



How to predict the severity of acute pancreatitis? An ongoing debate

Dear Editor,

We read the article entitled "Early prediction of organ failure under the revised Atlanta classification" with great interest (1). Prediction of the severity of acute pancreatitis is a highly attractive issue, which is important for determining early triage, aggressive resuscitation of the patient, and the need to refer to an intensive care unit. The authors conducted a retrospective study among 214 patients with acute pancreatitis in order to determine conventional laboratory tests and scoring systems that could predict the development of organ failure at an early stage.

The authors found that among all laboratory tests, determination of serum calcium, arterial partial pressure of oxygen (PaO₂), and base excess levels had the highest predictive value. However, the positive predictive values of these tests were low (between 22.2% and 40%). At the same time, the authors found that compared with APACHE II and BISAP scores, the extrapancreatic inflammation on computed tomography (EPIC) score had the highest accuracy (AUROC: 0.82). However, the positive predictive value of the EPIC score was 36%, which is much more important than that of ROC curve analysis in clinical decision making. On the other hand, the APACHE II score had a higher PPV (80%) and a sensitivity of 12.5%, which was significantly lower than that reported in the literature. We think that this may be due to the exclusion of cases that developed organ failure before admission to the hospital. In addition, the authors calculated BISAP and APACHE II scores only on the basis of data obtained within 24 hours of hospital admission. It is well known that the APACHE II score has a poor predictive value at 24 hours. In other words, it has a high false-positive rate. However, increasing levels during the first 48 hours is more useful and can predict a severe disease. With regard to other laboratory tests, we wonder why the authors did not consider hematocrit levels.

The authors calculated the EPIC score by performing a CT scan before or on the same day of organ failure diagnosis. They found that the EPIC score had 73.6% specificity. However, PPV of the EPIC score was 36%. In a previous report, the EPIC score was found to be a better

predictor of outcome than CTSI and Balthazar scores. However, a CT scan was performed at least 3 days after the onset of symptoms (2). Morphological changes and organ failure are not directly proportional. The development of organ failure depends on the individual's response to the initial insult. At the same time, it is well known that optimal timing for initial CT is at least 72 hours after the onset of symptoms (3). An earlier CT may miss or underestimate the necrosis. Furthermore, an early CT does not change the management of the patient and improve the clinical outcome. Therefore, patients may need to undergo a second CT scan depending on their clinical course. Do the authors suggest that an early CT is practical in this regard? Is it recommended to perform a CT scan in an asymptomatic patient? The authors found no significant difference between the laboratory markers and scoring systems of patients with transient and persistent organ failure. We wonder about the details regarding their fluid resuscitation protocol and whether the transient and persistent organ failure groups were similar in this regard.

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Author's Reply

Dear Köksal,

Thank you for your letter. You must be devoted to the research of acute pancreatitis for a long time, and your question is interesting and worthy to consider deeply.

We also found the positive predictive values of serum calcium, PaO₂, base excess levels, BISAP and APACHE II scores, and EPIC score were low. The reason might be the study design itself. This study aimed to assess and compare the ability of laboratory markers and scoring systems to early predict organ failure. In order to make sure "early prediction", we made up strictly "Exclusion criteria". When collecting data, all laboratory tests were conducted in the emergency room prior to admission or within 24 hours after admission, and APACHE II and BISAP scores were calculated using data obtained within the first 24 hours. Perhaps this was the reason why most positive predictive values were low. When referring to APACHE II, there was another reason. The cutoff value of APACHE II (≥ 8) was previously determined at data collecting stage, which might be too big in this patient series.

The predicting value also including specificity and negative predictive value, and you will find most specificity and negative predicting values were encouraging. In our study, serum calcium, PaO₂, and base excess were independent predicting values, so we concluded that they had the highest predictive value, although the predicting accuracy was not high.

We try to analyze the predict value of hematocrit level in this study according to your advise, and there was no statistically difference between patients with and without organ failure (41.8% vs 40.6%).

In this study, most CT scans were done in order to assist the diagnosis of acute pancreatitis and assess biliary tract. If necrosis was suspected, another CT scan was often done one week after onset. We don't recommend all patients accepting CT scan on admission. However, if there's an unclear diagnosis, for example asymptomatic patient with the rising of serum amylase, CT scan is recommended.

We didn't record fluid resuscitation protocol in this study, but we thought fluid resuscitation protocols in transient and persistent organ failure groups were similar theoretically, because nobody could exactly predict the during time of organ failure when it happened, and doctors had no choice except giving similar treatments.

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