



Urine Neutrophil Gelatinase-Associated Lipocalin (uNGAL) as an Early Biomarker in Diagnosis of Acute Kidney Injury in Cirrhotic Patients

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Background:

- The delayed diagnosis of acute kidney injury (AKI) by traditional markers in cirrhotic patients causes the undesired outcome.
- The potential of urine neutrophil gelatinase-associated lipocalin (uNGAL) which has been demonstrated as a novel early marker of AKI in various clinical setting has never been investigated in cirrhotic patients.
- This prospective cohort study was conducted to determine the accuracy of using uNGAL as a predictor for early identifying AKI in cirrhotic patients.

Methods:

- The hospitalized cirrhotic patients who had risk factors for developing AKI at the time of admission were enrolled.
- The urine samples were obtained immediately after admission and subsequently next 24 hours for uNGAL testing which was operated by chemiluminescent microparticle immunoassay technique (ARCHITECT® analyzer, Abbott Diagnostics, Abbott Park, IL, USA).
- Other clinical and laboratory parameters were prospectively assessed and followed up.
- The primary endpoint was the development of AKI by AKIN criteria within 48 hours.
- The secondary end point was the 30-day mortality.

Table 1 The sensitivity, specificity, PPV, NPV and accuracy of different cut-off values of uNGAL on admission in cirrhotic patients

Cutoff level of uNGAL (ng/ml)	sensitivity	specificity	PPV	NPV	Accuracy
46.2	95	70	54.5	97.7	79.2
65.7	84.2	81	60	94	82
150	68.4	96.6	86.7	90.3	89.6
190	47	97	81.8	84.8	84.4
259	42	100	100	84.1	85.7

Conclusion:

- The uNGAL is an excellent early biomarker for AKI in cirrhotic patients. The early AKI diagnosis by uNGAL might lead to the early effective treatments and improve the patient survival.

Results:

- 77 patients were enrolled, 24.7% of patients developed AKI within 48 h after enrollment. Child Turcotte Pugh A, B and C patients are 18.2%, 42.9% and 39% respectively.
- The mean uNGAL at enrollment was significantly higher in AKI group than non-AKI group (366.2 395.5 vs 40.3 47.6 ng/ml, p=0.002) while the serum Cr were comparable (1.06 0.32 vs 0.82 0.26 mg/dl, p=0.08).
- Using uNGAL level with cut-off 65.7 ng/mL, it could predict AKI with sensitivity and specificity of 84% and 81% as well as PPV and NPV of 60%, 94% and accuracy of 82%.
- The AUC-ROC of uNGAL for predicting AKI was 0.92 (95%CI; 0.86 to 0.98).
- The 30-day mortality was significantly higher in patients with high level of uNGAL than those with lower level of uNGAL (32.3% vs. 4.3%, p=0.001).
- Cirrhotic patients with prerenal AKI had lower uNGAL than those with renal AKI (86.8 54.1 vs 529.2 419.3ng/ml, p=0.014).

Fig. 1 The AUC-ROC of serum Cr and uNGAL in diagnosis of AKI

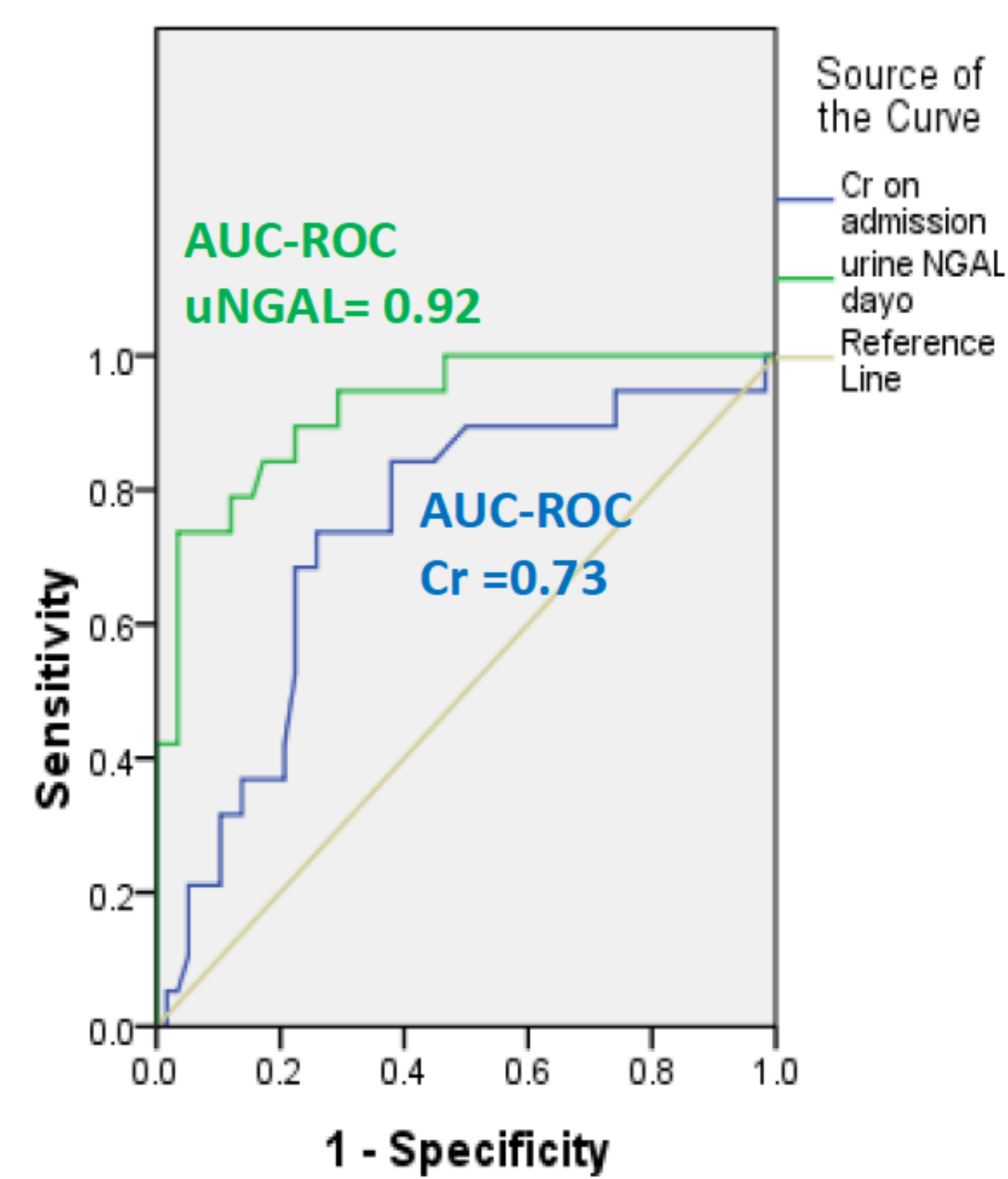


Fig.2 Difference values of uNGAL between cirrhotic patients with no AKI, prerenal and renal AKI

