Validation of a novel point-of-care test for gut leakage in cirrhosis based on dimeric to monomeric IgA ratio: a pilot cohort study

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Background: Liver cirrhosis diagnosis is a critical step in liver disease management, yet challenging in low resource settings. Dimeric IgA to monomeric IgA ratio (dIgA ratio) is a potential biomarker of gut mucosal leakage in cirrhosis. We evaluated the diagnostic performance of a novel point-of-care (POC) dIgA ratio test for cirrhosis.

Methods: Stored plasma samples and matched clinical data from people with viral hepatitis were used in this cross-sectional pilot study. 5mcL of plasma was applied to the POC dIgA ratio test and read <20 minutes using the Axxin hand-held reader. Cirrhosis was defined as Fibroscan > 12.5kPa, clinical evidence of cirrhosis or liver biopsy. POC dIgA test diagnostic accuracy was determined in the Test cohort using logistic regression modelling and ROC analysis; optimal cutoffs for sensitivity and specificity were selected and then applied to POC dIgA measurement in the Validation cohort. Associations between dIgA ratio, cirrhosis and clinical parameters were determined by linear and logistic regression. APRI score could be calculated in a subset of individuals.

Results: 866 patients with chronic liver disease were included (260 Test cohort, 606 Validation cohort). 32% had cirrhosis in both cohorts. Median POC dIgA ratio was higher in cirrhosis at 0.9 (0.6, 1.4) compared with 0.4 (0.3, 0.5) in those without cirrhosis ($p<0.001$). In the Test cohort, POC dIgA ratio had good diagnostic accuracy for liver cirrhosis (AUROC 0.85, 95% CI 0.79-0.91); a 0.6 cutoff had sensitivity 74% and specificity 86%. In the Validation cohort, POC dIgA test accuracy for cirrhosis was moderate (AUROC 0.79, 95% CI 0.74-0.82; PPV 64%, NPV 83%), similar to APRI (sensitivity 55%, specificity 99%, PPV 90%, NPV 94%).

Conclusion: POC dIgA ratio test had moderate accuracy for cirrhosis, which was comparable to APRI. Further studies evaluating POC dIgA ratio test accuracy for liver cirrhosis screening are warranted.

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DA, JH and HV hold the patent for the POC dIgA ratio test.
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