

Different antibiotics' effects on gut microbes may impact hypertensive organ damage

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New research in rodents indicates that altering gut microbes may affect the development of organ damage associated with hypertension. The findings will be presented at [ASN Kidney Week 2023](#), November 1–5.

For the study, scientists used narrow-spectrum antibiotics to specifically deplete Gram-negative or Gram-positive bacteria in rats with hypertension. Hypertension-related kidney damage and [cardiac hypertrophy](#) were lessened by vancomycin treatment (which targets Gram-positive bacteria). Polymyxin B treatment (which targets Gram-negative bacteria) showed no significant effect. Blood pressure levels for both antibiotic treatments were not significantly different from no antibiotic treatment.

Surprisingly, vancomycin treatment led to a massive increase of Lactobacilli, which are considered "good" Gram-positive bacteria. When the researchers examined [immune cells](#) isolated from the hypertensive rats' hearts, kidneys, blood, spleen, and intestines, they observed many pro-inflammatory immune cell types. Vancomycin treatment reduced inflammation in the kidney. Polymyxin B treatment did not alter any inflammatory states.

"Our study shows that modifying the gut microbiota, in this case by oral administration of nonabsorbable antibiotics in a rat model, can ameliorate hypertensive kidney damage and inflammation, independent of blood pressure," said corresponding author Moritz Immanuel Wimmer of Charité-Universitätsmedizin Berlin. "In the future, we would like to achieve such effects without antibiotics. We also aim to further understand and harness the underlying mechanisms for the kidney protective effects we observed."

More information: Study: Targeted Antibiotic Modulation of the Gut Microbiome Ameliorates Hypertensive Organ Damage

Provided by American Society of Nephrology

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