

Comparison of outcomes of different modalities of renal replacement therapy in patients of acute kidney injury: a single centre prospective observational study

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Abstract

Background: Acute Kidney Injury (AKI) is one of the most important causes of in-hospital mortality. The global burden of AKI continues to rise without a marked reduction in mortality. As such, the use of renal replacement therapy (RRT) forms an integral part of AKI management, especially in critically ill patients. There has been much debate over the preferred modality of RRT between continuous, intermittent and intermediate modes. While there is abundant data from Europe and North America, data from tropical countries especially the Indian subcontinent is sparse. Our study aims to provide an Indian perspective on the dialytic management of tropical AKI in a tertiary care hospital setup.

Methods: 90 patients of AKI, 30 each undergoing Continuous Renal Replacement Therapy (CRRT), Intermittent Hemodialysis (IHD) and SLED (Sustained Low-Efficiency Dialysis) were included in this prospective cohort study. At the end of 28 days of hospital stay, discharge or death, outcome measures were ascertained which included mortality, duration of hospital stay, recovery of renal function and requirement of RRT after discharge. In addition median of the net change of renal parameters was also computed across the three groups. Lastly, Kaplan Meier analysis was performed to assess the probability of survival with the use of each modality of RRT.

Results: There was no significant difference in the primary outcome of mortality between the three cohorts ($p=0.27$). However, CRRT was associated with greater renal recovery ($p=0.015$) than IHD or SLED. On the other hand, SLED and IHD were associated with a greater net reduction in blood urea ($p=0.004$) and serum creatinine ($p=0.053$).

Conclusion: CRRT, IHD and SLED are all complementary to each other and are viable options in the treatment of AKI patients.

Keywords: Acute Kidney Injury (AKI), Renal Replacement Therapy (RRT), IHD (Intermittent Hemodialysis), CRRT (Continuous Renal Replacement Therapy), SLED (Sustained Low-Efficiency Dialysis), MAP (Mean Arterial Pressure), UO (Urine Output), BU (Blood Urea), SCr (Serum Creatinine), SOFA score (Sequential Organ Failure Assessment score)

What is new? What is important?

Our study is one of the few of its kind within the Indian subcontinent, that compares all three – IHD, CRRT and SLED – in the management of AKI. Comparisons of IHD directly with SLED are scarce both in Indian and global literature. This study will help the clinicians in choosing the appropriate modality of renal replacement in critically ill patients in having different clinical scenarios.

INTRODUCTION

Acute kidney injury (AKI) is a global health hazard which can contribute to both mortality in the short term as well as long-term morbidity. AKI

may be acquired from the community or may complicate a hospital admission. A substantial proportion of AKI patients require renal replacement therapy (RRT) to sustain kidney function within the acute stage; a systematic review of 154 studies

estimated the pooled incidence of AKI to be 23.2 with 2.3% of the entire cohort requiring RRT. [1] The incidence and mortality associated with AKI are particularly high in critically ill patients admitted to intensive care units. The AKI-EPI study, conducted across 139 ICUs recorded RRT use in 13.5% of ICU patients which corresponded to about one-fourth of all AKI patients (23.5%). [2] In the ICON (Intensive Care Over Nations) audit, which included 9579 patients, AKI was diagnosed in 4727 patients according to the AKIN criteria. They noted a higher occurrence of AKI in septic patients as well as a higher requirement of RRT in this group – 20% in the sepsis group versus 5% in the non-sepsis group. [3]

Renal replacement therapy (RRT) forms an integral component of AKI management, particularly in critically ill patients. RRT encompasses a wide array of techniques ranging from hemodialysis to peritoneal dialysis and intermittent to continuous modes. Each of the modalities has its own merits and applications within the spectrum of AKI. IHD has been widely regarded as cost-effective and less labour intensive with quick and efficient reversal of uremia, hyperkalemia and acidosis and rapid removal of dialyzable toxins, but at the cost of hemodynamic instability. CRRT, on the other hand, is believed to provide more hemodynamic stability and better control of fluid and volume status albeit being costly for the patient and laborious for hospital staff. The extended duration of exposure to anticoagulation carries its own set of risks. SLED and related therapies attempt to combine the advantages of both and act as a bridge between the two. Current KDIGO guidelines state that both intermittent and continuous modes of RRT can be recommended as complementary therapies in AKI patients. [4] Many studies have been performed in order to compare these modalities with most of them having their origin in high-income countries. There is a dearth of data from middle to low-income countries especially from the Indian subcontinent. Our single-centre prospective observational study attempts to bridge this gap and provide an Indian tertiary care perspective to RRT requiring AKI.

METHODS

Study population: This observational, single-centre, prospective cohort study included all adult patients (between 18 and 75 years of age) of acute kidney injury (AKI) undergoing any

modality of renal replacement therapy (RRT), under the Department of Medicine & Nephrology, Pt. B. D. Sharma PGIMS, Rohtak. AKI was defined as per the KDIGO AKI Work Group 2012 criteria as an increase in serum creatinine by ≥ 0.3 mg/dL within 48 hours, or an increase to ≥ 1.5 times baseline within 7 days or a decrease in urine output to < 0.5 mL/kg/h for 6 hours. Standard indications for RRT were applied. Patients with previously diagnosed chronic kidney disease and the switchover from one modality of RRT to another were excluded from the study. Informed written consent was taken from all subjects included in the study.

