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Neutrophil gelatinase-associated lipocain as a promising biomarker predictor for Acute Kidney Injuries : A Systematic and Meta-Diagnostic Analysis of Accuracy

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Objectives : Acute Kidney Injury (AKI) is a sudden kidney functionality reduction that is reversible. This seen as there were present of increased creatinine or decrease urine volume. Recent research has been emphasizing the constraints set by KDIGO (Kidney Disease: Improving Global Outcomes) in concluding AKI solely based on functional biomarkers. Neutrophil gelatinase-associated lipocain (NGAL) were shown to be more early to detect AKI, as they are associated with damage marker. To clear this controversy, this systematic and meta-diagnostic analysis was made to deduct whether NGAL were specific to predict and diagnosing AKI.
Methods : Systematic search was done by five author in several database such as PubMed, Science Direct, EBSCO, and Cochrane that published up to April 5th, 2015. We used Quality Assessment Tool for Diagnosis Accuracy Studies (QUADAS-2) to evaluate the quality of each study. Eligible studies will be extracted and compiled in tables to be analysed. Statistical analysis was performed using R Studio 2024.09.0+375 with "mada" code. This systematic and meta-diagnostic analysis followed a PICO framework, whereas "I" as the Index test.
Results : We included 17 studies with total of 7206 participants. AUCs for NGAL were 0.77 (95% CI, 0.73 – 0.79) , sensitivity and specificity analysis were done, we found that NGAL sensitivity was 0.84 (95% CI, 0.81 - 0.86) with specificity of 0.76 (95% CI, 0.71 - 0.81) . This systematic review and meta-diagnostic analysis showed s Pooled positive and negative likelihood ratio in NGAL were 3.62 (95% CI, 2.91 - 4.49) and 0.20 (95% CI, 0.16 - 0.25) respectively. DOR (diagnostic odds ratio) was 17.7 (95% CI, 12.1- 25.7).
Conclusions : This systematic review and meta-diagnostic analysis showed that NGAL may have been identified AKI earlier than other biomarker. However, as the data matures, further studies need to be done.

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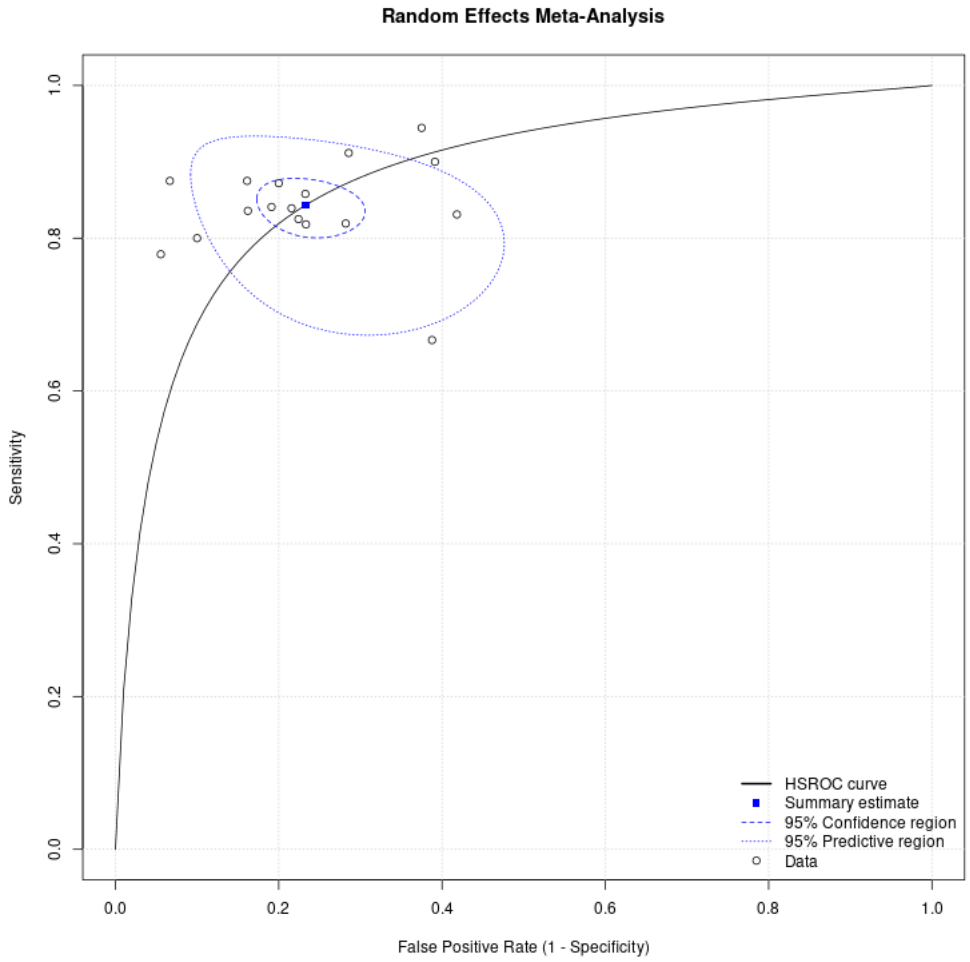
Beyond Challenges, Towards Healthier Kidney


Random Effects Meta-Analysis
Sensitivity
False Positive Rate (1 - Specificity)
0.0
0.2
0.4
0.6
0.8
1.0
HSROC curve
Summary estimate
95% Confidence region
95% Predictive region
Data

sroc (1).png

Forest plot of specificity