

Active and passive smoking linked to infertility and earlier menopause

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Active and passive smoking are linked to infertility problems and a hastening of the natural menopause before the age of 50, finds a large study published online in the journal *Tobacco Control*.

The highest levels of tobacco exposure were associated with the arrival of menopause 1 to 2 years earlier in active and [passive smokers](#) than

among lifetime non-smokers who had not been exposed to passive smoking, the findings show.

The researchers base their findings on information obtained on lifetime smoking habits, [fertility problems](#), and [age](#) at natural menopause provided by more than 93,000 [women](#) taking part in the Women's Health Initiative Observational Study (WHI OS).

All the women had gone through the menopause, and were aged between 50 and 79 when they were recruited to the study between 1993 and 1998, at 40 different centres across the USA.

Full data on tobacco exposure and fertility, including that of the partner, were available for 88,732 women. And 79,690 of the total sample of 93,676 had had a natural menopause, defined as not having had surgery to remove their ovaries and an absence of periods for 12 consecutive months.

Current and former smokers were asked how many cigarettes they had smoked daily, the age they had started smoking (below 15 to over 30), and how many years they had smoked.

Never smokers were asked if, and for how long, they had lived with a smoker as a child, as an adult, and if they had ever had a job where colleagues smoked in the workplace.

Some 15.4% of the women for whom fertility data were available (13,621 of 88,732), reported problems trying to conceive, defined as a period of 12 months or more. And almost half (45%; 35,834) the women included in the analysis looking at natural menopause said they had gone through their menopause before the age of 50.

Analysis of the data showed that [tobacco exposure](#) was associated with

an increased risk of infertility and earlier menopause.

Compared with never smokers, current or former smoking was associated with a 14% greater risk of infertility and a 26% heightened risk of menopause before the age of 50.

The average age at the start of the menopause was significantly earlier among smokers than it was among never smokers who hadn't been exposed to second hand smoke.

For the highest levels of tobacco use the menopause arrived almost 22 months earlier for those who said they had started smoking before their 15th birthday and 18 months earlier among those who smoked at least 25 cigarettes a day.

Among women who had never actively smoked, those who had been exposed to second hand smoke at the highest level of exposure—10 or more years of living with a smoker as a child, 20 or more years of living with a partner who smoked at home, and 10 or more years of working with colleagues who smoked—were 18% more likely to have had infertility problems than women who had never been exposed to passive smoking.

The highest level of passive smoke exposure was associated with the arrival of menopause 13 months earlier than the lowest (zero) level.

The findings held true after taking account of several influential factors, including body mass index (BMI) at the age of 18, educational attainment, alcohol consumption, exercise levels, insecticide exposure, oral contraceptive use, and age at first period.

The clinical significance of earlier menopause is not clear, say the researchers, but other studies have linked earlier [menopause](#) to a

heightened risk of death from any cause.

This is an observational study so no firm conclusions can be drawn about cause and effect, but their findings back those of other smaller studies, they say.

And there are plausible biological explanations for the results, they explain. The toxins found in tobacco smoke are known to have various deleterious effects on many aspects of reproduction and to disrupt hormone production and activity.

"This is one of the first studies of this size and statistical power to investigate and quantify active and passive smoking and women's health issues. It strengthens the current evidence that all women need to be protected from active and passive tobacco smoke," conclude the researchers.

More information: Andrew Hyland et al. Associations between lifetime tobacco exposure with infertility and age at natural menopause: the Women's Health Initiative Observational Study, *Tobacco Control* (2015). [DOI: 10.1136/tobaccocontrol-2015-052510](https://doi.org/10.1136/tobaccocontrol-2015-052510)

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