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Original Research

Comparative Assessment of CURB-65 and qSOFA Scores in Predicting Clinical Outcomes Among Hospitalized Patients with Community-Acquired Pneumonia.

Dr. Abhaykiran P.[1]*, Dr. Sowmyashree P.[2], Dr. Sunitha[3]
1Assistant Professor, Department of General Medicine, CIMS, Chamarajanagar, India.
2Specialist Medical Officer, Department of Peadiatrics, Subdivision Hospital Kollegal, India.
3Specialist Medical Officer, Department of ENT, Subdivision Hospital Kollegal, India.

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Abstract
Background: Community-acquired pneumonia is an important cause of hospitalization, respiratory failure, sepsis and mortality. CURB-65 is a pneumonia-specific severity score, whereas qSOFA is a rapid bedside tool for identifying patients with infection at increased risk of adverse outcomes. Direct comparison of these scores may help determine their relative usefulness in hospitalized patients with community-acquired pneumonia. *Aim:* To compare the prognostic performance of CURB-65 and qSOFA scores in predicting clinical outcomes among hospitalized adult patients with community-acquired pneumonia. *Materials and Methods:* This hospital-based prospective observational comparative study included 200 adults admitted with community-acquired pneumonia. CURB-65 and qSOFA scores were calculated at admission. CURB-65 ≥3 and qSOFA ≥2 were considered high-risk scores. Patients were followed until discharge or death. The primary outcome was in-hospital mortality, while secondary outcomes included ICU admission, mechanical ventilation, vasopressor requirement, length of hospital stay and a composite adverse outcome. Associations were examined using chi-square and Welch's *t* tests. Diagnostic performance was assessed using sensitivity, specificity, predictive values, likelihood ratios and receiver operating characteristic curves. AUCs were compared using DeLong's test, with $p<0.05$ considered statistically significant. *Results:* Among 200 patients, 27 (13.5%) died, 56 (28.0%) required ICU admission, 37 (18.5%) required mechanical ventilation, and 31 (15.5%) required vasopressor support. The composite adverse outcome occurred in 73 (36.5%) patients. High-risk CURB-65 and qSOFA scores were significantly associated with all adverse outcomes and longer hospitalization (all $p<0.001$). For the composite outcome, CURB-65 demonstrated higher sensitivity than qSOFA (69.9% versus 60.3%), with comparable specificity (87.4% versus 88.2%). Overall accuracy was 81.0% for CURB-65 and 78.0% for qSOFA. CURB-65 had a significantly higher AUC than qSOFA for predicting the composite adverse outcome (0.82 versus 0.76; difference=0.06, 95% CI: 0.01-0.11; DeLong z=2.23; $p=0.026$). *Conclusion:* Both CURB-65 and qSOFA effectively identified hospitalized patients with community-acquired pneumonia at increased risk of poor clinical outcomes. CURB-65 provided better overall discrimination and sensitivity for the composite adverse outcome, whereas qSOFA offered rapid bedside assessment with similar specificity. CURB-65 may be preferred for overall prognostic stratification, with qSOFA used as a complementary tool for detecting acute deterioration.

Keywords: *Community-acquired pneumonia; CURB-65; qSOFA.*

Introduction

Community-acquired pneumonia (CAP) is an acute infection of the pulmonary parenchyma acquired outside a hospital or healthcare facility. It remains an important cause of hospitalization, respiratory failure, sepsis and mortality, particularly among older adults and individuals with chronic cardiopulmonary disease, diabetes mellitus, renal impairment or immunological vulnerability. The clinical course of CAP varies from mild illness responding to routine antimicrobial treatment to rapidly progressive disease requiring mechanical ventilation, vasopressor support and intensive care. Early and accurate assessment of disease severity is therefore essential for selecting the appropriate level of care, guiding monitoring and treatment, and identifying patients at increased risk of adverse outcomes. Current guidelines recommend combining clinical judgement with validated severity-assessment tools when making decisions about hospitalization and escalation of care.[1]

CURB-65 is a pneumonia-specific severity score incorporating confusion, elevated blood urea nitrogen, respiratory rate ≥30 breaths/minute, low blood pressure and age ≥65 years. Each component is assigned one point, producing a total score ranging from 0 to 5. Higher scores are associated with increasing mortality and may support decisions regarding outpatient treatment, ward admission or critical-care assessment.[2] The score is simple and extensively validated; however, it requires blood urea measurement and includes age as a fixed risk factor, which may influence its performance in older populations.

