

LETTER

Shock index: blunt clinical predictions

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See related research by Mutschler *et al.*, <http://ccforum.com/content/17/4/R172>

We appreciate the work of Mutschler and colleagues regarding shock index (SI) in trauma patients [1]; however, we would like to discuss a few points of interest. The SI obtained at the scene differed from the SI obtained in the emergency department (ED). Patients with SI category III had a SI at the scene of 0.7 to 1.5. This indicates that SI can vary with time and vary with changes in medical condition. Patients classified as 'no shock' still had a 10.9% mortality rate, a 12.5% risk of multi-organ failure, and a 6.3% risk of sepsis. We do not know when the onset of sepsis occurred in these trauma patients. Thus, a single SI taken within 'the first hours' of ED admission might not accurately reflect a patient's condition, especially if the initial SI is category I or II.

Other studies have shown that SI may also lead to an undertriage of those patients most likely to develop early and progressive hemorrhagic shock [2]. In addition, prehospital SI alone was found to have diminished accuracy for patients aged over 60 years [3]. SI may be of limited value in the assessment of systemic oxygen transport [4], which is a more direct measurement of end-organ perfusion and tissue viability than the SI. Finally, the results of this study can best be applied to male patients with blunt trauma injuries who develop hypovolemic shock, but not to every trauma patient on presentation to ED with high risk of other types of shock.

Authors' response

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Li and colleagues note that SI may vary with time and changing medical condition; therefore, a single SI may not accurately reflect a patient's condition. We fully agree that a single SI represents only a 'snapshot' depending partly on actual treatment. However, previous independent reports have demonstrated that SI correlated best with the transfusion of ≥ 4 blood units within the first 48 hours after hospital admission [5,6] and that patients with a SI between 0.7 and 0.9 had a two-fold increased risk for massive transfusion [7]. Li and colleagues further criticize that SI may lead to an undertriage of patients and cite a corresponding study [2]. In this study, however, the low sensitivity of the SI was observed only in healthy individuals with low tolerance to artificial progressive lower-body negative-

pressure. The mortality and multi-organ failure/sepsis rates in our 'no shock' group may be attributable to initial trauma load (Injury Severity Score group I 19.3 (± 12.0)), including relevant (Abbreviated Injury Scale ≥ 3) brain (45.9%) and thoracic injuries (36.1%). Lastly, Li and colleagues criticize that SI may not be accurate in the elderly. The cited study, however, suggests that the number of blood products transfused in patients aged between 16 and 80 years correlates significantly with the SI [3]. The authors acknowledge that SI is inferior to direct perfusion measurements and should not be used inconsiderately in clinical routine. However, SI may serve as a fast and easy alternative to assess the extent of hypovolemia in trauma patients when advanced technology is unavailable.

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Abbreviations

ED: Emergency Department; SI: Shock index.

Competing interests

The authors declare that they have no competing interests.

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