Study sample: The sample size was calculated based on the survival rate. The study was designed to have 80% power at a significance level of 5%. According to the single-centre, randomised trial- CONVINT, survival in the IHD arm was 39.5% and 43.9% in the CRRT arm. [5] Using the formula for comparison of 2 proportions with finite population correction for single centre study and considering the local burden of RRT, the sample size was estimated to be 30.4 rounded off to - 30 in each of the 3 groups, thus including a total of 90 patients of AKI undergoing renal replacement therapy. This study was approved by biomedical research ethics committee vide no. PGIMS/Rtk/Th-IEC/19/med007.

Sub-groups: The three modalities that were compared included – CRRT, IHD and SLED, which were all performed as per the protocol of the institution and department of nephrology. CRRT was performed on Baxter Prismaflex system in the CVVHDF mode with an effluent flow rate between 25–30 mL/kg/h and blood flow rate of 100–150 mL/min for a maximum duration of 72 hours; IHD was performed on Fresenius 4008S with a dialysate flow rate of 500–800 mL/min and blood flow rate of 250–400 mL/min for a maximum duration of 4 hours; SLED was performed on Fresenius 5008S with a dialysate flow rate of 100–300 mL/min and blood flow rate of 100–200 mL/min for a maximum duration of 12 hours.

Outcomes: The endpoint of the analysis was taken as death, discharge from the hospital or 28 days of hospital stay. The primary outcome was mortality/survival and secondary outcome measures included length of hospital stay, recovery of renal function – defined as a serum creatinine value < 1.5 mg/dL at discharge and any requirement of renal replacement therapy after discharge. In addition, a few safety

outcomes were also analyzed in terms of complications associated with RRT such as – intradialytic hypotension – defined as any fall in mean arterial pressure (MAP) to <70 mm of Hg during RRT, any bleeding requiring transfusion of packed red blood cells or whole blood, arrhythmias or seizures. Lastly, the median of the net change in renal parameters including MAP, UO, BU and SCr was also calculated among the survivors.

Statistical analysis: Informed written consent was taken from all subjects before the start of the study. Apart from clinical details and laboratory investigations, the SOFA score was calculated at baseline and a score between 0 and 24 was given.[6] Renal parameters including MAP (Mean arterial pressure), urine output, blood urea and serum creatinine were measured on the day of admission and then subsequently monitored daily for 7 days and then every 3–4 days up to a maximum of 28 days. Continuous data were expressed as median and quartiles whereas nominal data were expressed as frequencies or proportions. For continuous data, Mann-Whitney U and Kruskal Wallis tests were used. Chi-square and Fisher's exact tests were used to compare the differences in frequency. A Kaplan-Meier survival analysis was also performed to determine the probability of survival with respect to the modality of RRT used. For all tests, a p-value of less than 0.05 was considered to be significant and the confidence interval was kept at 95 per cent.

RESULTS

Baseline Characteristics – The baseline characteristics of patients across all three modalities of RRT are depicted in Table 1. Patients undergoing SLED had lower haemoglobin and serum sodium concentrations while those on CRRT had lower MAP and serum creatinine values on the day of admission. SOFA scores, presence of sepsis and requirement of mechanical ventilation as well as inotropic support were all significantly higher in the CRRT cohort indicating greater severity of illness at baseline.

Outcomes – Outcome measures have been summarised in Table 2.

Primary outcome – All-cause mortality during hospital stay by day 28 was found to be 61.1%. Mortality was highest in the patients who

underwent CRRT at 70%, followed by patients on SLED at 63.3% and IHD at 50%. However, the difference in mortality between the three modalities was not found to be statistically significant (p-value = 0.270). Furthermore, it was found that survival during hospital stay was not affected by the modality of renal replacement therapy (p-value = 0.10). The Kaplan Meier curve for the same is depicted in Fig.1.

Secondary Outcome – The median duration of hospital stay (Fig. 2) was 10 days and was similar across the three study groups (p=0.078). 22.22% of patients attained recovery of renal function (Fig. 3) at discharge – with the number being significantly higher (p= 0.015) in those who underwent CRRT (30%) as compared to patients undergoing IHD (23.33%) and SLED (13.33%). Overall 12.22% of patients required RRT after discharge (Fig. 4) – none out of those who underwent CRRT, 8.88% of those who underwent IHD and 3.33 % of those who underwent SLED; the difference was not statistically significant (p-value = 0.685).

Safety Outcomes (Complications of RRT) – 17 adverse events were reported during our study out of which the most common was intradialytic hypotension. The distribution of safety outcomes – in terms of complications – between the three modalities of renal replacement therapy has been depicted in Table 3. There was no statistically significant difference in the frequency of any of the complications across all study groups including significant hypotension (p=0.071).

