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STUDY REVEALS NEW GENETIC FACTORS LINKED TO KIDNEY STONES

Genetic variants linked to metabolic and crystallization pathways may increase risk.

Highlights

- A large genome-wide association study has identified 14 variants—including 9 new variants—at different locations in the genome that are linked to the development of kidney stones.
- Four of the variants were related to obesity, high triglycerides, or high blood uric acid levels. The remaining 10 variants were associated with kidney- or electrolyte-related traits that might affect crystallization pathways that lead to kidney stone formation.

Washington, DC (April 11, 2019) — Researchers have discovered new genetic factors that likely contribute to the development of kidney stones. The findings, which appear in an upcoming issue of the *Journal of the American Society of Nephrology (JASN)*, may be useful for predicting individuals' risk of developing kidney stones and for identifying new targets for prevention and treatment.

Increasing numbers of adults are developing kidney stones, a condition called urolithiasis, and they often experience considerable pain and frequent recurrences. To date, 6 genetic variants have been linked to urolithiasis, and the role of these variants are not well understood.

To provide new insights into the condition and its potential genetic causes, a team led by Koichi Matsuda, MD, PhD and Chizu Tanikawa, PhD (The University of Tokyo) performed a large-scale analysis of the entire genomes of 11,130 Japanese patients with urolithiasis and 187,639 controls, followed by a replication analysis of 2,289 affected patients and 3,817 controls.

The analysis revealed 14 variants at different locations in the genome that were linked to urolithiasis, including 9 new variants. Four of the variants were related to obesity, high triglycerides, or high blood uric acid levels. The remaining 10 variants were associated

with kidney- or electrolyte-related traits that might affect crystallization pathways that lead to kidney stone formation.

“To the best of our knowledge, this study included the largest number of urolithiasis cases,” Dr. Matsuda. “Because urolithiasis is a preventable disease—by changing lifestyle factors such as hydration, weight control, and food intake—the study’s results are useful for risk prediction and disease prevention,” said Dr. Matsuda.

Study co-authors include Yoichiro Kamatani, M.D., Ph.D., Chikashi Terao, M.D., Ph.D., Masayuki Usami, M.D., Ph.D., Atsushi Takahashi, Ph.D., Yukihide Momozawa, Ph.D., Kichiya Suzuki, M.D., Ph.D., Soichi Ogishima, M.D., Ph.D., Atsushi Shimizu, M.D., Ph.D., Mamoru Satoh, M.D., Ph.D., Keitaro Matsuo, M.D., Ph.D., Haruo Mikami, M.D., Ph.D., Mariko Naito, M.D., Ph.D., Kenji Wakai, M.D., Ph.D., Taiki Yamaji, M.D., Ph.D., Norie Sawada, M.D., Ph.D., Motoki Iwasaki, M.D., Ph.D., Shoichiro Tsugane, M.D., Ph.D., Kenjiro Kohri, M.D., Ph.D., Takahiro Yasui, M.D., Ph.D., Yoshinori Murakami, M.D., Ph.D., and Michiaki Kubo, M.D., Ph.D.

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The article, entitled “Novel Risk Loci Identified in a Genome-Wide Association Study of Urolithiasis in a Japanese Population,” will appear online at <http://jasn.asnjournals.org/> on April 11, 2019, doi: 10.1681/ASN.2018090942.

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of Nephrology, may be useful for predicting individuals' risk of developing kidney stones and for identifying new targets for prevention and treatment.