

Oral contraceptives and hormone replacement therapy may protect women against brain aneurysms

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Results from a new study suggest that oral contraceptives and hormone replacement therapy (HRT) may yield additional benefit of protecting against the formation and rupture of brain aneurysms in women. The findings from this first-of-its-kind study by a neurointerventional expert from Rush University Medical Center were presented at the Society of Neurointerventional Surgery (SNIS) 7th annual meeting.

According to the lead author of the study, Dr. Michael Chen, neurointerventionalist at Rush, the retrospective, case-control study was initiated due to the observation that in the two largest [brain aneurysm](#) trials to date, cerebral aneurysms occurred most frequently in post-menopausal women.

The two trials, the International Subarachnoid Aneurysm trial and the International Study of Unruptured Intracranial Aneurysms, found that 70 percent of aneurysms occurred in post-menopausal women with the mean age of 52 at a time of life coinciding with a severe drop in estrogen levels.

"By understanding the potential link between low levels of estrogen and aneurysms, we can focus our areas of study with the hope of providing women who are at risk for brain aneurysms with preventative therapies," said Chen, who also is assistant professor of neurology, neurosurgery and radiology at Rush University.

Conducted over a two-year period from 2008-2010, researchers at Rush also studied a group of 60 women with both unruptured and ruptured aneurysms. Sixty-five percent of the cases were unruptured and 35 percent were cases where women had ruptured aneurysms. The ages of the women who participated in the study ranged from 31-80, and were under the care of Dr. Chen and his team.

By comparing a variety of factors in this case group to that of a control group including 4,682 random females, who represented national population averages, Chen and his team aimed to determine if a link existed between lower estrogen levels and aneurysm incidence. Both groups were screened with questions related to their gynecologic history and the use of estrogen modifying medications. Some of the variables included menstrual onset, the woman's age at the time of birth of her first child, use and duration of [oral contraceptives](#) and hormone replacement therapy, and age of the start of menopause.

In both groups, strong similarities existed across multiple screening factors. The median age of both groups was 53, and when comparing for pertinent criteria, the results were:

- Body Mass Index was 27.1 for case group and 25.2 for control group.
- Average age of menstrual onset was 13 years for both groups.
- The average age for those whose first pregnancy occurred over 30 years of age was 10 percent for the case group and 11 percent for the control group.

When it concerned use of estrogen modifying agents such as oral contraceptives and hormone replacement therapy, there were major

differences among the two groups. The rate of oral contraceptive usage in the case group was 60 percent compared to 77.6 percent for the control group.

Also, the rate of hormone replacement therapy usage was 23.7 percent for the case group and 44.8 percent for the control group. Also, when comparing the median duration of oral contraceptive use, results showed that the average duration was 2.6 years for the case group and 5.2 years for the control group.

"These differences in the usage of estrogen modifying agents qualify as statistically significant and indicate that women with brain aneurysms use oral contraceptives and [hormone replacement therapy](#) less frequently than the general population," said Chen. "It is reasonable to conclude that the data results support our hypothesis that drops in estrogen that occur in menstruation and particularly at menopause may explain why cerebral aneurysms are more frequently found in women, particularly at menopause."

For neurointerventional practitioners, this study provides another piece of evidence that estrogen stabilization may play a protective role in women who are at risk of aneurysms," said Chen.

Chen and his team at Rush plan on continuing their research efforts that will further examine the effects of estrogen on the blood vessels of the brain.

Provided by Rush University Medical Center

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