Net Change in renal variables (Delta values) – The delta values i.e. median for the net change in renal variables are depicted in Table 4. Delta MAP was significantly different (p=0.005) among the three groups with patients in both CRRT and SLED having a net increase in MAP of 9 mmHg and 14 mmHg respectively by the day of discharge; IHD patients, in contrast, had a net fall in MAP of 2mmHg. The median net increase in urine output from the day of RRT was highest in patients on CRRT, intermediate for SLED patients and least for IHD patients (p=0.007). The reduction in blood urea was significantly more in patients who underwent SLED (163) and IHD (121.5) than CRRT (44.5) with a p-value of 0.004. Similarly, the net decrease in serum creatinine was higher in SLED and IHD than in CRRT with a trend towards significance (p=0.053).

Table 1

Distribution of Baseline characteristics within study population (N=90)

Variables	CRRT “C” (n=30)	IHD “I” (n=30)	SLED “S” (n=30)	Total (n=90)	p-value	Post hoc (p<0.05)
Age (Years)	36.5(27, 54.25)	36.5(26.75, 57.25)	53.5(33.5, 61.25)	40(28.75,57.25)	0.035	CS ; IS
Male Sex	20(66.7)	19(63.3)	15(50)	54 (60)	0.378	
COMORBIDITIES						
Diabetes	7(23.3)	4(13.3)	8(26.7)	19(21.1)	0.420	
Hypertension	2(6.7)	5(16.7)	8(26.7)	15(16.7)	0.115	
Cardiovascular disease	3(10)	0	5(16.7)	8(8.9)	0.090	
Hepatic disease	8(26.7)	4(13.3)	5(16.7)	17(18.9)	0.390	
Pulmonary disease	3(10)	2(6.7)	1(3.3)	6(6.7)	0.868	
LABORATORY INVESTIGATIONS						
Haemoglobin (g/dL)	10.8 (9.05, 12.23)	10.2 (8.43, 13.28)	8.2 (7, 9.48)	9.4 (8, 11.72)	<0.01	CS ; IS
pH	7.24 (7.16, 7.31)	7.26 (7.12, 7.34)	7.255 (7.2, 7.35)	7.25 (7.17, 7.35)	0.726	
Serum HCO ₃ ⁻ (meq/L)	16.15 (11.85, 18.75)	14.3 (8.98, 18.38)	14.8 (11.68, 18.93)	15.4 (11.35, 18.37)	0.585	
Serum Na ⁺ (meq/L)	134(128, 138)	136 (132, 139)	131 (127.5, 135.25)	134 (129,138)	<0.01	SI
Serum K ⁺ (meq/L)	4.5 (3.41, 5.5)	4.58 (3.75, 5.2)	5.035 (4.4, 5.66)	4.7 (3.85,5.5)	0.188	
Mean Arterial Pressure (mmHg)	66 (65, 70)	95.5 (75.75, 110.5)	68.5 (65.75, 73)	70 (66,80.25)	<0.01	IS ; CI
Urine Output (mL/day)	200 (50, 500)	337.5 (125, 525)	300 (100, 500)	275 (100,500)	0.298	
Blood Urea (mg/dL)	101.5 (69, 121.5)	115.5 (72, 159)	121.5 (91.25, 166.25)	111 (78,156)	0.177	
Serum Creatinine (mg/dL)	3 (2.05, 3.83)	3.69 (2.35, 5.75)	4.25 (3.43, 6.45)	3.54 (2.35,5.4)	<0.01	CS
Presence of Sepsis	18(60)	11(42.3)	13(46.4)	42(46.7)	0.095	
MARKERS OF DISEASE SEVERITY						
SOFA scores	12 (10, 14.25)	7 (4.75, 9.25)	9.5 (7, 12)	10 (7,12)	<0.01	IS ; CI
Mechanical Ventilation	16(53.3)	7(23.3)	4(13.3)	27(30)	0.002	
Single Inotrope (at least)	27(90)	4(13.3)	22(73.3)	53(58.9)	<0.001	
Dual Inotrope	21(70)	1(3.3)	10(33.3)	32(35.6)	<0.001	
PARAMETERS OF RRT						
Time to initial RRT (days)	3 (2, 4)	4 (2.75, 4.25)	3 (2.75, 4)	3 (2.74)	0.549	
Frequency	1 (1, 1.25)	3 (2, 4)	3 (2, 4.25)	2 (1,3.25)	<0.01	CS; CI

Table 2

Primary and Secondary Outcomes (N=90)

Variables	CRRT (n=30)	IHD (n=30)	SLED (n=30)	Total (n=90)	p-value
Mortality (Non-survivors)	21(70)	15(50)	19(63.3)	55 (61.1)	0.270
In hospital stay (days)	8 (6, 12)	11 (8.75, 14.5)	10 (7.75, 14.25)	10 (7,14)	0.078
Recovery of renal function	9 (30)	7(23.33)	4(13.33)	20 (22.22)	0.015
RRT after Discharge	0(0)	8(8.88)	3(3.33)	11(12.22)	0.685
Continuous data presented in Median (Q1, Q3) and compared by Mann Whitney U test, Qualitative data presented as frequency (%), compared by Chi-square test. P value <0.05 significant					

