

ROLE OF LIVER TRANSAMINASES AND FAST ULTRASOUND IN PREDICTING HEPATIC INJURY IN BLUNT TRAUMA PATIENTS

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INTRODUCTION

In blunt trauma patients, timely and accurate assessment of hepatic injury is critical for effective management and improved outcomes. Liver transaminases, specifically alanine aminotransferase (ALT) and aspartate aminotransferase (AST), are enzymes released into the bloodstream in response to hepatocyte damage, making them useful biomarkers for detecting liver injury. Elevated levels of these enzymes can indicate the extent of hepatic trauma, thus aiding in clinical decision-making.

FAST (Focused Assessment with Sonography for Trauma), is a non-invasive imaging technique widely used in emergency settings to rapidly identify free fluid, often a sign of internal bleeding, including from hepatic sources. The integration of liver transaminase measurements with FAST can enhance the sensitivity and specificity of diagnosing hepatic injuries, potentially reducing the need for more invasive diagnostic procedures. Understanding the combined role of these tools is essential for optimizing the management of patients with blunt abdominal trauma.

AIM OF THE WORK

The aim of the current study was to evaluate the accuracy of FAST and ALT for detection of hepatic injury after blunt abdominal trauma in adult abdominal trauma patients.

SUBJECTS AND METHODS

This study included patients with blunt abdominal trauma presented to the Emergency Department of Alexandria Main University Hospital. Sample size of 166 patients was needed to evaluate the diagnostic accuracy of abdominal Focused Assessment with Sonography for Trauma (FAST) and liver enzymes: ALT, and AST for detection of hepatic injury in patients with blunt abdominal trauma as compared to abdominal computed tomography.

RESULTS

In this study, 166 patients with blunt abdominal trauma were evaluated. The majority were male, in middle age. Common comorbidities included hypertension and diabetes mellitus. The statistical analysis revealed a significant association between elevated AST levels (cut-off ~140 IU/L) and hepatic injury in blunt trauma patients, with an Odds Ratio of 1.042 indicating a slight increase in injury risk with higher AST. AST demonstrated a sensitivity of 72% and specificity of 89.3%, with a Positive Predictive Value (PPV) of 85.4 and Negative Predictive Value (NPV) of 79.0, making it a reliable marker, especially for ruling out injury (Figure 1). Similarly, ALT, with a cut-off ~150 IU/L, showed a sensitivity of 78% and specificity of 92.3%, and a high area under the ROC curve, indicating its effectiveness in accurately diagnosing hepatic injury (Figure 2).

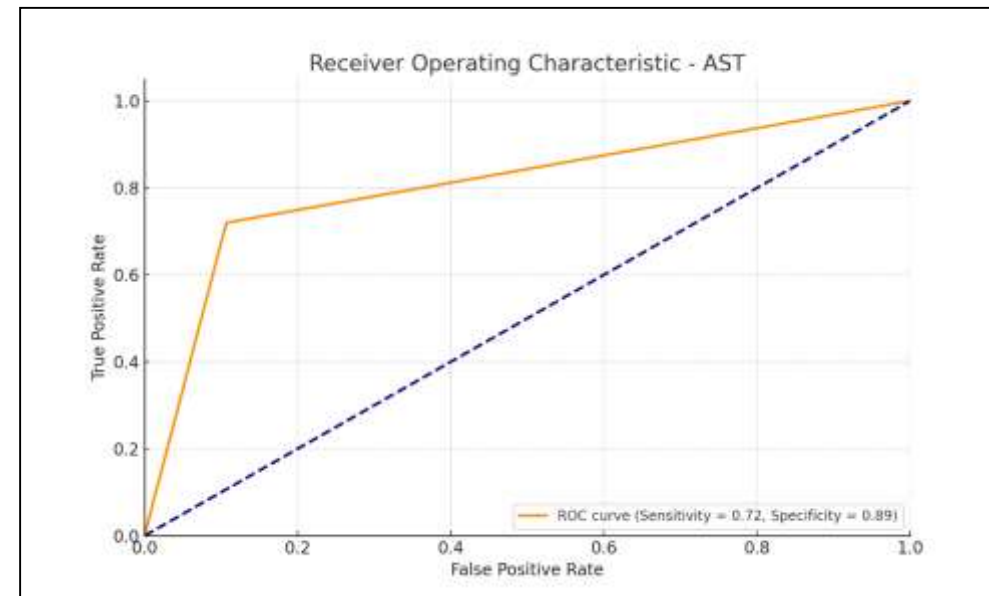


Figure 1: ROC Curve of AST in Detecting Hepatic Injury in Blunt Abdominal Trauma.

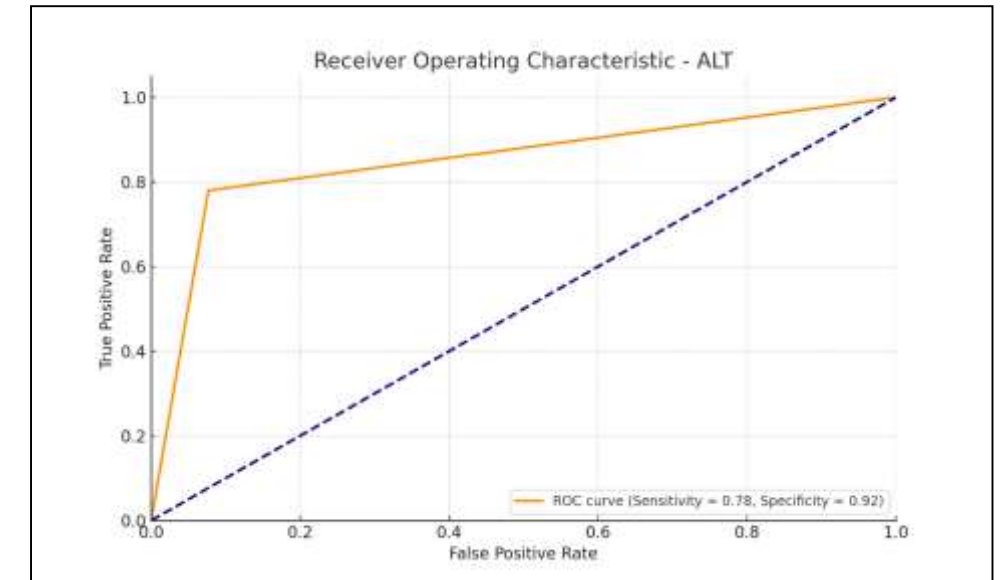


Figure 2: ROC Curve of ALT in Detecting Hepatic Injury in Blunt Abdominal Trauma.

CONCLUSION

The study assessed the effectiveness of AST, ALT, and FAST in diagnosing hepatic injury in blunt abdominal trauma patients, finding that while each test is valuable on its own, their combined use offers the most accurate assessment. AST and ALT showed moderate to high sensitivity and specificity, with ALT performing slightly better in detecting hepatic injuries. FAST provided a quick and effective initial evaluation. The combination of all three diagnostic tools resulted in a high sensitivity of 96%, enhancing the accuracy of hepatic injury detection and improving patient management. The study underscores the importance of an integrated diagnostic approach for better clinical outcomes.