Even small reductions in kidney function may damage heart, blood vessels

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Even small reductions in kidney function are associated with heart and blood vessel damage, according to new research in the American Heart Association's journal *Hypertension*.

"Even in very healthy people, a small reduction in kidney function from normal to just a bit below normal was associated with an increase in the mass of the left ventricle, a change that makes the heart stiffer and impairs its ability to contract," said Jonathan Townend, M.D., senior author of the paper and professor of cardiology at the Queen Elizabeth Hospital Birmingham in Edgbaston, United Kingdom.

For years, it has been known that people with long-standing kidney disease are at increased risk of heart disease.

"Mild chronic kidney disease is common, affecting over 10 percent of the U.S. population, so if kidney disease really is a cause of heart disease it may be a major public health problem," Townend said. However, since kidney disease patients commonly have other risk factors, such as high blood pressure and diabetes, the direct effect of diminishing kidney function on the heart has been uncertain.

To look for a direct link, the researchers tracked an extremely healthy group of people - living kidney donors - to see whether the decreases in kidney function that occur after donation were associated with heart and blood vessel changes.

Researchers compared 68 kidney donors (average age 47) with 56 controls (average age 44) through the first year after surgery. Compared with controls, the researchers found that kidney donors had:

- An expected decline in kidney function (as measured by the glomerular filtration rate and the appearance of the protein albumin in the urine).
- An increase in the mass of the left ventricle, a strong predictor of heart disease risk.
- An increase in measures of heart damage apparent in blood tests, such as troponin.
- No difference in blood pressure.

"This is evidence that reduction in kidney function itself leads directly to measurable adverse effects on the heart and blood vessels, even without other risk factors. More research is needed to know just what aspects of reduced kidney function are responsible for the effects," Townend said.

As for kidney donors, the researchers urge them not to worry about the new findings.

"Kidney donors are already highly selected as healthy individuals. Our paper has shown that kidney donation causes very small adverse effects on the heart and blood vessels that took careful and accurate measurements to detect. We do not yet know if these effects are maintained over the long term. Even if there is a small increase in your long-term risk of heart disease after donation, it is still likely that you will be at lower than average risk, Townend said.

Researchers suggest that all people discuss heart disease risk, and ways to lower it, with their physicians if medical tests indicate reduced kidney function.

More information: Cardiovascular Effects of Unilateral Nephrectomy in Living Kidney Donors, *Hypertension*. 2016; 67:368-377. DOI: 10.1161/HYPERTENSIONAHA.115.06608

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