



# PRESS RELEASE

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## CERTAIN ENVIRONMENTAL CHEMICALS LINKED WITH POOR KIDNEY HEALTH

*Study uncovers known and previously unknown toxins that may contribute to kidney disease*

### Highlight

- In an analysis of blood and urine samples from 46,748 US adults, elevated levels of 7 environmental chemicals were associated with markers of kidney disease.

**Washington, DC (May 21, 2020)** — Researchers have found links between various chemicals in the environment and a higher risk of kidney disease. The findings appear in an upcoming issue of *CJASN*.

Exposure to certain chemicals may contribute to the development of chronic kidney disease (CKD), but the growing number of chemicals being introduced into the environment has made it difficult to understand the extent of the problem and to decipher which compounds are especially toxic to kidney health.

To investigate, Jeonghwan Lee, MD, PhD (Seoul National University Boramae Medical Center) and his colleagues tested hundreds of chemicals for potential links to CKD, through what is known as an environmental-wide association study. “Recently, people have been exposed to more environmental chemicals than before. Of these chemicals, only a few are known for their effects on diseases such as CKD,” said Dr. Lee. “Moreover, the impact of newly introduced chemicals is not known at all.”

The researchers analyzed information on 46,748 US adults who participated in the National Health and Nutrition Examination Survey from 1999 to 2016, and they looked for associations between 262 chemicals measured in urine or blood with signs of kidney disease—specifically, albuminuria (excess urinary excretion of the protein albumin) and low estimated glomerular filtration rate (eGFR), a measure of kidney function.

Among the 262 environmental chemicals, 7 (3%) showed significant associations with higher risk of albuminuria, lower eGFR, or a composite of both albuminuria and lower eGFR. These chemicals included metals and other chemicals that have not previously been associated with CKD.

Specific findings include:

- High blood and urine levels of cotinine (found in tobacco) and high blood levels of 2,5-dimethylfuran (a volatile organic compound) and cadmium (a heavy metal) were associated with albuminuria.
- High blood levels of lead and cadmium were associated with lower eGFR.
- High blood levels of cadmium and lead and 3 volatile compounds (blood 2,5-dimethylfuran, blood furan, and urinary phenylglyoxylic acid) were associated with the composite of both albuminuria and lower eGFR.
- A total of 23 chemicals—including serum perfluorooctanoic acid, 7 urinary metals, 3 urinary arsenics, urinary nitrate and thiocyanate, 3 urinary polycyclic aromatic hydrocarbons, and 7 volatile organic compounds—were associated with lower risks of one or more manifestations of CKD.

Additional studies that investigate the mechanisms by which these different chemicals in the environment can affect the kidneys are warranted. An accompanying editorial by James Kaufman, MD (New York University School of Medicine and VA New York Harbor Healthcare System) notes that this is a daunting task. “Meanwhile, we need to make sure that workers have appropriate protective equipment when exposed to toxic chemicals and that we all have access to clean, safe water,” he wrote.

Study co-authors include Sohee Oh, PhD Habyeong Kang, MS, Sunmi Kim, PhD MS, Gowoon Lee MS, Lilin Li, MS, Clara Tammy Kim, PhD, Jung Nam An, MD, PhD, Yun Kyu Oh, MD, PhD, Chun Soo Lim, MD, PhD, Dong Ki Kim, MD, PhD, Yon Su Kim, MD, PhD, Kyungho Choi, PhD, and Jung Pyo Lee MD, PhD.

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The article, entitled “Environment-wide Association Study of CKD,” will appear online at <http://cjasn.asnjournals.org/> on May 21, 2020, doi: 10.2215/CJN.06780619.

The editorial, entitled “Environmental Risks to Kidney Health,” will appear online at <http://cjasn.asnjournals.org/> on May 21, 2020, doi: 10.2215/CJN.05290420.

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