

### Introduction

- Patients with acute pancreatitis (AP) as well as acute kidney injury (AKI) have been shown to have increased mortality.
- Early aggressive fluid resuscitation was previously the mainstay in management of acute pancreatitis, however recent studies have demonstrated a higher incidence of fluid overload with this strategy.
- As such, the optimal fluid management strategy for acute pancreatitis in patients with concomitant AKI remains uncertain.
- We aim to characterize the presentation, management, and clinical outcomes of patients who present with AP and AKI.

### Methods and Materials

- As part of an ongoing prospective study of patients presenting with AP between 2015 and 2021 to a safety-net tertiary care hospital, we evaluated patients who presented with an AKI.
  - *AKI: Defined as a creatinine increase of  $\geq 0.3$ mg/dL from baseline or increase in serum creatinine to 1.5 times baseline.*
- Our primary outcome was the development of volume overload as evidenced by granular data such as pleural effusions or peripheral edema.
- Secondary outcomes were mortality, ICU admission, development of severe pancreatitis, and length of stay.
- Categorical variables were compared using chi square analysis and continuous variables were compared using Student's t-test. Logistic and linear multivariate regression models were performed controlling for baseline characteristics (age, sex, gender, race) and clinical features such as etiology of pancreatitis and comorbidities.

### Results

#### Presentation

- Between January 2015 and March 2021, 1494 patients presented to LAC+USC with acute pancreatitis; among those, 214 presented with an AKI (14%).
- The mean admission creatinine in the AKI cohort was 2.07 mg/dL. Baseline characteristics are described in table 1.
- Patients with co-morbidities such as diabetes mellitus (DM), congestive heart failure (CHF), and cirrhosis were more likely to present with AKI.
- Patients with an AKI were more likely to have SIRS on presentation and require admission to the intensive care unit (ICU).

