Short and long sleep in early pregnancy linked to high blood pressure in the third trimester

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A study in the Oct. 1 issue of the journal *Sleep* found that getting too little or too much sleep in early pregnancy is associated with elevated blood pressure in the third trimester. The study suggests that improving prenatal sleep hygiene may provide important health benefits.

Results show that the mean systolic blood pressure in the third trimester was 114 mm Hg in women with a normal self-reported nightly sleep duration of nine hours in early pregnancy, 118.05 mm Hg in women who reported sleeping six hours or less per night, and 118.90 mm Hg in women with a nightly sleep duration of 10 hours or more in early pregnancy. After adjustments for potential confounders such as age, race and pre-pregnancy body mass index, mean systolic blood pressure was 3.72 mm Hg higher in short sleepers and 4.21 mm Hg higher in long sleepers. Similar results also were found for diastolic blood pressure.

"Both short and long sleep duration in early pregnancy were associated with increased mean third trimester systolic and diastolic blood pressure values," said principal investigator and lead author Dr. Michelle A. Williams, professor of epidemiology in the School of Public Health at the University of Washington and co-director of the Center for Perinatal Studies at Swedish Medical Center in Seattle, Wash.

The study also found an association between sleep duration and preeclampsia, a condition that involves pregnancy-induced hypertension

along with excess protein in the urine. The risk of developing preeclampsia was almost 10 times higher (adjusted odds ratio = 9.52) in very short sleepers who had a nightly sleep duration of less than five hours during early pregnancy. Overall, about 6.3 percent of participants were diagnosed with either preeclampsia or pregnancy-induced hypertension without proteinuria.

"If our results are confirmed by other studies, the findings may motivate increased efforts aimed at exploring lifestyle approaches, particularly improved sleep habits, to lower preeclampsia risk," said Williams.

According to the National Heart, Lung, and Blood Institute, systolic blood pressure - the top number in a blood pressure reading - is the force of blood in the arteries as the heart beats. A systolic blood pressure reading is considered to be "high" if it is 140 or more millimeters of mercury.

The Eunice Kennedy Shriver National Institute of Child Health and Human Development reports that preeclampsia is a syndrome that occurs after the 20th week of pregnancy. It should be monitored closely by a medical professional because it can have a severe impact on the health of the mother and her baby.

The study involved 1,272 healthy, pregnant women who completed a structured interview at 14 weeks gestation, on average. Sleep duration in early pregnancy was evaluated by the question, "Since becoming pregnant, how many hours per night do you sleep?" Only about 20.5 percent of women reported a sleep duration of nine hours per night, which was used as the "normal" reference category because prior research indicates that pregnant women tend to have longer sleep duration patterns. About 55.2 percent of women reported sleeping seven to eight hours per night, 13.7 percent slept six hours or less and about 10.6 percent slept 10 hours or more.

After delivery, data on maternal blood pressures at routine prenatal care visits were abstracted from participants' medical records, providing an average of 12 blood pressure values for each participant. Women with pre-gestational chronic hypertension were excluded from the study. Mean systolic blood pressures were 111.8 mm Hg and 111.4 mm Hg in the first and second trimesters, and 114.1 mm Hg in the third trimester.

According to the authors, a number of mechanisms by which habitual short sleep duration may lead to increased blood pressure have been proposed. Because blood pressure is known to dip by an average of 10 to 20 percent during sleep, short sleep durations may raise the average 24-hour blood pressure and heart rate. This may lead to structural changes that gradually raise the pressure equilibrium of the entire cardiovascular system. Sleep restriction also may produce abnormalities in the levels of hormones such as endothelin and vasopressin, which play an important role in the cardiovascular system. The authors suspect that the association between long sleep duration and elevated blood pressures may be related to unmeasured confounders such as obstructive sleep apnea, depression or insulin resistance.

Williams noted that this study is the first step at filling an important gap in the scientific literature. Because most sleep studies exclude pregnant women, little is known about how insufficient sleep during gestation contributes to increased risks of medical complications of pregnancy.

"Moving forward, large-scale sleep studies should include pregnancy cohorts so that health care providers and mothers-to-be can more fully appreciate the health risks of insufficient sleep," she said.

Williams advises pregnant women and women who are planning to become pregnant to develop healthy habits that promote sufficient sleep. The tips she suggested include:

- Establishing a consistent sleep schedule
- Following a relaxing bedtime routine
- Creating a comfortable sleep environment
- Keeping technological distractions such as the TV and computer out of the bedroom
- Eating at least two to three hours before bedtime
- Exercising regularly during the day
- Avoiding caffeine and alcohol before bedtime and giving up smoking

More information: More information about sleep and pregnancy is available from the American Academy of Sleep Medicine at www.sleepeducation.com/Topic.aspx?id=40

Provided by American Academy of Sleep Medicine

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