Exercise benefits found for pregnancies with high blood pressure

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Contrary to popular thought, regular exercise before and during pregnancy could have beneficial effects for women that develop high blood pressure during gestation, human physiology professor Jeff Gilbert said, summarizing a new study by his research team that appears in the December issue of *Hypertension*, a journal of the American Heart Association.

Gilbert's team observed that placental ischemia-induced hypertension in rats was alleviated by exercise and was accompanied by a restoration of several circulating factors that have recently been shown to be important in causing the high blood pressure associated with preeclampsia.

Hypertensive disorders of pregnancy, such as preeclampsia, are the most common dangerous pregnancy complications, occurring in 5 percent to 8 percent of pregnancies. Globally, preeclampsia and other hypertensive disorders of pregnancy cause 76,000 maternal and 500,000 infant deaths each year, conservatively, according to the Preeclampsia Foundation.

"The data from our study raise the possibility that exercise regimens if started before pregnancy and maintained through most of gestation may be an important way for women to mitigate the risk of preeclampsia," Gilbert said. "There are certainly questions that remain, such as when and how much exercise is required and whether exercise training must begin before pregnancy for these beneficial effects to occur. Moreover, further studies are needed to determine if it can safely be used as a therapeutic modality for hypertension caused by insufficient blood flow

in the placenta.

"But these results are certainly encouraging," he added.

Previous clinical and epidemiological studies have long suggested that regular exercise before and during pregnancy reduced risk of preeclampsia but definitive mechanistic studies on the topic had been lacking until recently. Even though these findings are exciting, there are still safety concerns that need to be evaluated clinically and exercise continues to be discouraged in pregnancies complicated by high blood pressure.

Working in accordance with National Institutes of Health guidelines for animal use, Gilbert's team induced hypertension in pregnant rats by restricting blood flow to the rat placentas and monitored gestation after six weeks of exercise on activity wheels. Animals in test and control groups ran approximately 30 kilometers per week before pregnancy and approximately 4.5 kilometers per week during pregnancy.

Wheel running before and during pregnancy reduced high blood pressure. It also improved circulating concentrations of vascular endothelial growth factor and restored the balance between that factor and soluble fms-like tyrosine kinase 1, which restricts blood vessel growth and function. The study suggests that exercise lowers high blood pressure by maintaining the balance of these two factors that promote proper blood vessel growth and function.

Exercise also improved endothelial cell function and reduced oxidative stress in the hypertensive rat. Fetal weight was not compromised by exercise and there were no obvious signs of fetal stress in rats with hypertension that exercised, Gilbert said.

Provided by University of Oregon