**Table 1.** Baseline characteristics of patients on presentation

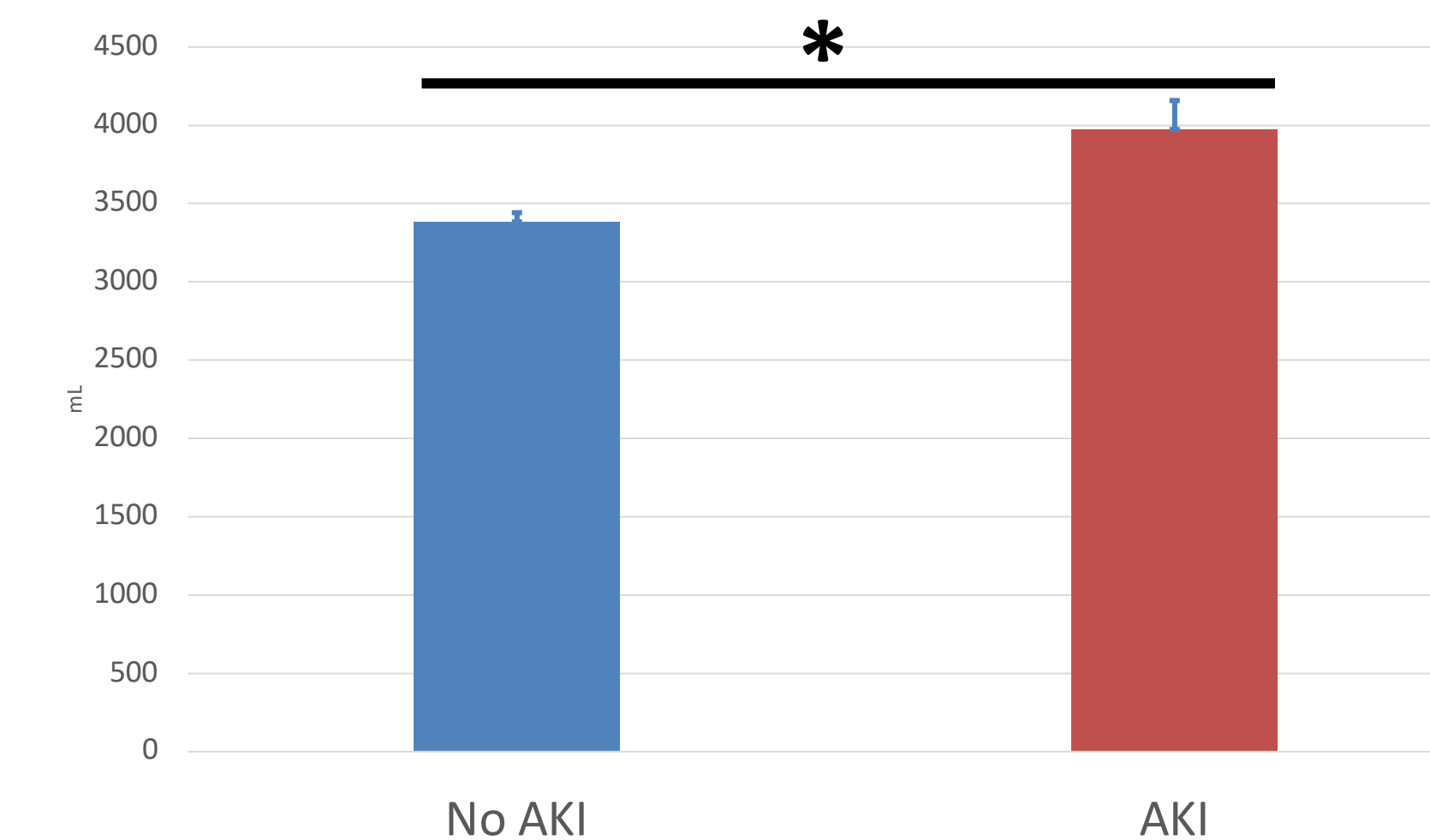
	No AKI N = 1280	AKI N = 214
Age Mean± SD (Mean difference -10.1)	43.5± 14.9	53.6 ± 16.6
Sex	667 males (53%)	140 Males (65%)
Diabetes	287 (22.9%)	97 (45.3%)
CHF	29 (2.3%)	14 (6.6%)
CKD	36 (2.9%)	34 (15.9%)
Cirrhosis	55 (4.4%)	28 (13.1%)
SIRS on presentation	331 (26.4%)	106 (49.5%)
ICU on admission	127 (10.1%)	71 (33.2%)

P value = < .001 for all comparisons in table 1

#### Management

- Patients with concomitant AKI received more fluids, with 3,974mL on average in the first 24 hours, with a mean difference of 590mL above the non-AKI cohort (p = .002).

**Figure 1.** Fluids given in the first 24 hours



**Table 2.** Fluid Management of Patients

	No AKI	AKI
Fluids given in first 24H Mean± SD (Mean Difference -590 mL)	3384 mL ± 2058	3974 mL ± 2687
Fluids given in second 24H Mean± SD (Mean difference -443mL)	2538 mL ± 2017	2981 mL ± 2361

#### Outcomes

- In a multivariate analysis, patients with concomitant AKI and AP were more likely to develop signs of volume overload including new pleural effusions and peripheral edema.
- They were also more likely to develop severe pancreatitis and had an increased length of stay of 4.7 days over the average 5.7 days (95% CI 1.67 – 7.8).

**Table 3.** Clinical outcomes

New pleural effusion OR (95% CI)	2.29 (1.26 – 4.15)
New peripheral edema OR (95% CI)	2.52 (1.02 – 6.21)
Severe Pancreatitis OR (95% CI)	8.7 (4.8 – 15.6)
Length of stay	4.74 days, p = .003
Additional days from mean 5.7 days	

### Conclusion

- Patients with concurrent AP and AKI tend to be managed with more aggressive fluid hydration.
- These patients have an elevated risk for adverse events including volume overload and are also at an increased risk for the development of severe pancreatitis.
- This highlights the challenges with defining a fluid management strategy in this population. More studies are needed to optimize the care of these patients.

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### References

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