Study examines associations between contraceptive methods and early menopause

February 2 2022

Credit: Pixabay/CC0 Public Domain

The long-term use of oral contraceptives and certain methods of tubal ligation (TL) were associated with lower levels of a biomarker for ovarian aging, suggesting an increased risk for early menopause,

according to preliminary research by University of Massachusetts Amherst epidemiologists.

Using data from the landmark Nurses' Health Study II, among the largest investigations into the risk factors for chronic diseases in women, researchers at the UMass Amherst School of Public Health and Health Sciences examined the association of oral contraceptive use and tubal ligation with antimüllerian hormone (AMH).

The study's results, published in the journal *Menopause*, were "intriguing," according to lead author Christine Langton, who conducted the research as part of her Ph.D. dissertation.

"We're one of the larger studies to have looked at both of these contraceptive methods at the same time," says Langton, now a post-doctoral researcher at the National Institute of Environmental Health Sciences. "We feel we're contributing to the story, and to the literature, though nothing we did was definitive. This is a piece of the puzzle."

Women who experience menopause before the age of 45, defined as early menopause, are at greater risk for cardiovascular disease, osteoporosis and dementia, among other health conditions. Oral contraceptives change hormone levels and prevent ovulation; tubal ligation may affect blood supply to the ovaries, and certain methods of the procedure may damage the ovary and surrounding neural tissue, note the researchers, including senior author Elizabeth Bertone-Johnson, professor of epidemiology and Langton's mentor.

"Recently, AMH has become an established marker for the timing of menopause and was found to be strongly associated with the risk of early menopause," the paper states. "Yet, the association of reproductive and lifestyle factors with AMH levels remains unclear."

The team zeroed in on a subset of 1,420 premenopausal women in the Nurses' Health Study prospective cohort who had provided a blood sample between 1996 and 1999. A history of their oral contraceptive use and tubal ligation began in 1989 and was updated every two years until their blood was collected.

"Women who reported that their [tubal ligation] procedure included the use of a clip, ring or band had significantly lower AMH levels compared to women who never had a TL procedure," the researchers write.

One limit of this finding is the relatively small number of women reporting the type of tubal ligation, Langton adds.

When it came to oral contraceptives, "we saw a significant inverse association – the longer the use of oral contraceptives, the lower the AMH levels were," Langton says. "That particular finding was a little surprising to us because it didn't completely align with what we saw when we looked at oral contraceptives and early menopause in the larger cohort" of more than 115,000 women.

Even after adjusting for related factors including BMI, smoking, alcohol, number of pregnancies and breastfeeding, the inverse association between oral contraceptive use and AMH levels remained significant.

"We think further research is warranted," Langton says.

More information: Christine R. Langton et al, Association of oral contraceptives and tubal ligation with antimüllerian hormone, *Menopause* (2021). DOI: 10.1097/GME.0000000000001905

Provided by University of Massachusetts Amherst