Modified quick-SOFA score: can it enhance prognostic assessment for hospitalized patients with chronic liver diseases?

Authors
Simone Incicco¹, MD; Salvatore Piano¹, MD, PhD.

Affiliations
Unit of Internal Medicine and Hepatology (UIMH), Department of Medicine (DIMED), University of Padova, Italy.

Correspondence to: Salvatore Piano, MD, PhD; Unit of Internal Medicine and Hepatology, Department of Medicine (DIMED), University Hospital of Padova, Via Giustiniani 2; Padova 35100, Italy; E-mail: salvatorepiano@gmail.com; Tel: +39/0498212265

Disclosure statement
The authors have nothing to disclose regarding the work under consideration for publication.

Authors’ contribution
SI and SP reviewed the literature and drafted the manuscript.

Word count: 944
References count: 16.
The prognostic stratification is crucial for guiding management of patients with acute decompensation of chronic liver diseases. The presence of organ dysfunctions/failures has a relevant impact in defining Acute on Chronic Liver Failure (ACLF) and predicting prognosis[1]. Organ dysfunctions and failures can be defined using a modified Sequential Organ Failure Assessment (SOFA) score, the Chronic Liver Failure-SOFA (CLIF-SOFA) or CLIF Consortium Organ Failure (CLIF-C OFs) score, which have shown strong prognostic ability[1,2]. More recently, the APASL ACLF Research Consortium (AARC) developed a new score, the AARC score, including total bilirubin, hepatic encephalopathy (HE) grade, international normalized ratio, lactate levels and creatinine[3]. However, all these scores require laboratory tests and are not suitable for repeated assessment at patient's bedside. In 2016, in the setting of the Third International Consensus Conference on the Definitions of Sepsis and Septic Shock (Sepsis-3), a new bedside score was introduced to identify adult patients with known or suspected infection at higher risk of poor outcomes, the quick SOFA (qSOFA)[4]. The qSOFA is considered positive when at least two among the following clinical criteria are present: alteration of consciousness, defined as Glasgow Coma Scale (GCS) < 15; systolic blood pressure of 100 mmHg or less; respiratory rate > 22 breaths/minute[4]. Although less robust than Sepsis-3 criteria in intensive care settings[5], the qSOFA does not require laboratory tests and can be assessed quickly and repeatedly. The qSOFA showed good prognostic ability in patients with cirrhosis and bacterial infections as it has proven to be an independent predictor of in-hospital and 28-day mortality[6,7]. Furthermore, in patients initially classified as low risk (qSOFA < 2), repeated assessment of qSOFA at day 3 of hospitalization further refined prediction of short term mortality (30-day survival probability of 88% in subjects with qSOFA < 2 and only 24% among those with qSOFA > 2)[7]. On the other hand, studies involving patients with decompensated cirrhosis without bacterial infections have yielded controversial findings challenging the utility of qSOFA score in predicting short-term outcomes[8,9].

In this issue of Clinical and Molecular Hepatology, Song and colleagues investigated the usefulness of a modified version of the qSOFA score in predicting short-term survival in two large cohorts of patients with acutely decompensated chronic liver disease and ACLF from Korean Acute-on-Chronic Liver Failure (KACLiF) study and AARC database[10]. In order to capture more accurately specific features of cerebral dysfunction in patients with liver cirrhosis, the authors developed the modified qSOFA (m-qSOFA) by replacing GCS with West Haven criteria for HE and used HE grade ≥ 2, the criterion for overt HE, to evaluate altered mental status[10]. They found that high m-qSOFA (> 2) at baseline was an
independent predictor of 1-month transplant-free survival (TFS), even after adjusting for disease-specific prognostic scores (Child-Pugh, Model for End Stage Liver Disease [MELD] and MELD-Na scores) and that patients with high baseline m-qSOFA had higher rates of new organ failure development than patients with low m-qSOFA (< 2)[10]. Furthermore, authors assessed prognostic relevance of dynamic changes of m-qSOFA: they found that patients whose m-qSOFA turned from low to high at 7 days had significantly lower 1-month TFS compared to those whose m-qSOFA turned from high to low, regardless of MELD and MELD-Na scores, and experienced the highest rate of new organ failure development[10]. Finally, subgroup analysis showed that baseline m-qSOFA and its dynamic assessment were able to improve prognostic stratification of patients with ACLF according to both EASL-CLIF Consortium and AARC definitions. Among patients with ACLF, those with high m-qSOFA at baseline and at day 7 experienced the highest risk of short-term mortality[10]. According to these findings, the authors conclude that m-qSOFA and its repeated assessment could represent a useful prognostic tool in patients with acute decompensation of chronic liver disease.

This results however should be interpreted with caution. In both study cohorts, patients with high m-qSOFA at baseline were a minority (8.1% in KACLiF cohort and 19.3% in AARC cohort, respectively) and accounted for approximately 30% of the patients who died or underwent transplantation within one month. Therefore m-qSOFA has high specificity, but low sensitivity in predicting short-term outcomes in patients with acute decompensation of chronic liver disease. This statement is consistent with results of recent studies showing low sensitivity of qSOFA in the general population[11–13], which has led to the recommendation against using qSOFA alone as a screening tool for sepsis and septic shock[14]. Not surprisingly, the discrimination ability of the m-qSOFA in predicting 1-month mortality was significantly lower compared to other disease-specific scoring systems, with an area under the receiver operating characteristics curve below 0.70 both at baseline and at 7 days. Consequently, the m-qSOFA should not be used alone but integrated with other prognostic scores. On the other hand, the mqSOFA has the advantage of being an extremely simple scoring system that does not require laboratory tests and can be easily repeatable at the bedside. Another note of caution is that the two studied cohorts include patients coming from a single geographical area and predominantly with alcohol-related liver disease, thus limiting the generalizability of the results. Therefore, these findings need to be validated in cohorts of patients from other geographical area and with different etiologies of liver disease. Finally, biomarkers of systemic inflammation, which have been extensively
correlated with mortality risk in patients with acute decompensation of cirrhosis and ACLF[1,15,16], have not been thoroughly assessed in the present study.

In summary, the m-qSOFA represents a simple bedside score that can be added to the toolkit of clinicians caring for patients with liver disease. However, it should be integrated with other robust scores and should not be used alone in the prediction of short-term outcomes in patients with acute decompensation of chronic liver disease.
REFERENCES