Table 3

Safety Outcomes – Complications of RRT (N=90)

Variables	CRRT (n=30)	IHD (n=30)	SLED (n=30)	Total (n=90)	p-value
Bleeding	3(10)	1(3.3)	2(6.7)	6(6.7)	0.868
Arrhythmia	1(3.3)	0	0	1(1.1)	0.999
Seizures	1(3.3)	0	0	1(1.1)	0.999
Intradialytic hypotension	0	5(16.7)	4(13.3)	9(10)	0.071
Data presented in Frequency (%), compared by Chi-square test. P value <0.05 significant					

Table 4

Distribution of net change in renal parameters (Delta values) during the course of RRT (N=90)

Variables	CRRT (n=30)	IHD (n=30)	SLED (n=30)	Total (n=90)	p-value
Delta MAP (mmHg)	-9 (-26.5, 3.5)	2 (-1,8)	-14 (-20,-3)	-4 (-15,2)	0.005
Delta UO (mL/day)	-900 (-1150, -800)	-300 (-862.5, -200)	-600 (-800, -300)	-700 (-900, -300)	0.007
Delta BU (mg/dL)	44.5 (35.25, 97.25)	121.5 (72.5, 157.5)	163 (99, 212)	116 (57.5, 167.5)	0.004
Delta SCr (mg/dL)	3.5 (2.25,4.7)	4.7 (3.4,6.5)	5.4 (4.2,6.16)	4.7 (3.4, 6.16)	0.053
Data presented in Median (Q1, Q3), compared by Mann Whitney U test. P value <0.05 significant ; All delta parameters calculated as [Value on day of first RRT] - [Value on day of discharge]					

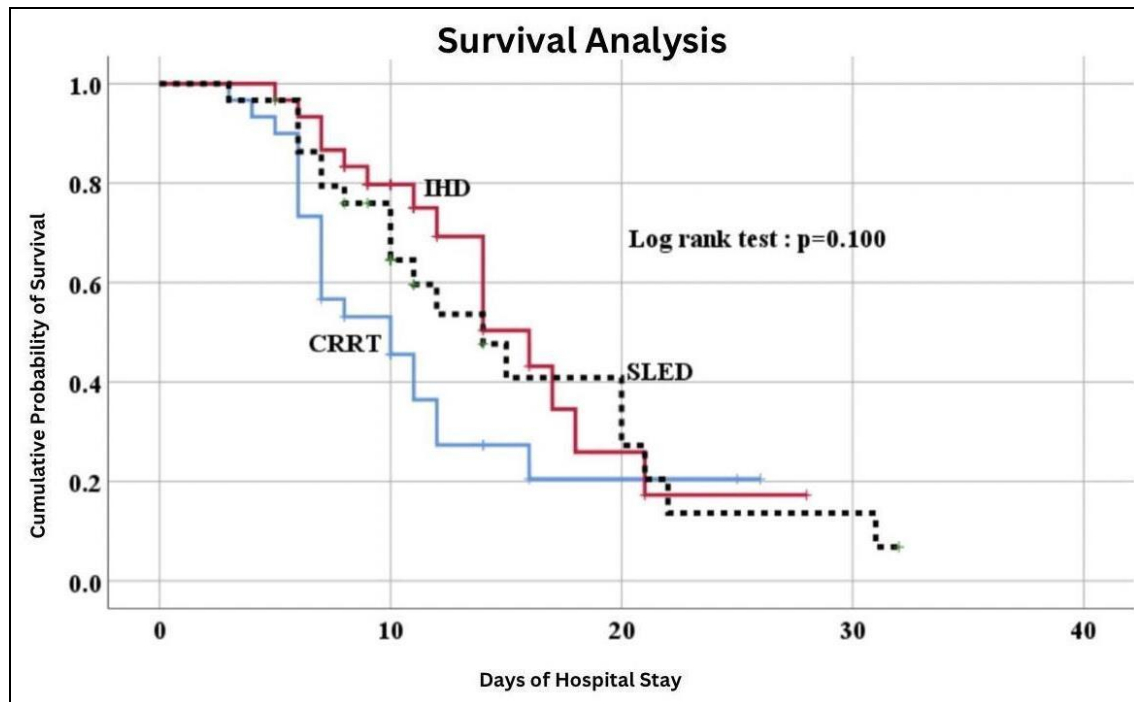


Figure 1. Kaplan Meier graph showing cumulative probability of survival with respect to the three modalities of RRT. No statistically significant difference in survival was found ($p=0.100$)

