

Association of critical illness scores (q-SOFA and APACHE) and multimorbidity in patients admitted to internal medicine step down units

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Introduction

A large number of patients worldwide have multimorbidity (two or more chronic diseases). In the past few decades, the prevalence of multimorbidity has been rising steeply and managing such patients is a challenge.¹ The majority of these patients are admitted to step down units or SDUs (rather than intensive care units). Mortality among these patients is around 10%, so it is important to assess the severity of illness to guide prognosis. There are various scoring systems developed in this context to calculate the severity of illness.² These scoring systems aim to help physicians estimate disease severity, identify possible outcomes and prepare them for the appropriate management.³ We aimed to determine the level of illness by using two different scoring systems: the quick Sequential Organ Failure Assessment Score (q-SOFA) and Acute Physiology and Chronic Health Evaluation (APACHE).

Methods

We carried out a cross-sectional analytical study which included adult patients aged >18 years admitted to SDUs at the Aga Khan Hospital in 2016. Data were acquired for a sample of 1,191/3,500 patient records, and data for 1,002/1,191 patients were included in the study. Data on demographics, comorbid conditions, admitting diagnosis, laboratory investigations, mortality and readmission to SCU from the ward/emergency room was recorded. APACHE II was used, comprising 12 physiological variables, age and chronic health evaluation. Q-SOFA utilises blood pressure, respiratory rate and the Glasgow Coma Scale (GCS) to calculate the severity of critical illness.

Results

The study included 1,002 patients with a mean (standard deviation (SD)) age of 62.2 (16.5) years; 493 (49.2%) were men and 923 (92.1%) were full-code (ie they had given permission for resuscitation, intubation and ventilator support). These 1,002 patients had major comorbidities and included 549

Table 1. Top five admitting diagnoses in 2016 in the internal medicine step down unit with their mean scores

Diagnosis	n=1,002 (%)	q-SOFA Mean±SD	APACHE II Mean±SD
Acute kidney injury or chronic kidney disease	399 (39.8%)	1.8±0.6	14.7±4.8
Pneumonia	291 (29.0%)	1.8±0.6	12.7±5.1
Urinary tract infection	211 (21.1%)	1.8±0.6	13.4±5.1
Pulmonary oedema / heart failure	171 (17.1%)	1.7±0.6	14.2±5.2
Sepsis / septic shock	159 (15.9%)	1.9±0.6	13.6±5.2

q-SOFA = quick Sequential Organ Failure Assessment Score; APACHE = Acute Physiology and Chronic Health Evaluation.

(54.8%) with diabetes, 708 (70.7%) with hypertension, 282 (28.3%) with ischaemic heart disease (IHD), 109 (10.9%) with chronic obstructive pulmonary disease (COPD) / asthma and 263 (26.2%) with chronic kidney disease.

Multimorbidity was found in 888 patients (88.8%). Comparison of q-SOFA with multimorbidity showed a mean score of 1.8 with SD of 0.6 in multimorbid patients, with a mean score of 1.8 with

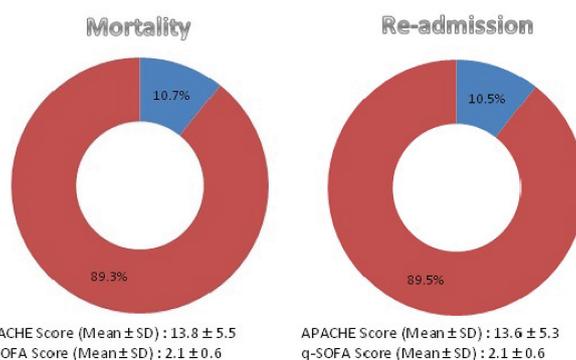


Fig 1. Mortality and readmission scores using APACHE and q-SOFA.

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SD of 0.6 in non-multimorbid patients ($p=0.940$). Comparisons of APACHE II with multimorbidity showed a mean score of 13.1 with SD of 5.1 in multimorbid patients, with a mean score of 7.4 with SD of 4.7 in non-multimorbid patients (p -value 0.000). See Table 1 and Fig 1.

Conclusion

APACHE had a direct association with multimorbidity when compared with q-SOFA. Patients with multimorbidity had a high APACHE score, indicating that they were at higher risk of mortality. We conclude that APACHE is a better predictor of illness in patients admitted to SDUs. ■

Conflicts of interest

None declared.

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