Medical Xpress

Genetics can predict and help improve how patients fare after bariatric surgery, concludes research

September 28 2023, by Ellen Goldbaum

Credit: Unsplash/CC0 Public Domain

Clinicians treating severe obesity have a new genetic tool for predicting—and ultimately improving—bariatric surgery outcomes.

That's the conclusion of two new papers by translational scientists at the University at Buffalo and their colleagues. Published in the *Journal of Personalized Medicine* and *Biomedicines*, the papers describe findings that indicate that a genetic test used to predict an individual's risk level for various addictions also has significant value in determining how bariatric surgery patients will fare after the procedure.

The findings were produced by an ongoing, longitudinal study led by UB researchers on how best to optimize outcomes after bariatric surgery.

The results are important in light of soaring obesity rates worldwide, which have resulted, not surprisingly, in an increased incidence of bariatric surgeries. Worldwide, more than half a million people have the procedure each year.

While surgery is remarkably successful in treating most patients with severe obesity, a minority of patients regain the weight and may have negative outcomes.

Increased risk for other addictive behaviors

"There is a percentage of patients who have a negative outcome after bariatric surgery," says Panayotis K. Thanos, Ph.D., corresponding author on the papers, senior research scientist in the Department of Pharmacology and Toxicology and the Clinical and Research Institute on Addictions in the Jacobs School of Medicine and Biomedical Sciences at UB.

In some instances, patients may develop new addictive behaviors that may or may not involve alcohol or substance use.

"Some patients regain weight, and some develop addictions that they didn't have before, such as alcohol abuse or smoking," says Thanos,

adding that knowing ahead of time who is at risk for negative outcomes would be extremely helpful to clinicians and patients.

Team science approach

The idea originated at a brainstorming session in 2019 organized by Teresa Quattrin, UB Distinguished Professor in the Department of Pediatrics and an endocrinologist with UBMD Pediatrics, who is also co-corresponding author on both papers.

The session was comprised of UB researchers who study obesity from different disciplines. They decided to take a team science approach to the question, leveraging the expertise of a neuropharmacologist (Thanos) and endocrinologists, as well as bariatric surgeons.

"We wanted to find out, can we learn about genetic and psychosocial factors that will help predict outcomes after bariatric surgery?" says Thanos. "What predicts who will do well and who will not do so well?"

To find out, a total of 34 bariatric surgery patients at Kaleida Health's Comprehensive Weight Loss and Bariatric Surgery Center at Buffalo General Medical Center were enrolled and underwent genetic and psychosocial testing both before and after surgery.

The Genetic Addiction Risk Severity (GARS) test invented by co-author Kenneth Blum measures important gene variants linked to the net release of the molecule dopamine, which plays an important role in the brain's reward signaling as well as other key brain molecules. The paper published in *Biomedicines* found that 76% of 34 patients in the study who had undergone bariatric surgery had a genetic risk for addictive behaviors as measured by the GARS test.

In addition, the findings also suggest that those with a specific genetic

variant known as the DRD2 polymorphism were actually more responsive to weight loss treatment.

Thanos says this finding agrees with earlier studies showing significantly better compliance in dopaminergic agonist therapy and days completed in treatment compared to non-carriers of the DRD2 A1 variant.

The researchers found that some data from psychological questionnaire screening was also helpful and associated with both body mass index and body weight six months after surgery.

"The way I'd describe it is that certain genetic variants predict greater compliance following surgery and may help us understand which patients will do better and which might need additional adjunct therapies," Thanos explains.

Quattrin adds, "These important longitudinal data can help patients undergoing bariatric surgery reduce potential future addictive behavioral transfer, such as alcohol abuse or gambling."

Perfect fit for precision medicine

The findings demonstrate that precision medicine has a key role to play in optimizing bariatric surgery outcomes.

"You hear a lot about precision medicine," Thanos says, "but how do you translate that to the patient? With this study, precision medicine ties in very well. We obtain psychosocial and genetic information from individual patients and then use it as a precision approach to optimizing outcomes.

"The idea is that as we collect more data, we will be able to provide more information for clinicians so they can say, 'OK, here are some

things that predict success or that we may need to customize in order to overcome some obstacle.'"

Future studies will track the same data in patients farther out from their surgeries with close monitoring of the development of any new addictive behaviors.

More information: Panayotis K. Thanos et al, The First Exploratory Personalized Medicine Approach to Improve Bariatric Surgery Outcomes Utilizing Psychosocial and Genetic Risk Assessments: Encouraging Clinical Research, *Journal of Personalized Medicine* (2023). DOI: 10.3390/jpm13071164

Panayotis K. Thanos et al, Genetic Correlates as a Predictor of Bariatric Surgery Outcomes after 1 Year, *Biomedicines* (2023). DOI: 10.3390/biomedicines11102644

Provided by University at Buffalo