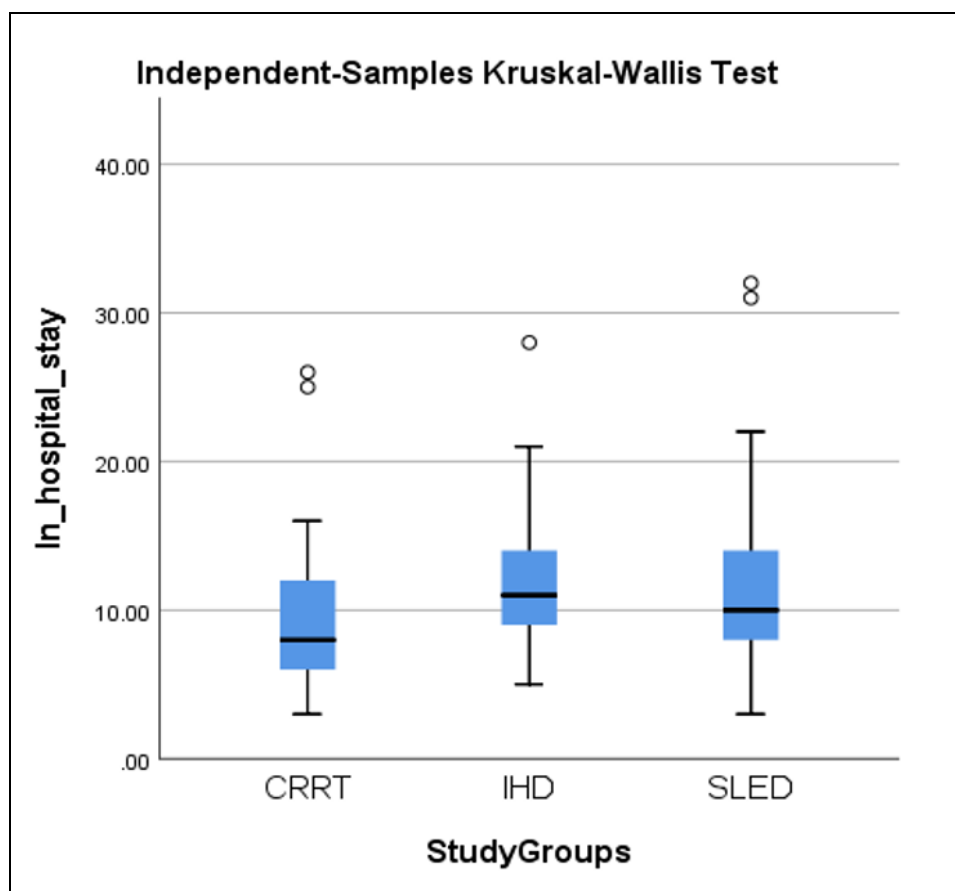


Figure 2. Distribution of median duration of hospital stay across the three modalities of RRT. No statistically significant difference was found ($p=0.078$)

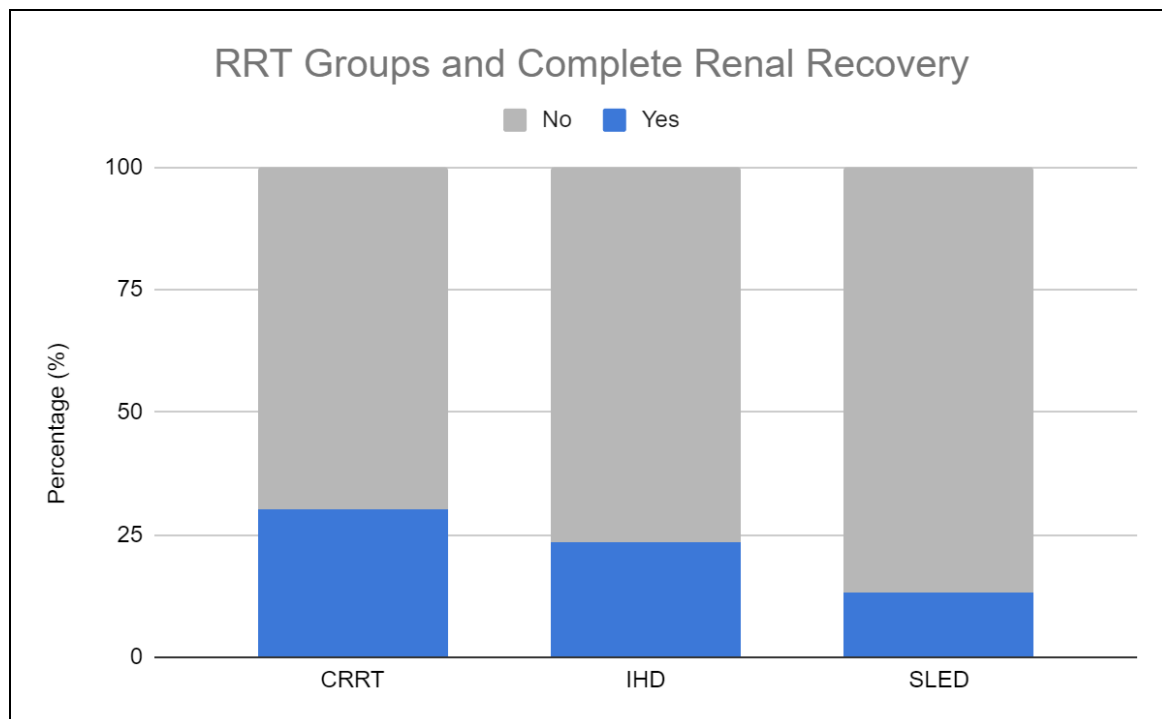


Figure 3. Distribution of percentage of individuals with recovery of renal function – defined by discharge Scr value of <1.5 mg/dL – across the three modalities of RRT. CRRT was associated with significantly greater renal recovery $p=0.015$)

