Genetic study defies 'one-size-fits-all' approach to prescribing opioids for chronic pain

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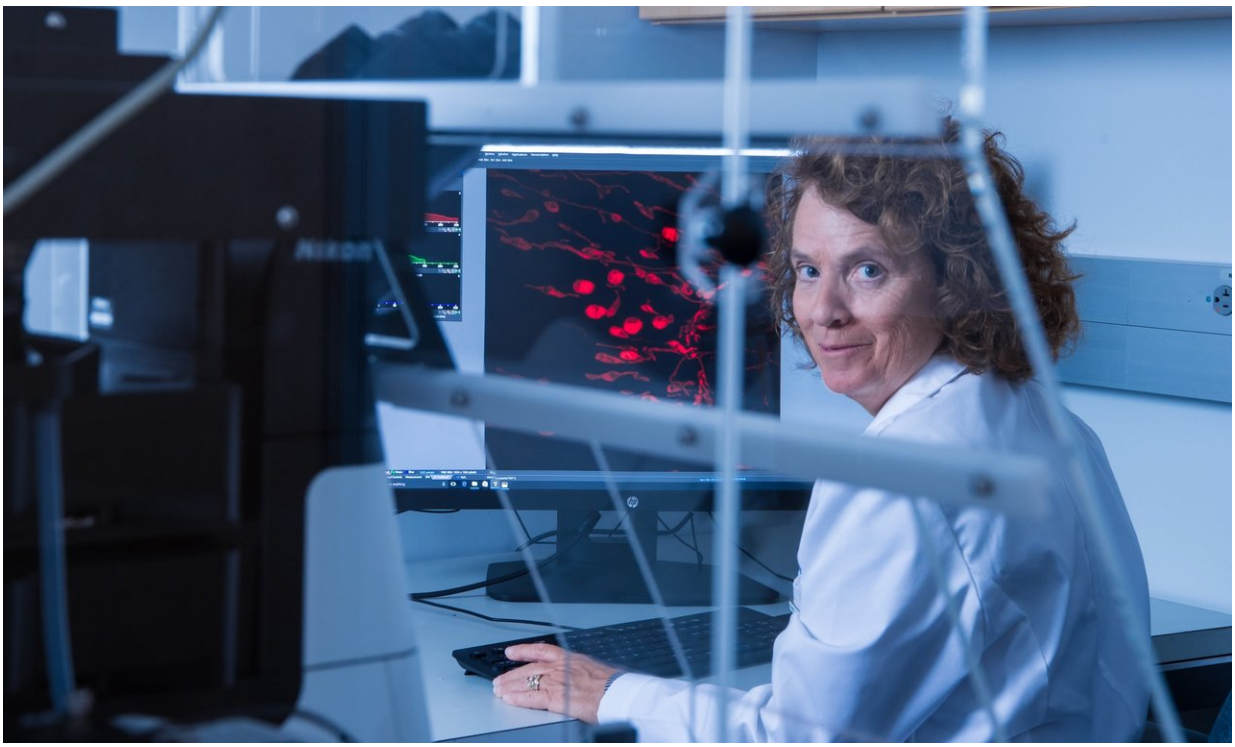

Janet Robishaw, Ph.D., professor and chair within the Department of Biomedical Science in FAU's Charles E. Schmidt College of Medicine. Credit: Florida Atlantic University

It impacts 100 million Americans, it is the number one reason that people go to see the doctor, and it is now a national crisis. The problem:

chronic pain and prescription opioids. The dilemma: how to provide the most effective pain treatment for 80 percent of pain patients who are at least risk for addiction while causing the least harm to the remaining 20 percent who are at most risk. The solution: it's very complicated, but it may be possible to address both problems without adversely affecting either.

Opioids (morphine, Oxycontin, Viocodin), which can lead to increased risk of addiction, have been the mainstay of treatment for moderate to severe pain for decades. The challenge is that their effects on patients vary tremendously. Prescription opioid-use disorder affects about 2 million Americans each year and is the number one cause of accidental death. Right now, attempts to prevent opioid use disorder focus mainly on reining in prescription practices, which is problematic.

A researcher from Florida Atlantic University's Charles E. Schmidt College of Medicine has received a five-year, $4 million grant from the National Institutes of Health to help solve the "one-size-fits-all" approach to prescribing opioids for chronic pain. Because of the high heritability, finding the genetic predictors of prescription opioid use disorder is more critical than ever. Currently, little data exists on clinical characteristics and genetic variants that confer risk for opioid use disorder.

In a novel study, Janet Robishaw, Ph.D., professor and chair within the Department of Biomedical Science in FAU's College of Medicine, and colleagues from Geisinger Health System and the University of Pennsylvania, are assessing clinical and genetic characteristics of a large patient cohort suffering from chronic musculoskeletal pain and receiving prescription opioids. As part of the DiscovEHR project, they have leveraged data from Geisinger's central biorepository and electronic health record (EHR) database to conduct large-scale genomics research and phenotype development.

With this information, this multidisciplinary team will derive a clinical and genetic profile of prescription opioid-use disorder and use this knowledge to develop an "addiction risk score." Findings from this study will be key for identifying those who are at low-risk for opioid use disorder from those who are at high-risk and who need additional counseling and access to other treatment options.

"The overall goal of this project is figuring out if there is a unique genetic signature of patients who are most susceptible to addiction," said Robishaw. "In the first part of our study, we are looking at the clinical characteristics of these patients to understand the cause of their pain and how prescription opioids are affecting their outcomes."

As part of this initial process, the investigative team composed of Robishaw, Wade H. Berrettini, M.D., Ph.D., Karl E. Rickels professor of psychiatry at the University of Pennsylvania, and Vanessa Troiani, Ph.D., assistant professor at Geisinger, are administering questionnaires that will give them additional information on the patients' pain phenotype as well as whether or not they're showing symptomology of prescription opioid-use disorder. It will take them about two years to analyze the data to divide the patient population into cases and controls in order to complete a genome-wide association study, which is the second part of the research project.

The genome-wide association study will help the researchers determine if there is a particular subset of genes and genetic variants that are influencing susceptibility to becoming addicted to prescription opioids. Once they are able to generate the hypothesis that a genetic variant is responsible for increasing risk, the next steps for research will involve functional studies on those top associations to prove causation.

"There is an urgent need to develop clinical, genetic and neural characteristics of patients who are at moderate- to high-risk of becoming

addicted to prescription opioids," said Phillip Boiselle, M.D., dean of FAU's College of Medicine. "The National Institutes of Health grant awarded to Dr. Robishaw and her collaborators will help them to identify the genetic factors that increase the risk of addiction in patients, which then become targets for new drug development."

The investigative team stresses the importance of using a multipronged approach to addressing this national crisis, which should involve research, education and engaging patients so that they understand their susceptibility to risks and empower them in their health care decisions.

"Prescription opioid-use disorder is a lifelong problem that requires a thoughtful approach that is not going to be solved just by curtailing prescriptions of these narcotics," said Robishaw. "We have to employ more rigorous prescribing practices and provide alternative treatments for moderate to severe pain that don't involve opioids. And, we need to improve access to medication-assisted therapy for those patients already dependent on prescription opioids. Currently, only 7 percent of patients with prescription opioid-use disorder have access to such treatments and this is because of a variety of reasons like costs and availability of these services."

Provided by Florida Atlantic University