Couples' pre-pregnancy caffeine consumption linked to miscarriage risk

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A woman is more likely to miscarry if she and her partner drink more than two caffeinated beverages a day during the weeks leading up to conception, according to a new study from researchers at the National Institutes of Health and Ohio State University, Columbus. Similarly, women who drank more than two daily caffeinated beverages during the first seven weeks of pregnancy were also more likely to miscarry.

However, women who took a daily multivitamin before conception and through early pregnancy were less likely to miscarry than women who did not. The study was published online in *Fertility and Sterility*.

"Our findings provide useful information for couples who are planning a

pregnancy and who would like to minimize their risk for early pregnancy loss," said the study's first author, Germaine Buck Louis, Ph.D., director of the Division of Intramural Population Health Research at NIH's Eunice Kennedy Shriver National Institute of Child Health and Human Development.

The researchers analyzed data from the Longitudinal Investigation of Fertility and the Environment (LIFE) Study, which was established to examine the relationship between fertility, lifestyle and exposure to environmental chemicals. The LIFE Study enrolled 501 couples from four counties in Michigan and 12 counties in Texas, from 2005 to 2009.

For the current study, researchers compared such lifestyle factors as cigarette use, caffeinated beverage consumption and multivitamin use among 344 couples with a singleton pregnancy from the weeks before they conceived through the seventh week of pregnancy.

The researchers reported their results using a statistical concept known as a hazard ratio, which estimates the chances of a particular health outcome occurring during the study time frame. For example, the researchers evaluated caffeinated beverage consumption in terms of the daily likelihood of pregnancy loss over a given time period. A score greater than 1 indicates an increased risk for pregnancy loss each day following conception, and a score less than 1 indicates a reduced daily risk.

Of the 344 pregnancies, 98 ended in miscarriage, or 28 percent. For the preconception period, miscarriage was associated with female age of 35 or above, for a hazard ratio of 1.96 (nearly twice the miscarriage risk of younger women). The study was not designed to conclusively prove cause and effect. The study authors cited possible explanations for the higher risk, including advanced age of sperm and egg in older couples or cumulative exposure to substances in the environment, which could be

expected to increase as people age.

Both male and female consumption of more than two caffeinated beverages a day also was associated with an increased hazard ratio: 1.74 for females and 1.73 for males. Earlier studies, the authors noted, have documented increased pregnancy loss associated with caffeine consumption in early pregnancy. However, those studies could not rule out whether caffeine consumption contributed to pregnancy loss or was a sign of an unhealthy pregnancy. It's possible, the authors wrote, that these earlier findings could have been the result of a healthy pregnancy, rather than caffeine consumption interfering with pregnancy. For example, the increase in food aversions and vomiting associated with a healthy pregnancy led the women to give up caffeinated beverages.

Because their study found caffeine consumption before pregnancy was associated with a higher risk of miscarriage, it's more likely that caffeinated beverage consumption during this time directly contributes to pregnancy loss.

"Our findings also indicate that the male partner matters, too," Dr. Buck Louis said. "Male preconception consumption of caffeinated beverages was just as strongly associated with pregnancy loss as females'."

Finally, the researchers saw a reduction in miscarriage risk for women who took a daily multivitamin. During the preconception period, researchers found a hazard ratio of 0.45— a 55-percent reduction in risk for pregnancy loss. Women who continued to take the vitamins through early pregnancy had a hazard ratio of 0.21, or a risk reduction of 79 percent. The authors cited other studies that found that vitamin B6 and folic acid—included in preconception and pregnancy vitamin formulations—can reduce miscarriage risk. Folic acid supplements are recommended for women of childbearing age, as their use in the weeks leading up to and following conception reduces the risk for having a

child with a neural tube defect.

The U.S. Centers for Disease Control and Prevention offer information on the steps men and women of reproductive age can take to help ensure they have a healthy baby—whether they are planning pregnancy or not.

More information: Germaine M. Buck Louis et al. Lifestyle and pregnancy loss in a contemporary cohort of women recruited before conception: The LIFE Study, *Fertility and Sterility* (2016). DOI: 10.1016/j.fertnstert.2016.03.009

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