetes risk among night shift workers and underscores the importance of improving diet and lifestyle for primary prevention of type 2 diabetes in this high risk group," said Hu. Studies

also are needed to evaluate type 2 diabetes risk in other shift work schedules, such as evening shifts or permanent night shifts.

More information: "Rotating Night Shift Work and Risk of Type 2 Diabetes: Two Prospective Cohort Studies in Women," An Pan, Eva S. Schernhammer, Qi Sun, Frank B. Hu. *PLoS Medicine*, online December 6, 2011.
doi:10.1371/journal.pmed.1001141

Provided by Harvard School of Public Health

APA citation: Rotating night shift work linked to increased risk of Type 2 diabetes in women (2011, December 6) retrieved 5 May 2021 from <https://medicalxpress.com/news/2011-12-rotating-night-shift-linked-diabetes.html>

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