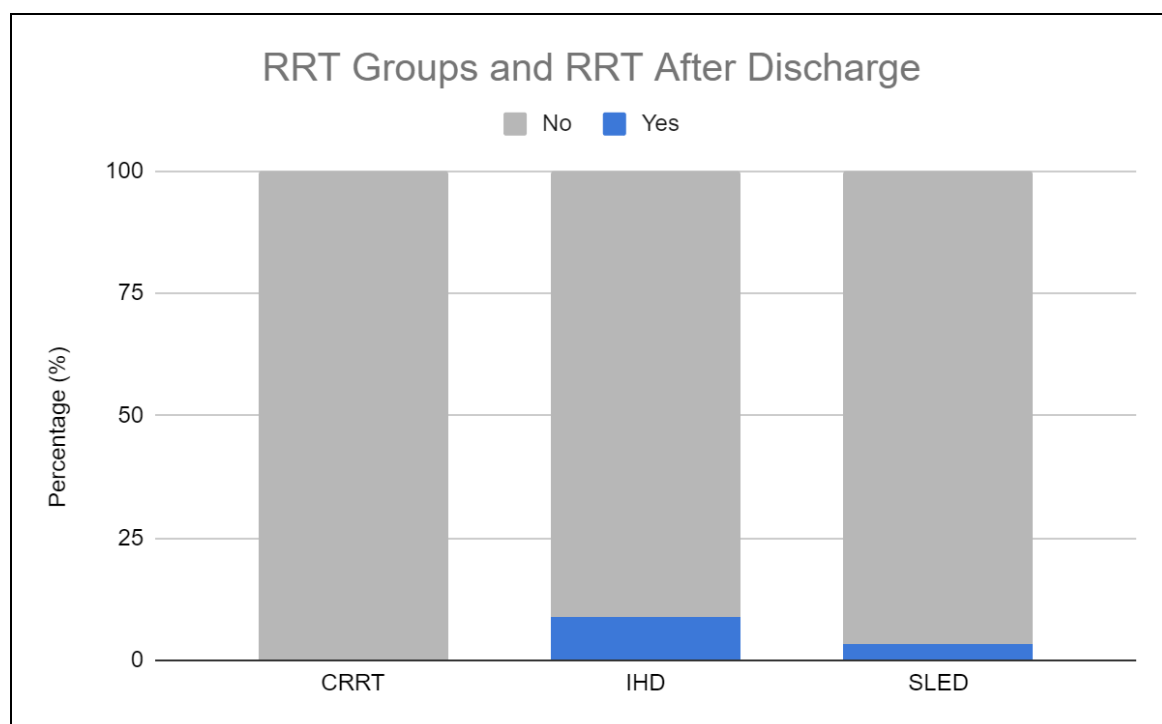


Figure 4. Distribution of percentage of patients with requirement of RRT after discharge from hospital. No significant difference was found across the three groups ($p=0.685$)

DISCUSSION

In the present study, we observed no significant difference in terms of mortality at 28 days of hospital follow-up and no difference in the probability of survival amongst the three modalities of RRT. Our observations are largely in agreement with those obtained from most of the large meta-analyses that have failed to demonstrate a significant difference in mortality with one modality over another.[7–11] Few exceptions to this general observation exist; Zhang *et al.* observed lower mortality in the SLED group when compared with CRRT within observational studies of their meta-analysis.[12] Zhao *et al.*, in their meta-analysis, found that the only statistically significant difference was in terms of ICU mortality which was higher in the CRRT subset as compared to the IHD cohort.[13] Lastly, in one of the most recent meta-analyses spanning 30 randomized trials, and including IHD, CRRT, SLED and PD (Peritoneal Dialysis), continuous therapy was associated with greater mortality when it was pitted against SLED.[14]

In terms of observational studies, the results are slightly more variable. In older studies, while unadjusted mortality in the CRRT cohort was greater than IHD, after adjustment for severity of illness, this difference was not statistically significant.[15–16] In contrast, in a large recent prospective study, De Corte *et al.* reported that the greater risk of mortality within the CRRT cohort persisted even after adjustment for confounding factors.[17] A similarly higher rate of mortality associated with CRRT was reported by Bonnassieux *et al.* in their large multi-ICU observational study encompassing upwards of 50000 patients.[18] Truche *et al.*, on the other hand, observed no discrepancy between CRRT and IHD when it came to mortality rates both at 30 days and at 6 months.[19]

