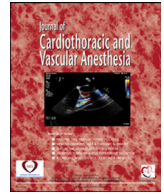




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Letter to the Editor

Deciding When to Start Renal Replacement Therapy After Cardiac Surgery in Real Life

To the Editor:

Acute kidney injury (AKI) is a frequent complication of cardiac surgery that contributes to postoperative morbidity and mortality. The timing of renal replacement therapy (RRT) remains unclear.^{1,2} The Artificial Kidney Initiation in Kidney Injury (AKIKI) trial and the Standard versus Accelerated Initiation of Renal-Replacement Therapy in Acute Kidney Injury (STARRT-AKI) trial, 2 randomized clinical trials conducted in the intensive care unit (ICU), showed no difference in mortality between an early or delayed strategy of initiation of

RRT.^{3,4} However, these studies mainly included patients with sepsis. The Early versus deLayed Initiation (ELAIN) of RRT in critically ill patients with AKI study, which mostly included postoperative cardiac surgery patients in its population, showed a decrease in mortality for early initiation of RRT.⁵ We note that STARRT-AKI and AKIKI found a decrease in RRT rate of 35% and 51%, respectively, in the delayed strategy group. On the contrary, there was no such decrease in ELAIN, with a 92% RRT rate in this group. In our cardiothoracic ICU, the physicians' practice is to start RRT late.

We performed a retrospective, observational, single-center study of patients in the cardiothoracic ICU of the University Hospital of Limoges to compare the proportion of RRT if the early criteria of the ELAIN, AKIKI, and STARRT-AKI

Table 1
Demographics

Characteristics	Overall N = 65	RRT N = 20	Without RRT N = 45	p
Age, y	69 (64-75)	71.5 (63-73.5)	68 (64-75)	0.77
Emergency	29 (45)	9 (45)	20 (44)	0.99
Previous cardiac surgery	7 (10)	2 (10)	5 (11)	0.99
CPB duration, min	100 (60-182)	148 (80-199)	122 (79-194)	0.83
Cross-clamp duration, min	45 (72-110)	90 (57-115)	84 (48-126)	0.98
Hemolysis	18 (28)	10 (50)	8 (18)	0.015
Surgical revision	8 (12)	2 (10)	6 (13)	0.99
History of high blood pressure	36 (55)	10 (50)	26 (58)	0.60
History of diabetes	18 (28)	5 (25)	13 (28)	0.99
Preoperative LVEF, %	55 (48-62)	55 (48-69)	55 (46-61)	0.51
Creatinine before surgery, $\mu\text{mol/L}$	85 (70-95)	90 (78-102)	84 (68-93)	0.08
Higher creatinine, $\mu\text{mol/L}$	247 (186-417)	469 (385-604)	210 (173-248)	< 0.0001
Urea nitrogen, mmol/L	19.5 (15-25.6)	25 (20-33)	17 (13-24)	0.0004
Creatinine at day 7, $\mu\text{mol/L}$	175 (109-267)	268 (180-392)	140 (99-215)	0.0003
Creatinine at discharge of ICU, $\mu\text{mol/L}$	135 (100-232)	220 (141-289)	117 (88-152)	0.002
KDIGO 3	33 (51)	20 (100)	13 (29)	< 0.0001
Duration of RRT, d	NA	4.5 (3.75-6.25)	0	NA
Potassium, mEq/L	5.5 (5-6)	5.75 (5.5-6.1)	5.4 (4.9-5.9)	0.1
Postoperative pH	7.26 (7.19-7.3)	7.2 (7.17-7.26)	7.28 (7.21-7.32)	0.014
Postoperative base deficit	4 (3-6)	5 (4-6)	3.5 (1.9-5.3)	0.025
Mechanical ventilation >48 h	30 (46)	15 (75)	15 (33)	0.003
Postoperative length of stay in ICU and intermediate care unit, d	14 (9-22)	23.5 (17-34)	11 (8-16)	< 0.0001
Mortality	12 (18)	6 (30)	6 (13)	0.17

NOTE. The continuous variables are presented as median and IQR (Q1-Q3). The categorical variables are presented as number (proportion). The 2 groups were compared using Mann-Whitney *U* test for continuous variables and the chi-square test or Fisher exact test for the categorical variables.

Abbreviations: CPB, cardiopulmonary bypass; ICU, intensive care unit; KDIGO, Kidney Disease Improving Global Outcomes; LVEF, left ventricular ejection fraction; RRT, renal replacement therapy.

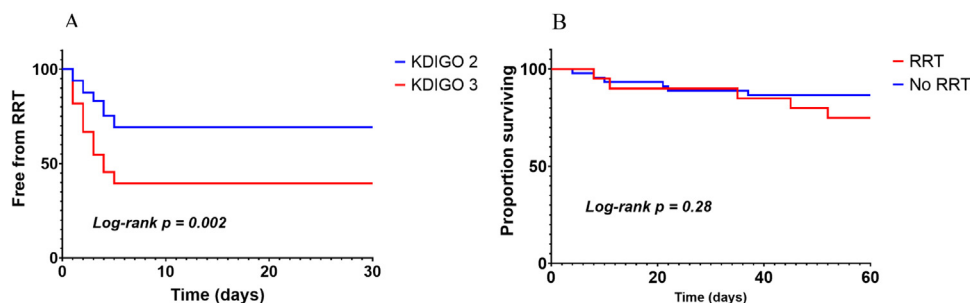


Fig 1.

studies had been chosen. All patients who developed AKI at least stage 2 according to the Kidney Disease Improving Global Outcomes (KDIGO) classification based on creatinine levels within a week after cardiac surgery were included. Patients with a history of renal transplantation or chronic kidney disease were excluded.

Of 978 patients who had been treated in our institution, 65 patients met the inclusion criteria. Demographics are provided in Table 1. Of these patients, 32 (49%) did not progress to KDIGO Stage 3 and did not require RRT, 13 (20%) progressed to KDIGO Stage 3 without RRT, and 20 (31%) progressed to KDIGO Stage 3 and required RRT. However, if we had applied the criteria for early RTT of the ELAIN and STARRT-AKI studies, all 65 patients would have required RRT. Therefore, we were able to avoid treating 45 patients (69%) with RRT (Fig 1, A). Similarly, with the early strategy criteria of the AKIKI study (KDIGO 3 patients), 33 (51%) patients would have received RRT, whereas this intervention has been avoided in 13 patients (39%) (Fig 1, A). These results were similar to those of the STARRT-AKI and AKIKI studies but not to ELAIN. Survival among patients with and without RRT was similar (Fig 1, B).

Conflict of Interest

None.

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