



LONGER TIME TO RECOVERY FROM ACUTE KIDNEY INJURY IS ASSOCIATED WITH INCREASED MAJOR ADVERSE KIDNEY EVENTS IN PATIENTS WITH CIRRHOSIS

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INTRODUCTION

- In patients with cirrhosis, non-recovery from acute kidney injury (AKI) is associated with major adverse kidney events (MAKE).
- We aimed to examine the association between timing of recovery and risk of MAKE in patients with AKI recovery.

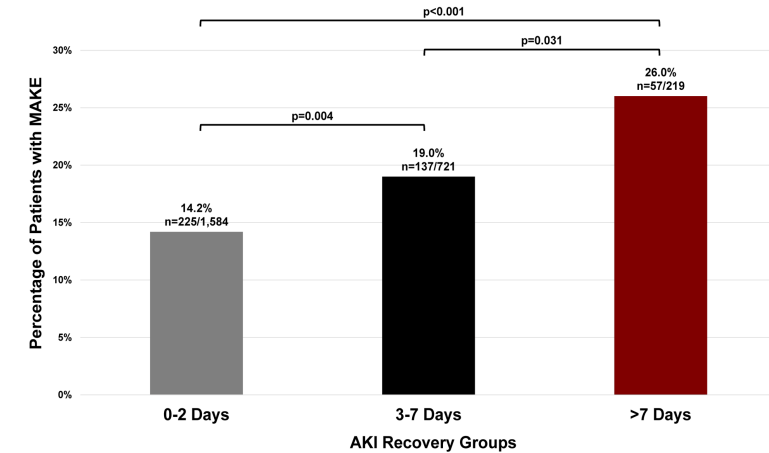
METHODS

- Hospitalized patients with cirrhosis and AKI (n=5,937) in a nationwide database were assessed for time to AKI-recovery and followed for 180-days.
- Timing of AKI-recovery (return of serum creatinine <0.3mg/dL of baseline) from AKI-onset was grouped by Acute Disease Quality Initiative Renal-Recovery consensus: 0-2, 3-7, and >7 days.
- The primary outcome was MAKE at 90 days.
- MAKE was defined as the composite outcome of ≥25% decline in estimated glomerular filtration rate (eGFR) compared with baseline with CKD stage ≥ 3 or progression of CKD or new hemodialysis or death.
- Competing risk multivariable analysis was performed to determine the independent association between timing of recovery and risk of MAKE.

RESULTS

Comparisons of Patient Characteristics Between AKI Recovery Groups

Variable	0-2 Days N=2,791	3-7 Days N=1,455	>7 Days N=409	P-value
Age	60 (52, 69)	62 (53, 71)	61 (53, 70)	<0.001
Race, n (%)				
White	1,994 (71.4)	1,039 (71.4)	278 (68.0)	0.020
Black	347 (12.5)	210 (14.4)	72 (17.6)	
Other	450 (16.1)	206 (14.2)	59 (14.4)	
Sex, male n (%)	1,699 (60.9)	861 (59.2)	245 (59.9)	0.925
Etiology of cirrhosis, n (%)				
Hepatitis C	475 (17.0)	256 (17.6)	76 (18.6)	0.034
Alcohol	809 (29.0)	355 (24.4)	92 (22.5)	
NASH	1027 (36.8)	578 (39.7)	169 (41.3)	
Other	140 (5.0)	87 (6.0)	25 (6.1)	
Unknown etiology	340 (12.2)	179 (12.3)	47 (11.5)	
Diabetes, n (%)	1,400 (50.2)	797 (54.8)	224 (54.8)	<0.001
Hypertension, n (%)	1,591 (57.0)	880 (60.5)	257 (62.8)	0.018
Baseline CKD, n (%)	656 (23.5)	498 (34.2)	186 (45.5)	<0.001
Baseline creatinine, mg/dL	0.9 (0.7, 1.4)	1.0 (0.7, 1.4)	1.10 (0.80, 1.75)	<0.001
Baseline eGFR, ml/min/1.73m ²	75.0 (45.4, 98.0)	70.1 (45.4, 98.0)	64.1 (36.1, 95.5)	<0.001
Laboratory at time of AKI				
WBC, 10 ³	9.0 (6.0, 13.0)	9.5 (6.4, 14.0)	9.7 (6.6, 13.7)	0.062
Sodium, mmol/L	135 (128, 139)	134 (126, 138)	133 (126, 138)	0.851
Creatinine, mg/dL	1.4 (1.1, 1.9)	1.8 (1.4, 2.7)	2.2 (1.6, 3.6)	<0.001
Albumin, g/dL	2.8 (2.3, 3.4)	2.7 (2.2, 3.3)	2.6 (2.1, 3.1)	<0.001
Total bilirubin, mg/dL	1.6 (0.8, 3.9)	2.0 (0.9, 4.1)	1.7 (0.8, 4.3)	0.002
INR	1.3 (1.1, 1.7)	1.4 (1.2, 1.8)	1.5 (1.2, 1.9)	<0.001
MELD-Na	20 (14, 26)	24 (19, 29)	26 (22, 30)	<0.001
Stage of AKI at diagnosis, n (%)				
1	2,430 (87.1)	1,005 (69.1)	254 (62.1)	<0.001
2	275 (9.8)	289 (19.9)	72 (17.6)	
3	86 (3.1)	161 (11.0)	83 (20.3)	
Infection	698 (25.0)	434 (29.8)	156 (38.1)	<0.001
ICU Admission	678 (24.3)	407 (28.0)	145 (35.5)	<0.001
Vasopressor	391 (14.0)	256 (17.6)	97 (23.7)	<0.001
Mechanical Ventilation	343 (12.3)	204 (14.0)	77 (18.8)	<0.001



- 4,655 (75%) achieved AKI-recovery: 0-2 (60%), 3-7 (31%), and >7 days (9%).
- On adjusted multivariable competing-risk analysis, compared to 0-2 days, recovery at 3-7 and >7 days was independently associated with an increased risk for MAKE: sHR 1.45 (95%CI 1.01-2.09, p=0.042), sHR 2.33 (95%CI 1.40-3.90, p=0.001), respectively.

CONCLUSIONS

- In patients with cirrhosis who recover from AKI, longer time to recovery is associated with an increased risk of major adverse kidney events.
- Interventions to hasten recovery from AKI should be considered in patients with cirrhosis who develop AKI.