



H117 The Value of Elevated Transaminases, Lipase, and Amylase in Children for Predicting Abdominal Injury After Blunt Abdominal Trauma: Is Laboratory Screening Valuable for Recognizing Physical Child Abuse? A Literature Review

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Learning Overview: After attending this presentation, attendees will understand the value of liver and pancreas enzyme analysis in screening cases of suspected physical child abuse.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing the evidence, or lack thereof, behind liver and pancreas enzyme analysis in screening cases of suspected physical child abuse.

Recognition of abdominal injuries after blunt abdominal trauma due to physical child abuse at the emergency department can be very difficult, as the clinical history and physical examination can be deceitful. In several studies, it has been suggested that laboratory screening is useful with respect to liver and pancreas trauma.

The goal of this systematic review is to examine the predictive value of transaminases, amylase, and lipase as a screening tool for abdominal injury in cases of suspected physical abuse.

With the help of a clinical librarian, a search strategy with a focus on the predictive value of different cut-off values of transaminases, amylase, and lipase in predicting abdominal injury or liver injury, confirmed by Computed Tomography (CT), Magnetic Resonance Imaging (MRI), autopsy, or surgical exploration, was designed. Using this strategy, literature was searched in MEDLINE® and EMBASE®. Inclusion criteria were studies in which the participants were children (0–18 years old) presenting at the hospital with suspected blunt abdominal trauma due to physical child abuse or other trauma mechanisms. Studies also had to mention a cut-off value for the laboratory studies. Exclusion criteria were studies in participants older than 18 years, studies relating to penetrating abdominal trauma, and articles written in a non-western language.

A three-stage on-line selection process was used for data extraction using Covidence. Out of 4,287 papers, 15 relevant studies were identified. Data were extracted, and quality assessment was conducted with the usage of QUADAS-2. All data were summarized in an overview table. In all articles, abdominal CT scan was either the only reference test or part of a subset of reference tests. Only in two articles was it reported that the radiologists were blinded for other information when interpreting the CT scan. In the other studies in which abdominal CT scan was part of a subset of reference tests, the other reference standards were also acknowledged gold standards for this research question.

There was a significant variation in reported cut-off levels and, thus, predictive value of transaminases, amylase, and lipase in children with blunt abdominal trauma. With respect to transaminases, it was shown that were significantly higher values in cases of more severe liver injury. This was in contrast to amylase and lipase in which neither initial nor peak levels were significant predictors of a specific grade of pancreatic injury.

Limitations of the literature search were the low number of articles concerning this topic that were useful for answering the research question. Furthermore, all but two articles were retrospective or observational prospectives with an inherent higher risk of bias due to case selection or selective exclusion.

Concluding, this systematic review showed a range of cut-off values used as a threshold in laboratory screening tools for blunt abdominal trauma in children, suspected of physical child abuse, who present at the emergency department. A prospective multicenter study is needed to validate appropriate cut-off values for transaminases, amylase, and lipase. Within these, the study designs should also pay attention to the risk of radiation exposure, cost-effectiveness, timing of laboratory screening, and implementation in daily clinical practice.

Child Abuse, Abdominal Trauma, Screening