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New study shows caffeine consumption linked to estrogen changes

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Asian women who consumed an average of 200 milligrams or more of caffeine a day—the equivalent of roughly two cups of coffee—had elevated estrogen levels when compared to women who consumed less, according to a study of reproductive age women by researchers at the National Institutes of Health and other institutions.

However, white women who consumed 200 milligrams or more of caffeine a day had slightly lower estrogen levels than women who consumed less. Black women who consumed 200 milligrams or more of caffeine a day were found to have elevated estrogen levels, but this result was not statistically significant.

Total caffeine intake was calculated from any of the following sources: coffee, black tea, green tea, and caffeinated soda.

Findings differed slightly when the source of caffeine was considered singly. Consuming 200 milligrams or more of caffeine from coffee mirrored the findings for overall caffeine consumption, with Asians having elevated estrogen levels, whites having lower estrogen levels, and the results for blacks not statistically significant. However, consumption of more than one cup each day of caffeinated soda or green tea was associated with a higher estrogen level in Asians, whites, and blacks.

The changes in estrogen levels among the women who took part in the study did not appear to affect ovulation. Studies conducted in animals had suggested that caffeine might interfere with ovulation.

The study was published online in the *American Journal of Clinical Nutrition*.

"The results indicate that caffeine consumption among women of child-bearing age influences estrogen levels," said Enrique Schisterman, Ph.D., of the Division of Epidemiology, Statistics and Prevention Research at the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), the NIH institute where some of the research was conducted. "Short term, these variations in estrogen levels among different groups do not appear to have any pronounced effects. We know that variations in estrogen level are associated with such disorders as endometriosis, osteoporosis, and endometrial, breast, and ovarian cancers. Because long term caffeine consumption has the potential to influence estrogen levels over a long period of time, it makes sense to take caffeine consumption into account when designing studies to understand these disorders."

The study authors noted that 89 percent of U.S. women from 18-34 years of age consume the caffeine equivalent of 1.5 to two cups of coffee a day.

The study's first author was Karen C. Schliep, Ph. D., M.S.P.H., from the University of Utah, Salt Lake City, who conducted the study during a research appointment at NICHD. Dr. Schliep undertook the research with Dr. Schisterman and colleagues at the University of Utah, the NICHD and the State University of New York at Buffalo.

More than 250 women from 18 to 44 years old participated in the study between 2005 and 2007. On average, they consumed 90 milligrams of caffeine a day, approximately equivalent to one cup of caffeinated coffee.

Most of the participants in the study reported to the study clinic one to

three times a week for two menstrual cycles. Their visits were scheduled to correspond with specific stages of the menstrual cycle. At the visits, the women reported what they had eaten in the last 24 hours and answered questions about their exercise, sleep, smoking and other aspects of their lifestyle and reproductive hormone levels were measured in blood. The study authors noted that collection of these details during multiple time points across two menstrual cycles produced more precise information about the link between caffeine and hormones than was possible in earlier studies. The researchers also noted that the study participants were more racially diverse than those who took part in previous studies.

Provided by National Institutes of Health

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