



Large volume paracentesis in cirrhotic patients with acute kidney injury is not associated with worsening of renal function; analysis of a multi-institutional cohort

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Background

Effect of large volume paracentesis on renal function in cirrhotic patients with ongoing acute kidney injury has not been studied in detail, and large volume paracentesis (LVP) is often avoided in these patients due to concerns of worsening renal injury. We studied the association between volume removed on paracentesis and outcomes of acute kidney injury.

Methods

We performed a retrospective cohort study of patients at two institutions in West Virginia—Marshall University and West Virginia University. IRB approval was obtained at both institutions. Patients with acute kidney injury at the time of paracentesis were included in the study. A retrospective chart review was then performed, and variables of interest were collected. Data was then de-identified and then pooled for analysis.

Variable	Total population
Age in years, Mean (SD)	53.61 years (SD: ±16.20)
Male Gender	103 (63.6%)
Child Class	
B	51 (31.5%)
C	111 (68.5%)
Study site:	
MU	62 (38.3%)
WVU	100 (61.7%)
MELD-Na	Mean: 24.6 (SD: ±8.39)
Chronic kidney disease	63 (38.89%)
>4L removed during paracentesis (LVP)	81 (50.0%)
Albumin administration with paracentesis	60 (37%)
Worsening of AKI after paracentesis	48 (29.63%)
Requirement of RRT	19 (11.73%)

Table 1. Baseline Characteristics

Results

One-hundred and sixty-two patients were included in the final cohort. The mean age of study participants was 61.10 years (SD: ±11.70); the population was predominantly male (63.6%). Alcohol was the most common etiology (43%), followed by NASH (30%). One hundred and eleven patients had Child C cirrhosis (68.5%). Pre-renal acute kidney injury was the most common etiology prior to paracentesis (51%); eighty-six patients had KDIGO stage 1 acute kidney injury while 37 patients and 39 patients had Stage 2 and Stage 3 respectively. Forty-eight participants (29.6%) experienced a worsening of creatinine after paracentesis.

Large volume paracentesis (4L or greater) was performed on 81 patients while the rest had less than 4L removed; the groups were well matched with no statistically significant difference in baseline characteristics. There was no difference in the proportion of patients experiencing worsening of renal function after paracentesis, in the proportion of patients who experienced eventual complete resolution of acute kidney injury (p-value = 0.55), or in the proportion of patients that requirement renal replacement therapy (p-value = 0.51).

Multivariable regression analysis was conducted incorporating age, gender, CKD, MELD-Na score, albumin administration, and amount of volume removed during paracentesis, revealing CKD as the only covariate significantly associated with worsening renal function after paracentesis (p-value = 0.003). Large volume removal during paracentesis was not associated with worsening of renal function (p-value = 0.61).

Variable	Univariable (p)	Multivariable (p)
Age	0.17	0.56
Gender	0.21	0.08
MELD-Na	0.87	0.26
Albumin administration	0.25	0.11
Large volume removal (>4L)	1.00	0.61
CKD	0.001*	0.003*

Table 2. Univariate and Multivariate Analysis

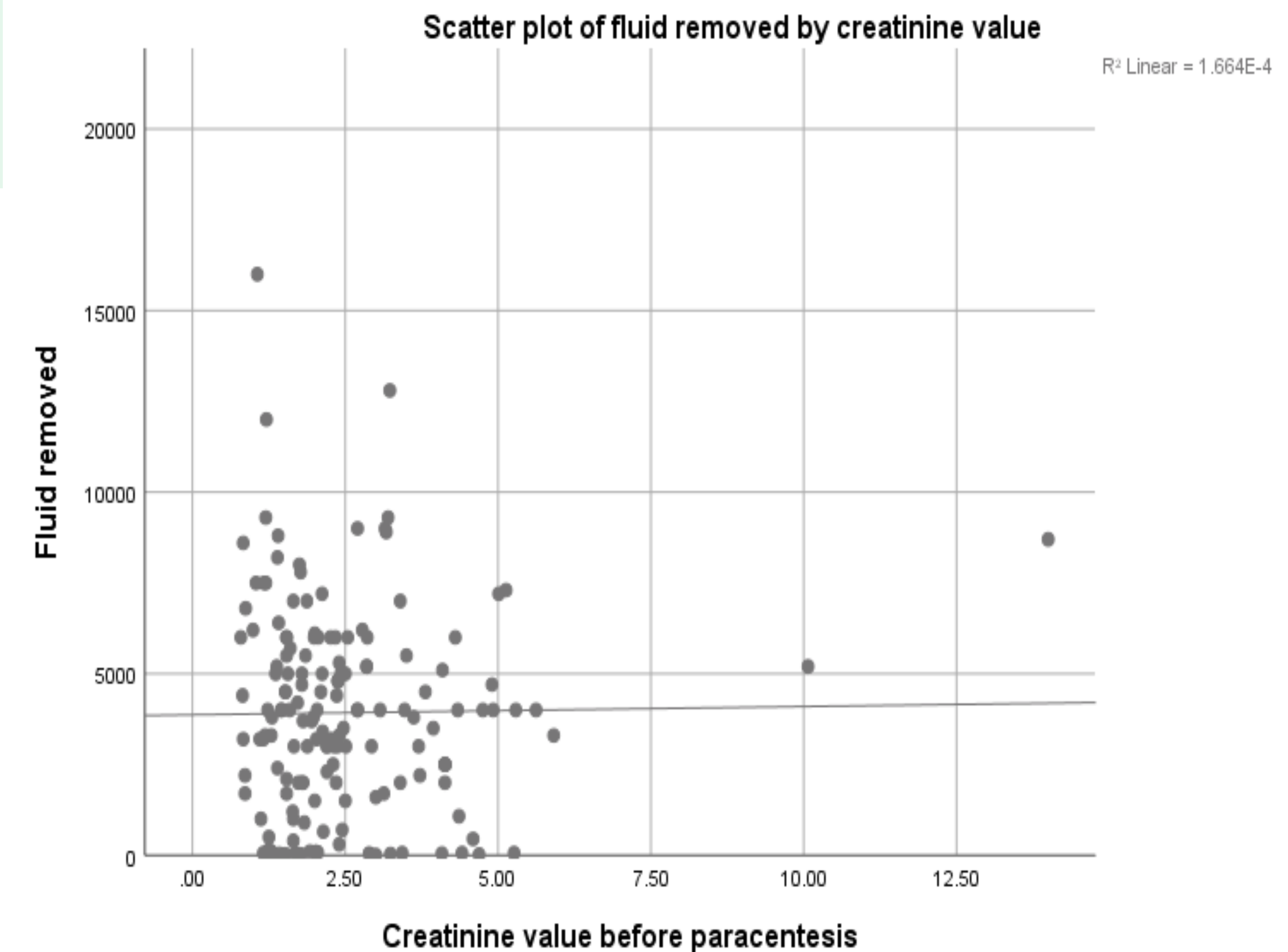


Figure 1. Fluid Removed by Creatinine Values

Conclusion

Large volume paracentesis is not associated with worsening renal function, when compared to small volume paracentesis, in cirrhotic patients with pre-existing acute kidney injury.

References

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