Address for Correspondence Dr. Abhaykiran P, Assistant Professor, Department of General Medicine, CIMS, Chamarajanagar, India.. Email: abhaykiran.p@gmail.com

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The quick Sequential Organ Failure Assessment (qSOFA) score was introduced as part of the Sepsis-3 framework to rapidly identify patients with suspected infection who are at increased risk of poor outcomes outside the intensive care unit. It assigns one point each for respiratory rate ≥22 breaths/minute, systolic blood pressure ≤100 mmHg and altered mental status, giving a total score of 0-3.[3,4] Unlike CURB-65, qSOFA can be calculated immediately at the bedside without laboratory investigations. Nevertheless, qSOFA was developed for patients with suspected infection generally rather than specifically for CAP.

Evidence regarding the comparative prognostic performance of these scores in pneumonia remains inconsistent. A systematic review found that qSOFA ≥2 was strongly associated with mortality in pneumonia but demonstrated limited sensitivity, raising concern that some high-risk patients could be missed when it is used alone.[5] CURB-65 may provide better pneumonia-specific risk stratification, whereas qSOFA may offer faster recognition of acute physiological deterioration. Direct comparison of their ability to predict mortality, intensive care unit admission, mechanical ventilation, vasopressor requirement and prolonged hospitalization may therefore clarify their clinical utility. The present study compared CURB-65 and qSOFA scores among hospitalized patients with CAP and evaluated their accuracy in predicting clinically important outcomes.

AIM
To compare the prognostic performance of CURB-65 and qSOFA scores in predicting clinical outcomes among hospitalized adult patients with community-acquired pneumonia.

OBJECTIVES
1. To calculate CURB-65 and qSOFA scores at admission and examine their associations with in-hospital mortality, ICU admission, mechanical ventilation, vasopressor requirement and length of hospital stay.
2. To compare the sensitivity, specificity, predictive values and area under the receiver operating characteristic curve of CURB-65 and qSOFA for predicting adverse clinical outcomes.

Materials and Methods
Source of Data
Data were obtained from adult patients admitted with community-acquired pneumonia to the Department of General Medicine and associated intensive care unit of a tertiary-care teaching hospital. Information was collected through direct clinical assessment, patient or relative interviews, hospital records, laboratory reports and radiological findings.

Study Design
This was a hospital-based prospective observational comparative study. CURB-65 and qSOFA scores were calculated for every participant at admission, and the patients were followed throughout hospitalization to document clinical outcomes. Treatment decisions were made by the treating physicians according to institutional protocols and were not influenced by the investigators.

Study Location
The study was conducted in the emergency department, general medicine wards and medical intensive care unit of a tertiary-care teaching hospital.

Study Duration
The study was carried out over a period of one year, including participant recruitment, inpatient follow-up, data verification and statistical analysis.

Sample Size
A total of **200 eligible patients** with community-acquired pneumonia were included. Consecutive eligible patients admitted during the study period were recruited until the required sample size was achieved.

Inclusion Criteria
- Patients aged 18 years or older.
- Patients admitted with a clinical diagnosis of community-acquired pneumonia.
- Presence of a new pulmonary infiltrate on chest radiography or computed tomography, together with at least one compatible clinical feature such as fever, cough, sputum production, dyspnoea, pleuritic chest pain or abnormal breath sounds.
- Pneumonia acquired outside the hospital or diagnosed within 48 hours of hospital admission.
- Patients or legally authorized representatives who provided written informed consent.

Exclusion Criteria
- Hospital-acquired or ventilator-associated pneumonia.
- Hospitalization for two or more days during the preceding 90 days.
- Active pulmonary tuberculosis.
- Confirmed obstructive endobronchial lesion or primary/metastatic lung malignancy presenting with post-obstructive pneumonia.
- Severe immunosuppression, including recent chemotherapy, organ transplantation or prolonged high-dose corticosteroid therapy.
- Patients discharged, transferred or leaving against medical advice before outcomes could be assessed.
- Patients with incomplete information required to calculate either CURB-65 or qSOFA.

Procedure and Methodology
After institutional ethics committee approval, eligible patients were identified at admission. Written informed consent was obtained from each patient or an authorized representative. Demographic characteristics, presenting complaints, symptom duration, comorbidities, smoking history, prior antimicrobial use and relevant clinical findings were recorded using a structured data-collection form.

At initial assessment, temperature, pulse rate, respiratory rate, blood pressure, oxygen saturation, Glasgow Coma Scale score and mental status were documented before substantial therapeutic intervention whenever possible. The CURB-65 score was calculated by assigning one point each for confusion, blood urea nitrogen >19 mg/dL (>7 mmol/L), respiratory rate ≥30 breaths/minute, systolic blood pressure <90 mmHg or diastolic blood pressure ≤60 mmHg, and age ≥65 years. Patients were categorized as low risk (0-1), intermediate risk (2) or high risk (3-5).

The qSOFA score was calculated by assigning one point each for respiratory rate ≥22 breaths/minute, systolic blood pressure ≤100 mmHg and altered mental status. Patients with qSOFA ≥2 were categorized as having a high-risk score.

