

A Comparison of Early Versus Delayed Initiation of Renal Replacement Therapy in Critically Ill Patients

Zain Ul Abideen¹

¹Department of Internal Medicine, Shifa International Hospital, Islamabad, Pakistan

THE STUDY: Guadry S, Hajage D et al. Initiation strategies for renal replacement therapy in the intensive care unit. *N Engl J Med.* 2016 14:375(2):122-33

BACKGROUND

Acute kidney injury (AKI) is a very common cause of morbidity and mortality in patients admitted to intensive care units [1, 2]. One of the treatments employed in its management includes renal replacement therapies (RRT) [2]. There are well-known life-threatening complications related to AKI for which RRT is traditionally used. It is, however, a matter of debate, if and when RRT may be initiated for complications directly related to AKI which are not life threatening.

WHY WAS THE STUDY CONDUCTED?

This study was conducted with an objective to compare the clinical outcomes of early and late renal replacement therapy strategies in patients with a severe acute kidney injury.

THE STUDY

The study was conducted at thirty-one hospitals in France from September 2013 to January 2016. It was funded and supervised by the French ministry of health.

HOW WAS THE STUDY CONDUCTED?

The study design was a prospective parallel group unblinded open-label randomized controlled trial. Patients admitted to the intensive care units with a diagnosis of stage 3 AKI as per Kidney Disease, Improving Global Outcomes (KDIGO) guidelines, were included in the study. Their diagnosis was compatible with acute tubular necrosis (toxic or ischemic). They were also receiving mechanical ventilation, catecholamine infusions or both. Patients were excluded from the sample if they had blood urea nitrogen of greater than 112 mg/dL, serum

potassium of greater than 6 mmol/dL, pH of less than 7.15 in the context of pure metabolic acidosis or mixed acidosis or acute pulmonary edema due to fluid overload.

Patients underwent randomization within 5 hours after the establishment of stage 3 AKI into either an early initiation RRT strategy group or a delayed initiation RRT strategy group.

In the early RRT strategy group, RRT was initiated soon after randomization. In the delayed RRT strategy group, this was begun only if one of the aforementioned complications initially used for exclusion of patients developed or if the patient remained oliguric / anuric for greater than 72 hours after randomization.

Cessation of RRT in both groups was mandatory if spontaneous diuresis was sufficient to allow for a spontaneous fall in the serum creatinine. It was considered if the output was more than 500 ml in the absence of diuretics. It was highly recommended if the output was more than 1000 ml in the absence and more than 2000 ml in the presence of diuretic therapy in 24 hours. Patients were followed up for 60 days after randomization.

OUTCOMES

The primary outcome was defined as the overall survival from randomization until death or day 60. A number of secondary outcomes were also defined

WHAT DID THE STUDY FIND?

A total of 620 patients underwent randomization. 303 Patients in the early strategy group underwent initiation of RRT within a median of 2 hours (IQ range 1-3) after randomization and a median of 4.3 hours (IQ range 2.7-5.9) after documentation of stage 3 AKI. A total of 157 of 308 patients (51%) received RRT in the delayed strategy group within median 57 hours (IQ range 25-83) after randomization. There were 303 deaths in total (150 in early strategy and 153 in delayed strategy groups, respectively). Mortality did not differ between the 2 groups (49.1 % in

Conflict of Interest: None declared

This article has been peer-reviewed

Article Submitted on: 1st October 2016

Article Accepted on: 20th October 2016

Funding Sources: None declared

Correspondence to: Dr Zain Ul Abideen

Address: Department of Internal Medicine, Shifa International Hospital, Islamabad, Pakistan

Email: abideen_87@hotmail.com

Cite this article: Abideen ZU. A comparison of early versus delayed initiation of renal replacement therapy in critically ill patients. *J Pioneer Med Sci* 2016; 7(1):5-6

the early strategy versus 48.5 % in the delayed strategy, respectively, p-value 0.79). Patients in the delayed strategy group developed fewer catheter-related blood stream infections as compared to the early strategy group (10% versus 5%, respectively, p-Value 0.03). The number of days free from RRT was significantly higher in the delayed strategy group versus early strategy group. Adequate diuresis together with no need for renal-replacement therapy was observed earlier in the delayed strategy group than in the early strategy group (P<0.001)

WHAT CONCLUSION CAN WE DRAW FROM THIS STUDY?

There was no survival difference between early and delayed initiation of RRT for patients with stage 3 AKI admitted to the intensive care unit. Delayed initiation of RRT in these patients revealed some positive outcomes; it obviated the need for RRT in almost 50 % of the patients. Consequently, the frequency of catheter-related bloodstream infections was less. The recovery in renal function was also more rapid in this group.

FUTURE PROSPECTS

Although this trial addresses stage 3 AKI and demonstrates no difference in survival between early and delayed initiation of RRT in patients admitted to the ICU, the less severe disease was not investigated. Further, ongoing trials are addressing this aspect.

REFERENCES

1. Hoste EA, Bagshaw SM, Bellomo R, et al. Epidemiology of acute kidney injury in critically ill patients: the multinational AKI-EPI study. *Intensive Care Med.* 2015; 41 (8):1411-23
2. The RENAL Replacement Therapy Study Investigators. Intensity of Continuous Renal-Replacement Therapy in Critically Ill Patients. *New England Journal of Medicine.* 2009; 361(17):1627-1638.
3. The VA/NIH Acute Renal Failure Trial Network. Intensity of Renal Support in Critically Ill Patients with Acute Kidney Injury. *New England Journal of Medicine.* 2008; 359(1):7-20.