

Red flag for repetitive stress injuries identified for first time in humans

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For the first time in humans, scientists have found early indicators of inflammation — potential warning signs — in work-related injuries caused by repetitive motion.

Their findings could someday lead to early detection and prevention of debilitating conditions such as carpal tunnel syndrome and tendonitis.

The new study from Temple University senior researchers Ann Barr and Mary Barbe and their doctoral student, Stephen Carp, in the March issue of *Clinical Science*, found that the immune system pumps out biomarkers (different kinds of chemicals) as the body begins to become injured by repetitive motions. These biomarkers warn of an underlying problem.

"While not a diagnostic test, because the biomarkers could also indicate another type of injury, they do provide a red flag where before there was none," said Barr, associate professor of physical therapy at Temple's College of Health Professions.

Currently, healthcare providers can diagnose repetitive motion injuries (RMI) based only on physical examination findings and the symptoms reported by the patient.

Typically, RMI sufferers don't experience symptoms of pain until the damage has begun. So the researchers' main goal has been finding a means to detect the problem before the damage starts. That way, conservative intervention — ibuprofen, rest breaks at work, exercise —

can be evaluated as to their effectiveness in preventing the development of chronic work-related conditions and, consequently, the need for more serious measures such as surgery.

"If the injury to the tissues can be halted, then hopefully long-term damage and impairment can be avoided," said Barbe, also an associate professor of physical therapy.

Employers and workers know the dramatic impact of RMIs, which cause pain, loss of function and close to a third of missed workdays in the United States, at a cost of \$20 billion a year in workers' compensation.

In previous studies, the researchers pinpointed these early warning signals in a rat model of RMI. The current study is the first to identify the warning signals in humans.

For the study, they recruited 22 participants who were suffering from repetitive-stress injuries, including carpal tunnel syndrome, tendonitis, and other wrist and shoulder injuries, and nine healthy subjects. After a physical examination that rated the severity of symptoms ranging from pain to range of motion, participants were given blood tests for evidence of biomarkers.

"The blood tests revealed significant levels of several types of inflammatory mediators — biomarkers — which signaled an underlying problem," said Barr. "Also, the more severe the injury, the more biomarkers there were."

Future research by the team will look deeper into the potential of biomarkers as indicators of injury and recovery.

Source: Temple University

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