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The Serum Neutrophil Gelatinase-Associated Lipocalin Predicts Early Acute Kidney Injury after Liver Transplantation

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ABSTRACT
Introduction: Acute kidney injury (AKI) following liver transplantation (LT) is a frequent complication and is associated with increased morbidity and mortality.
Aim: To investigate whether the levels of serum NGAL are able to predict early occurrence (within the first 48 hours) of the post-LT renal dysfunction.
Methods: The study was conducted on 50 recipients transplanted at the Fundeni Clinical Institute between May 2016 and June 2017. Serum NGAL and serum creatinine (sCr) were analyzed before LT, as well as 4 and 24 hours after graft reperfusion. In defining renal failure, the criteria of Kidney Disease Improving Global Outcome (KDIGO) were used. All patients received the same renal sparing regimen of immunosuppression.
Results: Twenty-four patients (48%) had early post-LT (<48 hours) renal dysfunction according to the KDIGO criteria. In the AKI group, there was a considerable increase in NGAL values at 4 hours after hepatic reperfusion in comparison with baseline values ($p<0.0001$), whereas in the group without AKI, the values of NGAL remained about the same ($p=0.18$). The single independent risk factor for early post-LT AKI occurrence was serum NGAL value 4 hours after hepatic reperfusion. The clinical utility of serum NGAL at 4 h after hepatic reperfusion for AKI prediction was excellent (AUROC 0.981, $p=0.0001$). Patients receiving a liver with a longer cold ischemia time (>6h) had a significantly higher NGAL serum levels at both 4 and 24h after reperfusion.
Conclusion: Early renal dysfunction following LT is frequent (48%) despite using a renal sparing immunosuppression regimen. Serum NGAL at 4 hours after hepatic reperfusion accurately predict AKI early, in the first 48 hours after LT.
Key words: biomarker, acute kidney injury, liver transplantation, Neutrophil gelatinase-associated lipocalin