Original Article

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Early Predictive Value of Different Indicators for Persistent Organ Failure in Acute Pancreatitis A Systematic Review and Network Meta-Analysis

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ABSTRACT

We performed a network meta-analysis (based on the ANOVA model) in this study to assess each early predictor's predictive power.

Context : One of the risk factors for patients with acute pancreatitis is persistent organ failure (POF); however, POF diagnosis often delayed (more than 48 hours). It has significant clinical implications for the noninvasive early POF prediction.

Study : To find pertinent clinical trials, case-control studies, or cohort studies, we carried out a thorough and methodical search in PubMed, Cochrane library, Embase, and Web of Science. We then extracted the early indicators of POF from the studies and used network meta-analysis to summarize the predictive efficacy of each indicator. The predictive efficacy of every signal was ranked using the diagnostic odds ratio (DOR).

H.W : Original draft writing, writing—review and editing, validation, conceptualization, technique, software, and writing. M.L.: Research, data curation, resources, initial draft writing, and writing—review & editing. W.L.: Writing—original draft, writing—review, writing—editing, and supervision. J.S.: Writing—original draft; conceptualization; formal analysis; obtaining funds; project administration. L.P.: Original draft writing, writing—review and editing, formal analysis, financing acquisition, project administration, and conceptualization.

Keywords

Acute pancreatitis, persistent organ failure, early prediction, network meta-analysis.

INTRODUCTION

Acute pancreatitis (AP) is a pancreatic inflammatory illness. With a global total annual incidence of AP of 33.74 cases per 100,000 general population (95% CI: 23.33–48.81), it is the main cause of hospitalization for gastrointestinal illnesses globally.1,2 The disease primarily afflicted middle-aged or older persons, with no statistically significant difference between males and females.3,4 Depending on the degree of systemic damage to distal organs and, more crucially, the local damage in and around the pancreas, AP is categorized as mild, moderately severe, or severe.5. Local or systemic inflammatory complications are frequently associated with moderate to severe AP and increase the risk of systemic organ dysfunction and subsequent organ failure (OF).Six The prevalence of OF, however, differs greatly among the documented AP patients, mostly as a result of variations in early diagnosis and care.

Depending on how long their OF lasted, AP patients with POF were categorized as either persistent or transitory organ failure. Transient organ failure was classified as ≤ 48 hours, while POF was characterized as lasting > 48 hours.Six For nearly all AP patients, OF is the cause of death. Given that the fatality brought on by OF nearly accounts for the mortality of all AP patients, the transitory OF mortality ranges from 1.4% to 10%, and the total POF mortality is greater than 40%.7. In the first two weeks, patients with POF are at a high risk of passing away.Six But as its definition makes clear, it is unfortunate that the diagnosis of POF is delayed.

RESOURCES AND TECHNIQUES

Literature Finder:

A thorough search of published research on pancreatitis exacerbated by POF was carried out. We conducted searches from each database's launch date until September 29, 2021, including PubMed, Embase, Cochrane Library, and Web of Science. It was decided to combine theme words (called Mesh in PubMed) with keywords (called Entry terms in PubMed). these were the search tactics used for PubMed: (Disease of

the organs) AND ((AP [Title/Abstract])

Criteria for Inclusion and Exclusion

The following were included as inclusion criteria: (1) Patients with AP and POF diagnoses were well specified; (2) adequate details regarding the diagnostic utility of one or more assessment markers for POF were provided; (3) reports were made in English; and (4) there were no limitations based on gender, age, or geographic location.

Among the exclusion criteria were the following: Literature written in languages other than English;(2) redundant and unrelated literature;(3) a work that is only abstract; and(4) a lack of true positives (TP), false positives (FP), false negatives (FN), or true negatives (TN)

Evaluation of Quality

The methodological quality of the included studies was independently evaluated by two researchers (H.W. and W.L.) utilizing quality evaluation of diagnostic accuracy studies-2–2.12 Arguments were used to settle disagreements in the quality evaluations.

A third independent researcher (M.L.) will participate if needed to render a final decision. Four essential components make up Quadas-2: a summary of the review question, modification of the tool and creation of guidelines unique to reviews, creation of a flow diagram for the original study, and assessment of bias and applicability.

CONCLUSION

This network meta-analysis's main contribution is to provide an overview of POF's early diagnostic markers and effectiveness in AP patients. According to our research, the ALB, HDL, Ranson, and BISAP scores are useful in the early POF prediction in AP patients, which can show how to create efficient early POF prediction systems (such machine learning-based prediction models). However, certain useful indications might not be included in this meta-analysis because of the shortcomings in the predictive indicator extraction technique used in this work.

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