Among the older RCTs, Augustine *et al.* and Uehlinger *et al.* both observed no difference between CRRT and IHD cohorts with respect to mortality and survival respectively.[20–21] While Mehta *et al.* did observe higher rates of mortality within the CRRT sub-groups, the hazard ratios were much lower once corrected for the severity of illness.[22] Most of the newer RCTs which compared CRRT to either IHD or SLED found no statistically significant difference in mortality in terms of the modality of RRT.[5,23–25]

In the present study, the duration of hospital stay and requirement of RRT after discharge was not significantly different amongst the three study groups. However, patients undergoing CRRT had significantly greater renal recovery as compared to

the rest of the two modes. Most observational studies have found CRRT to have better recovery of renal function and less dialysis dependence in comparison to IHD.[18,26] In terms of the two studies on long-term dialysis dependence, Bell *et al.* found that significantly more patients on IHD (16.5%) required chronic RRT, while only 8.3% on CRRT suffered the same fate.[27] In the case of the study by Wald *et al.*, which also adjusted for pre-existing kidney dysfunction, 21% of patients in the CRRT group needed chronic dialysis which was significantly lower than in the IHD group (26%, p -value <0.0001).[28]

The randomised trials and meta-analyses have found more even rates of renal recovery, freedom from RRT and long-term RRT between patients undergoing initial IHD and CRRT as well as SLED.[5,7,12,13,23,24,25,29,30] However, in the most recent meta-analysis by Ye *et al.*, CRRT and IHD were both found to be inferior to SLED while CRRT was superior to IHD in terms of recovery of renal function. In the same study, the duration of RRT support was also studied. While there was no difference in comparison of CRRT vs IHD and CRRT vs SLED, IHD was associated with a longer duration of requirement of RRT when compared to SLED.[13]

Superior renal recovery within the CRRT subset in our study can also be attributed to two confounding factors. First, patients who underwent IHD and SLED had much higher baseline creatinine values as compared to those who underwent CRRT and even achieved a greater net reduction in serum creatinine. This is evidenced by a greater median change in blood urea and serum creatinine in the former two groups than in the CRRT cohort. Secondly, patients who underwent IHD and SLED had less severe disease as evidenced by lower baseline SOFA scores and hence were more likely to recover from their primary ailment earlier. As a result, they were more likely to get discharged earlier and be advised outpatient RRT before complete recovery of renal function could be documented. The same can also explain the greater frequency of dialysis required after discharge in both IHD and SLED cohorts.

Complications of RRT have been analysed in only a few studies. In one such study, Vinsonneau *et al.* reported similar rates of all complications between patients undergoing CRRT and IHD, except for a greater incidence of hypothermia in the CRRT subset. They reported an overall incidence of hypotension in 39% of patients with IHD and 35% of patients with CRRT.[23]

Bagshaw *et al* also compared certain complications of therapy and found that CRRT had to its advantage lesser episodes of hypotension (OR, 0.66, $p=0.03$) as well as less risk of arrhythmia (OR, 0.46, $p=0.55$). However, there was no difference in terms of bleeding complications (OR, 1.07, $p=0.87$). [8] Lastly, in an RCT conducted in an Indian ICU, SLED and CRRT were compared in septic shock patients in terms of hemodynamic stability in terms of the vasopressor index and vasopressor dependency as objective measures. They found no significant difference between the two and concluded that SLED was a viable alternative to CRRT in septic shock patients. [31] A summary of recent studies pertinent to the current discussion is presented in Table 5.

Our study is one of the few of its kind within the Indian subcontinent, that compares all three – IHD, CRRT and SLED – in the management of AKI. Comparisons of IHD directly with SLED are scarce both in Indian and global literature. While the observational style of our study and the lack of randomization may be considered a drawback, it paints an accurate picture of the on-ground treatment of AKI in a tertiary hospital set up in India, where patients are allotted a particular modality not only

based on their clinical profile but also their economic means. Lastly, outcome measures also included safety outcomes in terms of complications during renal replacement therapy which have only been stressed in a few studies. Our study did suffer from some limitations. First, the lack of randomization in our study led to patients with more severe illness undergoing CRRT and thus attributed a baseline higher risk of mortality in this subset. Second, the criterion used for renal recovery was a discharge creatinine value of <1.5 mg/dL instead of the mean change in serum creatinine which may have overestimated renal recovery in patients on CRRT. Third, the long-term effects of the type of RRT modality could not be assessed as follow-up was restricted to only 28 days.

In conclusion, our single-centre prospective study attempts to put forward an Indian tertiary centre perspective to contribute to the already huge global data for RRT requiring AKI. There was no difference in survival or complications that could be attributed to any of the three modalities and the use of each one of them should not be thought of as competitive, but rather complementary in the efficient management of acute kidney injury.

