

# Infertility and pregnancy loss may increase women's risk of stroke later in life

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Infertility and pregnancy loss are associated with an increased risk of non-fatal and fatal stroke in later life, finds an analysis of observational

studies, published in *The BMJ*.

Early monitoring of women who have experienced [miscarriage](#) or stillbirth, along with healthy lifestyle changes, could lower the risk of stroke, the researchers suggest.

Globally, stroke is one of the leading causes of death and disability in women. In 2019 around 3 million women died from stroke. What's more, women lost a total of 10 million years of healthy life due to disability following a stroke— 44% more years than men did.

Known stroke risks such as obesity, high blood pressure hypertension, and diabetes do not fully explain women's higher risk of stroke. Previous studies on the link between infertility, miscarriage, and stillbirth with long-term stroke risk have been inconclusive.

To fill in the gaps, this study aimed to assess the link between infertility, miscarriage, and stillbirth with the risk of fatal and non-[fatal stroke](#), and specific type of stroke.

The researchers analyzed [data](#) from the InterLACE consortium, which pools data on [reproductive health](#) and chronic disease, from a total of 27 studies. Data from eight studies from seven countries (Australia, China, Japan, Netherlands, Sweden, UK, and the U.S.) were included in the analysis.

Questionnaires were used to find information on infertility, miscarriage, and stillbirth. Data for non-fatal stroke was also found using self-reported questionnaires, or hospital records. Hospital data were used to identify cases of fatal stroke, and subtypes of stroke (hemorrhagic or ischemic).

Overall, around 620,000 women were included in the study, aged from

32 to 73 at baseline.

Of these, 275,863 women had data on non-fatal and fatal stroke, 54,716 women only had data on non-fatal stroke, and 288,272 only had data on fatal stroke. Among these, 9,265 (2.8%) women experienced a first non-fatal stroke at a median age of 62, and 4,003 (0.7%) had a fatal stroke at a median age of 71.

Women with non-fatal stroke before the age of 40 were excluded, as they may have had a stroke before a history of infertility, pregnancy loss, or stillbirth could be established. Several factors that could have influenced the results were also taken into account, such as ethnicity, weight, lifestyle, and underlying conditions.

Infertility, miscarriage, and stillbirth were all associated with an increased risk of stroke, especially recurrent miscarriages (three or more) and stillbirths, the study finds.

Women with a history of infertility were at a 14% higher risk of non-fatal stroke than women without infertility.

Miscarriage was also associated with an 11% higher risk of non-fatal stroke compared to women who had not had a miscarriage. The risk increased with the number of miscarriages a woman had: one, two, and three miscarriages led to a 7%, 12%, and 35% increase in stroke risk, respectively.

For women who had three or more miscarriages, the increased risk of non-fatal ischaemic and hemorrhagic stroke was 37% and 41% respectively. Similarly, for fatal ischaemic and hemorrhagic stroke, three or more miscarriages were linked to an 83% and 84% risk increase respectively.

A history of stillbirth was associated with an over 30% higher risk of non-fatal stroke, and women who had multiple stillbirths (two or more) were almost 80% more likely to experience a non-fatal ischaemic stroke.

The study also found that recurrent stillbirth was associated with an over 40% higher risk of fatal stroke.

The researchers say that the link between infertility and increased stroke risk may be due to conditions such as [polycystic ovary syndrome](#) (PCOS) and premature ovarian insufficiency (POI), while [endothelial dysfunction](#) (narrowing of the heart's blood vessels) may explain the increased risk of stroke for women with a history of recurrent stillbirth or miscarriage.

But they also suggest that unhealthy lifestyles (such as smoking or obesity) are also associated with pregnancy loss, as well as infertility, which could also contribute to an elevated risk of stroke.

This is an observational study, and as such, can't establish a cause. The study has other limitations, for example, information was collected from questionnaires; the effects of other treatments were not explored due to limited data; and definitions of infertility, [stillbirth](#), and miscarriage may be different across the studies.

Nevertheless, this was a large, well-designed study and results were largely unchanged after further analyses, suggesting that the findings are robust.

According to the researchers, "having a history of recurrent pregnancy loss may be considered as a female-specific risk factor for stroke."

And they suggest early monitoring of [women](#) with a history of [pregnancy loss](#) or [infertility](#) while promoting healthy habits may help to lower their

risk of [stroke](#) later in life.

**More information:** Infertility, recurrent pregnancy loss, and risk of stroke: a pooled analysis of individual patient data of 618,851 women, *The BMJ* (2022). [DOI: 10.1136/bmj-2022-070603](https://doi.org/10.1136/bmj-2022-070603)

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