

To Compare Acute Peritoneal Dialysis with Sustained Low-efficiency Dialysis in Critically Ill Patients Requiring Renal Replacement Therapy

Sir,
Acute peritoneal dialysis (PD) is the oldest form of renal replacement therapy (RRT), whereas sustained low-efficiency dialysis (SLED) is a newer hybrid therapy between continuous RRT and intermittent hemodialysis. There are very few studies comparing these two modalities of RRT,^[1] so we undertook a prospective study to evaluate outcomes of patients receiving intermittent PD (IPD) using rigid peritoneal catheter with SLED. The decision for instituting IPD or SLED was of the treating unit.

Critically ill patients with dialysis-requiring acute kidney injury (AKI) more than 18 years of age admitted to our hospital from July 2013 to December 2014 were enrolled. Patients who died within 12 h of initiating RRT, those having preexisting chronic kidney disease/or end-stage renal disease, pregnant patients and subjects with obstructive uropathy were excluded from this study. Acute physiology and chronic health II and daily Sequential organ failure assessment scores were calculated. Kt/V

urea was calculated per session of RRT. The primary outcome of the study was patient and renal survival at 28 and 90 days. Secondary outcomes were an improvement in metabolic and clinical parameters (hyperkalemia, acidosis, encephalopathy, and fluid overload) and length of hospital stay. Complications of IPD and SLED were also noted.

Thirty-three patients were eligible for enrollment out of which 17 underwent IPD and 16 underwent SLED. Patients in both groups had similar baseline characteristics. A total of 54 sessions of IPD were carried out with average dialysate volume of 16.65 L/session and mean ultrafiltration achieved was 2.4 L/session. A total of fifty sessions of SLED were carried out. Weekly mean Kt/V achieved in the SLED and IPD group was 4.7 and 2.02, respectively ($P < 0.001$). Ultrafiltration achieved with IPD was significantly higher during first two sessions (2.35 L and 2.7 L) as compared to the ultrafiltration achieved with SLED (1.2 L and 1.3 L) ($P = 0.03$ and $P = 0.018$). At the end of the study, patient survival at day 28 and 90 was 11.6

Table 1: Comparison of various clinical parameters of patients' treated with IPD and SLED

Parameter	Modality		Improvement in parameters					
			1 st session		2 nd session		3 rd session	
CVP >14 cm	17	IPD 35.2% (n=6)	17	17.6% (n=3)	14	7.1% (n=1)	5	0
	16	SLED 62.5% (n=10)	16	50% (n=8)	10	50% (n=5)	8	50% (n=4)
P	0.16		0.07		0.05		0.10	
pH <7.2	17	IPD 52.9% (n=9)	17	23.5% (n=4)	14	21.4% (n=3)	4	25% (n=1)
	16	SLED 37.5% (n=6)	16	12.5% (n=2)	09	11.1% (n=1)	5	0
P	0.49		0.65		0.63		0.44	
Bicarbonate <15	17	IPD 76.4% (n=13)	17	52.9% (n=9)	14	42.8% (n=6)	4	50% (n=2)
	16	SLED 68.7% (n=11)	16	56.2% (n=9)	10	20% (n=2)	7	14.2% (n=1)
P	0.7		1		0.38		0.49	
GCS <15	17	IPD 87.5% (n=14)	15	73.3% (n=11)	12	75% (n=9)	4	50% (n=2)
	16	SLED 87.5% (n=14)	13	100% (n=13)	10	90% (n=9)	7	85.7% (n=6)
P	0.48		0.10		0.59		0.49	
Potassium >5.5	17	IPD 35.2% (n=6)	17	0	14	7.1% (n=1)	5	0
	16	SLED 18.7% (n=3)	16	12.5% (n=2)	10	0	7	14.2% (n=1)
P	0.43		0.22		1		1	
Urine out 400 ml	17	IPD 82.3% (n=14)	17	64.7% (n=11)	14	57.1% (n=8)	5	50% (n=2)
	16	SLED 93.7% (n=15)	16	93.7% (n=15)	10	91.6% (n=11)	8	100% (n=5)
P	0.6		0.08		0.08		0.16	
Blood Urea >150 mg	17	IPD 29.41% (n=5)	17	29.41% (n=5)	14	21.4% (n=3)	5	20% (n=1)
	16	SLED 58.8% (n=10)	16	20% (n=3)	10	20% (n=2)	8	12.5% (n=1)
P	0.08		0.68		1		1	

CVP: Central venous pressure, GCS: Glasgow coma scale. The values in parenthesis represent number of subjects with abnormal parameters, SLED: Sustained low efficiency hemodialysis, IPD: Intermittent peritoneal dialysis

and 6.2% in IPD group vis-a-vis 5.8 and 6.2% in SLED group. Hyperkalemia was resolved in 100% of patients in IPD group after the first session. Secondary outcomes are mentioned in Table 1.

The only study comparing PD and extended hemodialysis was carried by Ponce *et al.*^[2] The authors randomized 143 cases of Intensive Care Unit (ICU) patients requiring dialysis to high volume peritoneal dialysis or extended hemodialysis and found no significant difference in the mortality rate, renal recovery, need of chronic dialysis, and median ICU. The results of the present study are similar to that reported by Ponce *et al.* To conclude, in the management of dialysis-requiring AKI in critically ill patients, IPD is comparable to SLED in terms of correction of metabolic and clinical derangements.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

**B. Datt, R. Ramachandran, N. Sharma¹,
V. Kumar, M. Rathi, H. S. Kohli, V. Jha,
K. L. Gupta**

*Departments of Nephrology and ¹Internal Medicine, Postgraduate
Institute of Medical Education and Research, Chandigarh, India*

Address for correspondence:

*Prof. K. L. Gupta,
Department of Nephrology, Postgraduate Institute of Medical
Education and Research, Chandigarh, India.
E-mail: klgupta@hotmail.com*

References

1. Gabriel DP, Caramori JT, Martin LC, Barretti P, Balbi AL. Continuous peritoneal dialysis compared with daily hemodialysis in patients with acute kidney injury. *Perit Dial Int* 2009;29 Suppl 2:S62-71.
2. Ponce D, Berbel MN, Abrão JM, Goes CR, Balbi AL. A randomized clinical trial of high volume peritoneal dialysis versus extended daily hemodialysis for acute kidney injury patients. *Int Urol Nephrol* 2013;45:869-78.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

Access this article online	
Quick Response Code: 	Website: www.indianjnephrol.org
	DOI: 10.4103/ijn.IJN_167_16

How to cite this article: Datt B, Ramachandran R, Sharma N, Kumar V, Rathi M, Kohli HS, *et al.* To compare acute peritoneal dialysis with sustained low-efficiency dialysis in critically ill patients requiring renal replacement therapy. *Indian J Nephrol* 2017;27:412-3.

© 2017 Indian Journal of Nephrology | Published by Wolters Kluwer - Medknow