Study finds less extensive damage in young female mice from chemotherapy-induced kidney injury

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Young females may have the greatest level of protection against acute kidney injury (AKI) caused by the chemotherapy drug Cisplatin, commonly used to treat lung, ovarian, bladder and stomach cancer. Nearly a third of all people who are treated with Cisplatin develop AKI. The study—the first to investigate combined sex and age differences in the response to kidney injury—is published ahead of print in the *American Journal of Physiology—Renal Physiology* and was chosen as an APSselect article for September.

Previous research has found that higher expression of an enzyme that breaks down iron in the blood protects both sexes from kidney injury by aiding a function called autophagy. Autophagy is a self-digestion process that removes damaged cells and promotes the creation of new cells that help repair the kidneys' duct system. However, autophagic activity naturally slows during the aging process, which may prevent the kidneys from repairing themselves effectively.

Researchers from the University of Alabama at Birmingham, and the Veterans Affairs Medical Center studied four groups of Cisplatin-exposed mice: Young females, old females, young males and old males. The young male and young female groups both had high amounts of a protein that acts as a marker for autophagy when compared with the old groups. The young males measured somewhat higher protein levels than the young females. Overall, however, the young female group had less

kidney damage and inflammation than the old female group and both male groups. This finding suggests that "young females may utilize autophagy more efficiently than other sex/age groups to repair the tubular damage leading to a more robust response to AKI and preservation of renal function," the research team wrote.

More information: Ravindra Boddu et al. Unique sex- and age-dependent effects in protective pathways in acute kidney injury, *American Journal of Physiology - Renal Physiology* (2017). DOI: 10.1152/ajprenal.00049.2017

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