

**Plasma neutrophil gelatinase-associated
lipocalin as an early diagnostic biomarker for
acute kidney injury following cardiac surgery**

**Thesis submitted in partial fulfillment for M.D. degree in
critical care medicine**

by

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Abstract

Introduction: Acute kidney injury is well recognized for its impact on the outcome of patients admitted to the intensive care unit (ICU) and The extent of perioperative renal impairment ranges from subclinical injury to established renal failure requiring dialysis.

The pursuit of improved biomarkers for the early diagnosis of AKI and its outcomes is an area of intense contemporary research, Recent studies have demonstrated the utility of early NGAL measurements for predicting clinical outcomes of AKI.

Methodology :our study was conducted on forty patients scheduled to have either on-pump or off-pump cardiac surgery during the period from February 2009 till June 2010, Spot plasma samples at (2 and 12 hours)intervals after cardiac surgery for measurement of plasma NGAL and serum creatinine) were obtained from all patients and RIFLE criteria were calculated at baseline and daily during the first five postoperative days taking in consideration Strict measures to avoid postoperative volume depletion and prerenal azotemia through using standard fluid regimen allowing all patients to receive at least 80%of their maintainance fluid requirements during the first 24 hours after surgery and 100% subsequently.

Results: Exploring the diagnostic yield of NGAL levels in our study , the development of acute kidney injury in our studied population was highly and significantly correlated to 2HNGAL level with P value (0.0001)and a mean 2HNGAL of 310 ± 65 in AKI patients compared to 140 ± 51 in non-AKI patients , also it was significantly correlated to 12HNGAL level with P value (0.02) and a mean 12HNGAL of 210 ± 103 in AKI patients compared to 147 ± 53 in non-AKI patients.also, Upon attempting to find out the best cutoff limits of both 2HNGAL and 12HNGAL as diagnostic markers of AKI using ROC curve analysis , it had been discovered that the best cutoff value for 2HNGAL was **169ng/ml that yields a sensitivity of 100% and a specificity of 80%**, on the other hand , the best cutoff value for 12HNGAL was **130ng/ml that yields a sensitivity of 80% and a specificity of 55%** .

Conclusion: NGAL measurement represents an early and reliable marker of AKI following cardiac surgery that could be in the future a therapeutic strategy modifying agent.

Key words : ICU , NGAL , AKI , RIFLE.