Table 5

Summary of recent observational studies, RCTs and Meta-analyses comparing CRRT, IHD and SLED

Study	Comparison groups	Outcome -Mortality	Outcome - Recovery of renal function
Observational			
Bell <i>et al.</i> ⁽²⁷⁾	CRRT vs IHD	No significant difference at 90 days	Lesser requirement of chronic RRT with CRRT (8.3%) vs IHD (16.5%)
Wald <i>et al.</i> ⁽²⁸⁾	CRRT vs IHD	No significant difference	Lesser requirement of chronic RRT with CRRT (21%) vs IHD (26%, $p<0.0001$)
Liang <i>et al.</i> ⁽²⁶⁾	CRRT vs IHD	-	Greater with CRRT at 90 days (75.4% vs 66.6%) No significant difference at 1 year (59.6% vs 54.1%)
Truche <i>et al.</i> ⁽¹⁹⁾	CRRT vs IHD	No significant difference at 30 days (HR 1.00, $p=0.97$)	-
De corte <i>et al.</i> ⁽¹⁷⁾	CRRT vs IHD	Greater with CRRT ($p<0.0001$)	-
Bonnassieux <i>et al.</i> ⁽¹⁸⁾	CRRT vs IHD	Greater with CRRT (61% vs 45%, $p<0.0001$)	Greater with CRRT (84.3% vs 87.2%, $p<0.0002$)
RCTs			
Hemodiafe ⁽²³⁾	CRRT vs IHD	No significant difference at 60 days (mean difference of 1.1%)	No significant difference in requirement of RRT after discharge (10% in IHD and 7% in CRRT)

Table 5 (continued)

Study	Comparison groups	Outcome -Mortality	Outcome - Recovery of renal function
Observational			
Abe <i>et al.</i> ⁽²⁴⁾	CRRT vs SLED	No significant difference	No significant difference
Schwenger <i>et al.</i> ⁽²⁵⁾	CRRT vs SLED	No significant difference (p=0.43)	-
CONVINT ⁽⁵⁾	CRRT vs IHD	No significant difference in survival at 14 days after end of RRT (p=0.81)	No significant difference in number of patients on RRT at 60 days (p=0.90)
Meta-analyses			
Schneider <i>et al.</i> ⁽³⁰⁾	CRRT vs IHD	-	Greater with IHD for observational (RR =1.99) no significant difference for RCTs (RR= 1.15)
Zhang <i>et al.</i> ⁽¹²⁾	CRRT vs SLED	No significant difference within RCTs (RR 0.9, p=0.3)	No significant difference (RR 1.12, p= 0.4)
Schoenfelder <i>et al.</i> ⁽⁷⁾	CRRT vs IHD	Greater in CRRT within observational studies (RR =1.17) No significant difference within RCTs	Greater in CRRT within observational studies (RR = 1.10) No significant difference within RCTs
Nash <i>et al.</i> ⁽²⁹⁾	CRRT vs IHD CRRT vs SLED	No significant difference	No significant difference
Zhao <i>et al.</i> ⁽¹³⁾	CRRT vs IHD CRRT vs SLED	Greater in ICU with CRRT as compared to IHD (RR=1.21, p=0.402)	No significant difference (p=0.269)
Ye <i>et al.</i> ⁽¹⁴⁾	CRRT vs IHD vs SLED vs PD	Greater with CRRT as compared to SLED (RR=1.06) and PD (RR= 1.16) Lesser with PD as compared to SLED (RR=0.91)	Lesser in CRRT (0.88) and IHD (0.77) as compared to SLED

Introducere: Leziunea renală acută (AKI) este una dintre cele mai importante cauze de mortalitate din spital. Morbiditatea AKI continuă să crească fără o reducere semnificativă a mortalității. Ca atare, utilizarea terapiei de substituție renală (RRT) face parte integrantă din managementul AKI, în special la pacienții în stare critică. Au existat multe dezbateri cu privire la modalitatea preferată de RRT între modurile continue, intermitente și intermediare. Deși există date abundente din Europa și America de Nord, datele din țările tropicale, în special din subcontinentul indian, sunt rare. Studiul nostru își propune să ofere o perspectivă indiană asupra managementului dialitic al AKI tropicală într-un spital de îngrijire terțiară.

Metode: 90 de pacienți cu AKI, 30 fiecare supuși CRRT, IHD și SLED au fost incluși în acest studiu de cohortă prospectiv. La sfârșitul a 28 de zile de spitalizare, externare sau deces, au fost analizate mortalitatea, durata spitalizării, recuperarea funcției renale și necesitatea RRT după externare. În plus, mediana modificării nete a parametrilor renali a fost de asemenea calculată în cele trei grupuri. În cele din urmă, analiza Kaplan Meier a fost efectuată pentru a evalua curbele de supraviețuire cu utilizarea fiecărei modalități de RRT.

Rezultate: Nu a existat nicio diferență semnificativă în ceea ce privește rezultatul primar al mortalității între cele trei cohorte (p=0,27). Cu toate acestea, CRRT a fost asociat cu o recuperare renală mai mare (p=0,015) decât IHD sau SLED. Pe de altă parte, SLED și IHD au fost asociate cu o reducere netă mai mare a ureei sanguine (p=0,004) și a creatininei serice (p=0,053).

Concluzie: CRRT, IHD și SLED sunt toate complementare unele cu altele și sunt opțiuni viabile în tratamentul pacienților cu AKI.

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