KIDNEY INJURY MOLECULE-1 AND FRACTIONAL EXCRETION OF UREA IN ACUTE RENAL IMPAIRMENT IN HCV DECOMPENSATED CIRRHOSIS

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Introduction

Acute kidney injury (AKI) is a frequent and serious complication in cirrhosis, particularly in Egypt where HCV is a leading cause. Conventional markers like creatinine are unreliable in cirrhotic patientsdue to altered hepatic metabolism, muscle wasting, and the use of diuretics. This has highlighted the need for novel biomarkers that improve diagnostic accuracy and allow earlier detection of renal injury. Urinary kidney injury molecule-1 (KIM-1) and the fractional excretion of urea (FEUrea) have emerged as promising tools, but their performance in HCV-related cirrhosis remains underexplored.

Aim of the Work

This study aimed to evaluate the diagnostic performance of urinary KIM-1 and FEUrea in detecting and characterizing AKI in patients with HCV-related cirrhosis, and to assess their relationship with liver disease severity scores.

Patients and Methods

Eighty-five participants were studied: 35 cirrhotics with AKI, 35 without AKI, and 15 controls. Urinary KIM-1 was measured by ELISA, and FEUrea calculated from urine/serum urea. Liver disease severity was assessed by Child-Pugh, MELD, and MELD-Na scores. Biomarker levels were compared across groups, with ROC analysis for diagnostic accuracy and evaluation of AKI subtypes.

Results

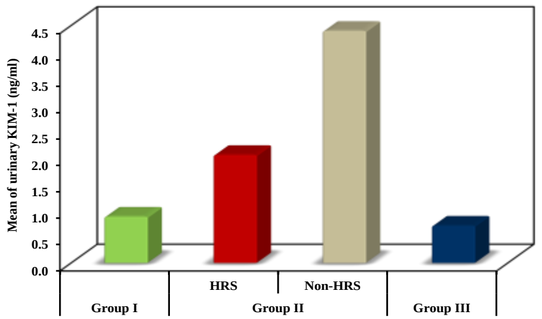

Figure 1: Comparison between the three studied groups according to Urinary KIM-1

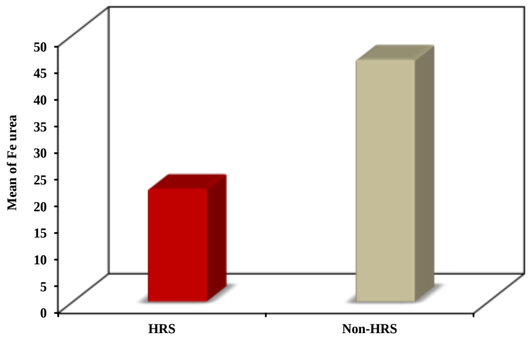

Figure 2: Comparison between the two studied groups according to Fe urea

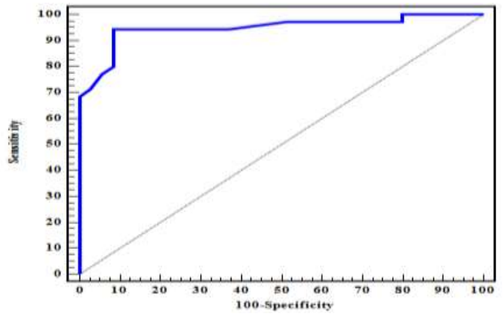

Figure 3: ROC curve for Urinary KIM-1 to discriminate Group II (n = 35) from Group I (n = 35)

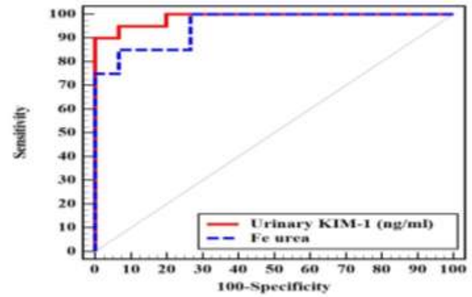

Figure 4: ROC curve for Urinary KIM-1 and Fe urea to discriminate HRS (n = 20) from Non-HRS (n = 15)

Table 1: Diagnostic performance for Urinary KIM-1 and Fe urea to discriminate HRS (n = 20) from Non-HRS (n = 15)

	AUC	P	95% C.I	Cut off#	Sensitivity	Specificity	PPV	NPV
Urinary KIM-1 (ng/ml)	0.987	<0.001*	0.960–1.000	≤3.76	95.0	80.0	86.4	92.3
Fe urea	0.953	<0.001*	0.892–1.000	≤29	80.0	93.33	94.1	77.8

AUC: Area Under a Curve p value: Probability value CI: Confidence Intervals
NPV: Negative predictive value PPV: Positive predictive value
*: Statistically significant at p ≤ 0.05 #Cut off was choose according to Youden index

Conclusion

Urinary KIM-1 showed high sensitivity and specificity for early AKI detection and accurately differentiated HRS from other AKI types. FEUrea also distinguished HRS from non-HRS but lacked prognostic value. Both markers required lower cutoffs than in previous reports, suggesting etiology-specific thresholds. Findings support their utility as diagnostic adjuncts in HCV-related cirrhosis, warranting larger studies.