RSNA Press Release

Study Finds Key Brain Region Smaller in Birth Control Pill Users

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CHICAGO — Researchers studying the brain found that women taking oral contraceptives, commonly known as birth control pills, had significantly smaller hypothalamus volume, compared to women not taking the pill, according to a new study presented today at the annual meeting of the Radiological Society of North America (RSNA).

Michael L. Lipton, M.D., Ph.D., FACR

Located at the base of the brain above the pituitary gland, the hypothalamus produces hormones and helps regulate essential bodily functions including body temperature, mood, appetite, sex drive, sleep cycles and heart rate.

Structural effects of sex hormones, including oral contraceptive pills, on the human hypothalamus have never been reported, according to the researchers. This may be in part because validated methods to quantitatively analyze MRI exams of the hypothalamus have not been available.

"There is a lack of research on the effects of oral contraceptives on this small but essential part of the living human brain," said Michael L. Lipton, M.D., Ph.D., FACR, professor of radiology at the Gruss Magnetic Resonance Research Center at Albert Einstein College of Medicine and medical director of MRI Services at Montefiore Medical Center in New York City. "We validated methods for assessing the volume of the hypothalamus and confirm, for the first time, that current oral contraceptive pill usage is associated with smaller hypothalamus volume.

"At A Glance"

- The first study to examine the effects of oral contraceptives on the structure of the living human hypothalamus found that women taking birth control pills had significantly smaller hypothalamus volume.
- The hypothalamus helps regulate essential bodily functions including body temperature, mood, appetite, sex drive, sleep cycles and heart rate.
- Smaller hypothalamic volume was also associated with greater anger and showed a strong correlation with depression.

"Michael L. Lipton, M.D., Ph.D., FACR"
hypothalamic volume."

Oral contraceptives are among the most popular forms of birth control and are also used to
treat a host of conditions, including irregular menstruation, cramps, acne, endometriosis and
polycystic ovary syndrome. According to a 2018 report from the Centers for Disease
Control and Prevention's National Center for Health Statistics, from 2015 to 2017
approximately 47 million women aged 15–49 in the U.S. reported current use of
contraceptives. Of those, 12.6% used the pill.

In his study, Dr. Lipton and colleagues recruited a group of 50 healthy women, including 21
women who were taking oral contraceptives. All 50 women underwent brain MRI, and a
validated approach was used to measure hypothalamic volume.

"We found a dramatic difference in the size of the brain structures between women who
were taking oral contraceptives and those who were not," Dr. Lipton said. "This initial study
shows a strong association and should motivate further investigation into the effects of oral
contraceptives on brain structure and their potential impact on brain function."

Other findings from the study, which Dr. Lipton described as "preliminary," were that
smaller hypothalamic volume was also associated with greater anger and showed a strong
correlation with depressive symptoms. However, the study found no significant correlation
between hypothalamic volume and cognitive performance.

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Edasery, M.D., Shima Roknsharifi, M.D., and Chloe Ifrah, B.A. The study was funded by
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Editor's note: The data in these releases may differ from those in the published abstract and those actually
presented at the meeting, as researchers continue to update their data right up until the meeting. To ensure you
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For patient-friendly information on brain MRI, visit RadiologyInfo.org.