

Changing hormones and nerve activity during menstrual cycle predispose women to knee injuries, researchers find

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(Medical Xpress)—Hormone changes during a woman's menstrual cycle and the resulting fluctuations in nerve activity may be a major reason female athletes have more knee injuries than their male counterparts, according to a new study from The University of Texas at Austin's College of Education.

The research was done by Matthew Tenan, Yi-Ling Peng and Dr. Lisa Griffin, all of The University of Texas at Austin, and Dr. Anthony Hackney of the University of North Carolina – Chapel Hill.

"Research has established that females have more knee injuries, particularly [anterior cruciate ligament](#) (ACL) tears, and more chronic frontal knee pain than males, and research also has shown that biomechanical differences between the sexes may contribute to this," said Griffin, an associate professor in the Department of Kinesiology and Health Education and director of the Spinal Cord Injury and Neuromuscular Physiology Laboratory. "This is the first study, though, ever to examine the role that nerve motor firing times could play in the injuries."

According to Tenan, who is a doctoral student in the Department of Kinesiology and Health Education, this research could lead to specific preventive solutions for women's [knee injuries](#).

"Previous research indicated that the predisposition to knee injury in women could be an inevitable result of nonmodifiable biomechanical factors like hip width," said Tenan. "Our research suggests that the predisposition to knee injury in women is preventable if women focus on doing exercises that strengthen the thigh and hip muscles. These exercises may minimize the [muscle activation](#) discrepancies across the [menstrual cycle](#), and this is the line of research we're continuing to pursue."

He anticipates it could be especially helpful for women who participate in sports such as cross country and soccer, which require significant amounts of running.

For the study the research team asked seven female study participants between 19 and 35 years of age to take their body temperature every morning over the course of their menstrual cycle.

In addition to tracking body temperature, study participants also were asked to visit the research facility five times during their menstrual cycle to have tiny, hair-thin wire electrodes inserted into two muscles around one knee. The electrodes measured the motor unit activity in those muscles as the women did knee extensions.

"Charting of the fluctuating body temperature and measurement of changing motor unit activity showed that motor unit firing patterns are significantly different over the course of the menstrual cycle," said Tenan. "Probably the most notable finding was that the rate of firing rises in the late luteal phase, and the fluctuations in motor unit activity over the menstrual cycle could be a predisposing factor for the increased rate of [knee](#) pain in women. The finding is important because once we know the cause of the [knee pain](#), strategies can be developed to decrease the occurrence."

The study findings were presented in October at the national annual Integrative Biology of Exercise meeting in Colorado. The meeting was organized by the American Physiological Society, the American College of Sports Medicine and the Canadian Society for Exercise Physiology.

Provided by University of Texas at Austin

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