The decision to initiate dialysis for acute kidney injury (AKI) varies depending on different patient factors and there is a lack of robust evidence as to which patients are likely to benefit most and why. A new study from researchers at the Perelman School of Medicine at the University of Pennsylvania has shown that for patients with lower creatinine concentration levels – a sign of reduced muscle mass and weakness – initiation of dialysis could actually be detrimental. The findings are published online first in the *Clinical Journal of the American Society of Nephrology*.

Acute kidney injury is a complication often seen in critically ill patients and is marked by a sudden, temporary and sometimes fatal loss of kidney function. Approximately 10 percent of critically ill patients in a hospital setting will suffer from AKI. The decision to initiate dialysis for AKI is impacted by multiple factors, is difficult for physicians and families, and is costly to society.

"Many clinicians feel that, although acute dialysis may not help a critically ill patient, it is unlikely to cause any harm. Through this study, we have been able to show for the first time among an equally matched group of patients that dialysis for AKI may cause more harm than good in the subgroup of people who are frail and have lower muscle mass, and more benefit than harm in more robust patients," said lead study author F. Perry Wilson MD, MSCE, an instructor of Medicine in the Renal, Electrolyte and Hypertension Division at Penn. "This finding is analogous to chemotherapy for cancer – if you are strong enough to cope..."
with the adverse effects, it's good for you, but if you're weak it may kill you."

Considering the high mortality rate for patients with AKI who receive acute dialysis (approximately 50 to 80 percent) and the increasing prevalence of this condition related to an aging U.S. population and increasing need for hospitalization, further defining the best treatments and patients likely to benefit from interventions such as dialysis is critical.

For the current study, the research team analyzed data for adult patients admitted to one of three acute care hospitals within the University of Pennsylvania Health System over a six-year period who subsequently developed severe AKI, among whom 602 received dialysis. Of these patients who initiated dialysis, 545 were matched to 545 patients who had not initiated dialysis on the same day of AKI.

Wilson and colleagues found that dialysis was associated with increased survival when initiated in AKI patients with more elevated creatinine, but was associated with increased mortality when initiated in patients with lower creatinine concentrations. For example, among patients who were matched with a creatinine less than 2.8mg/dl, 64 percent of those who did not receive dialysis died during the hospitalization, compared to 78 percent who did receive dialysis. Among those who were matched with a creatinine greater than 4.2 mg/dl, 57 percent of those who did not receive dialysis died compared to 47 percent of those who did receive dialysis.

Additionally, the researchers also discovered that male sex and black race were negatively associated with initiation of dialysis, as was the presence of a do-not-resuscitate order. The study also confirmed prior research by Dr. Wilson that showed Sunday (versus other days of the week) was also negatively associated with initiation of dialysis.
"Our findings suggest that there is continuing need for further randomized trials to determine which patients benefit from dialysis for AKI and which are in fact harmed by this therapy," said Dr. Wilson. To this end, Wilson and colleagues at Penn are involved in additional research examining factors that will aid clinicians in determining which patients are most likely to benefit from acute dialysis initiation.

Provided by University of Pennsylvania School of Medicine


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