Correspondence on Editorial regarding “Dynamic Assessment of Modified Quick Sequential Organ Failure Assessment in Acutely Deteriorated Patients with Chronic Liver Disease”

Running title: m-qSOFA in acutely deteriorated CLD patients

Do Seon Song,1 Dong Joon Kim2

1Department of Internal Medicine, St. Vincent’s Hospital, The Catholic University of Korea, Seoul, Korea

2Department of Internal Medicine, Hallym University College of Medicine, Chuncheon, Korea

Correspondence:

Dong Joon Kim, MD, PhD

Department of Internal Medicine, Hallym University College of Medicine, 24252, Chuncheon, South Korea

Tel: +82 33 240 5646; Fax: +82 33 241 8064; E-mail: djkim@hallym.ac.kr

Key words: qSOFA; Acute-on-Chronic Liver Failure, Systemic inflammation
Dear Editor,

We would like to thank Dr. Inccico and Dr. Piano for their interests and comments on our paper. In the Editorials, the authors raised three issues. First, the modified quick Sequential Organ Failure Assessment (m-qSOFA) score has low sensitivity and a low discrimination ability for the prediction of 1-month mortality when used alone. Second, both the Korean Acute-on-Chronic Liver Failure (KACLiF) and Asian Pacific Association for the Study of the Liver Acute-on-Chronic Liver Failure Research Consortium (AARC) cohorts in which the m-qSOFA score was analyzed are Asian cohorts, and more than two-thirds of the patients in each cohort have alcohol-related liver disease. Third, it is necessary to evaluate systemic inflammatory markers.

We agree that the m-qSOFA score has low sensitivity and low discrimination ability for predicting 1-month mortality in patients with acutely deteriorated chronic liver disease (CLD). The qSOFA score was developed to screen high-risk patients within a population suspected of having an infection. However, the qSOFA score has demonstrated low sensitivity in identifying high-risk patients both in the general population and among those with cirrhosis, and it is not recommended to be used alone to screen for sepsis or septic shock. In our study, compared with other CLD-specific prognostic scores, the m-qSOFA score alone had a significantly lower area under the receiver operating characteristic curve (AUROC) value for predicting 1-month mortality. Since the m-qSOFA is based on only three variables, it is not surprising that it has less power than scores based on more variables. Therefore, the m-qSOFA score should be used in combination with acute-on-chronic liver failure (ACLF) or other scoring systems rather than being used alone. Moreover, not only the m-qSOFA score at baseline but also its dynamic change on day 7 helped to identify high-risk patients. In fact, in our study, the m-qSOFA score at baseline and at 7 days improved risk stratification when evaluated with the AARC ACLF or MELD score. With the advantage of not requiring computation and being readily available at the bedside, the m-qSOFA score, in combination with other liver-specific prognostic scores, will aid in identifying high-risk patients.

We also agree with the second issue that our study analyzed alcohol-related liver disease-predominant populations in Asia. Acutely decompensated liver disease and ACLF encompass a group of conditions with diverse etiologies and precipitants. Since approximately two-thirds of the patients in the KACLiF and AARC cohorts had alcohol-related liver disease, the efficacy of the m-qSOFA score may vary with respect to other etiologies or with respect to populations with different predominant precipitants. Therefore, it is necessary to validate the m-qSOFA score in diverse groups. Additionally, the score should be validated in cohorts from different regions, such as the European Association for the Study of Liver-Chronic Liver Failure (EASL-CLIF) or North American Consortium
for the Study of End-stage Liver Disease (NACSELD) cohort, to account for potential ethnic differences. Validation in diverse patient populations could also contribute to the development of unified ACLF criteria.

In patients with acutely decompensated CLD, systemic inflammation plays a crucial role in the progression to ACLF.\(^7,8\) The AARC defines the ‘golden window’ as the one-week period of systemic inflammatory response preceding sepsis or extrahepatic organ failure and recommends intervention during this time.\(^9\) C-reactive protein (CRP) and the leukocyte count are well-known systemic inflammatory markers. In our study, the high m-qSOFA group exhibited significantly elevated white blood cell (WBC) counts, absolute neutrophil counts (ANCs), and CRP levels than did the low m-qSOFA group. According to multivariate analysis, the WBC count was identified as an independent predictor of 1-month transplant-free survival (TFS) in the AARC cohort but not in the KACLIF cohort. We analyzed the prognostic impact of systemic inflammatory markers by categorizing patients into high and low m-qSOFA groups in KACLIF cohort. In the low m-qSOFA group, the high leukocyte, high CRP, and systemic inflammatory response syndrome-positive groups exhibited significantly lower 1-month TFS (\(P=0.001\), \(P<0.001\), and \(P=0.033\), respectively), whereas no significant differences were observed in the high m-qSOFA group (all Ps > 0.05) (Figure 1). These results suggest that systemic inflammation has a greater impact on less severe disease, while its influence diminishes as the disease stage advances. However, in patients with advanced liver disease, systemic inflammatory markers can be influenced by liver dysfunction, necessitating cautious interpretation.\(^10\)

In summary, when used alone, the m-qSOFA score has low sensitivity and predictive power for short-term outcomes compared to other scoring systems. Therefore, it should be utilized in conjunction with ACLF or other scoring systems to increase the risk stratification ability. The m-qSOFA score should be validated across diverse ethnic and patient populations. Future studies should analyze the role of systemic inflammation and the m-qSOFA score in patients with advanced CLD by examining systemic inflammatory markers.
References


Figure legends

Figure 1. Systemic inflammation and the modified qSOFA score among patients with acutely decompensated chronic liver disease. (A), (C), and (E), low m-qSOFA group and (B), (D), and (F) high m-qSOFA group.