All patients received investigations and treatment according to the hospital's standard CAP-management protocol. They were followed daily until discharge or death. The primary outcome was in-hospital mortality. Secondary outcomes included ICU admission, invasive or non-

invasive mechanical ventilation, vasopressor requirement, development of sepsis or septic shock, length of hospital stay and a composite adverse outcome defined as death or requirement for organ support.

Sample Processing
Venous blood samples were collected under aseptic precautions at admission before antimicrobial administration whenever clinically feasible. Samples intended for complete blood count were collected in EDTA tubes and analysed using an automated haematology analyser. Samples for serum urea, creatinine, electrolytes, liver function tests, glucose and other biochemical measurements were collected in appropriate tubes, centrifuged and analysed using an automated biochemistry analyser.

Arterial blood gas analysis and serum lactate measurements were performed when clinically indicated. Blood and sputum samples were sent for Gram staining, culture and antimicrobial-susceptibility testing before antibiotics whenever possible. Respiratory viral testing and urinary antigen testing were performed according to clinical indications and availability. Chest radiography was performed in all participants, while computed tomography was obtained when the diagnosis was uncertain or complications were suspected. Laboratory instruments were calibrated, and internal quality-control procedures were followed according to institutional standards.

Statistical Methods
Data were entered into Microsoft Excel and analysed using an appropriate statistical software package. Continuous variables were assessed for normality using the Shapiro-Wilk test. Normally distributed variables were expressed as mean and standard deviation and compared using the independent-samples *t* test. Non-normally distributed variables were expressed as median and interquartile range and compared using the Mann-Whitney U test. Categorical variables were presented as frequencies and percentages and compared using the chi-square test or Fisher's exact test.

Associations between increasing CURB-65 and qSOFA scores and clinical outcomes were examined using appropriate tests for trend. Binary logistic regression analysis was used to determine whether the scores independently predicted mortality and other adverse outcomes after adjustment for relevant covariates. Results were reported as odds ratios with 95% confidence intervals.

Receiver operating characteristic curves were constructed for both scores. Areas under the curve with 95% confidence intervals were calculated and compared. Sensitivity, specificity, positive predictive value, negative predictive value, likelihood ratios and overall diagnostic accuracy were determined at predefined and optimal cut-off values. A two-sided *p* value <0.05 was considered statistically significant.

Data Collection
Data were collected prospectively using a predesigned and pilot-tested case-record form. The form included demographic details, comorbidities, symptoms, vital signs, mental status, laboratory results, radiological findings, CURB-65 and qSOFA components, treatment details and clinical outcomes. Each participant was assigned a unique study identification number. Completed forms were checked for accuracy and completeness, and data confidentiality was maintained throughout the study.

Results

Table 1: Comparative prognostic performance of CURB-65 and qSOFA scores for clinical outcomes (N=200)

Clinical outcome	Outcome present, n (%)	CURB-65 AUC (95% CI)	qSOFA AUC (95% CI)	Difference in AUC (95% CI)	Test of significance*	P value
In-hospital mortality	27 (13.5%)	0.84 (0.77-0.91)	0.80 (0.72-0.88)	0.04 (−0.02 to 0.10)	DeLong z=1.31	0.190
ICU admission	56 (28.0%)	0.82 (0.76-0.88)	0.77 (0.70-0.84)	0.05 (0.00-0.10)	DeLong z=1.96	0.050
Mechanical ventilation	37 (18.5%)	0.83 (0.76-0.90)	0.78 (0.70-0.86)	0.05 (−0.01 to 0.11)	DeLong z=1.65	0.099
Vasopressor requirement	31 (15.5%)	0.81 (0.73-0.89)	0.79 (0.71-0.87)	0.02 (−0.04 to 0.08)	DeLong z=0.65	0.516
Composite adverse outcome†	73 (36.5%)	0.82 (0.76-0.88)	0.76 (0.69-0.83)	0.06 (0.01-0.11)	DeLong z=2.23	**0.026**

*AUCs were compared using DeLong's test for two correlated receiver operating characteristic curves. †Composite adverse outcome included mortality, ICU admission, mechanical ventilation or vasopressor requirement.

AUC: area under the receiver operating characteristic curve; CI: confidence interval; ICU: intensive care unit.
Among the 200 hospitalized patients with community-acquired pneumonia, 27 (13.5%) died during hospitalization, 56 (28.0%) required ICU admission, 37 (18.5%) required mechanical ventilation, and 31 (15.5%) required vasopressor support. Overall, 73 patients (36.5%) experienced the composite adverse outcome. CURB-65 demonstrated consistently higher prognostic discrimination than qSOFA for all outcomes. For in-hospital mortality, the AUC was 0.84 (95% CI: 0.77-0.91) for CURB-65 and 0.80 (95% CI: 0.72-0.88) for qSOFA; however, the difference was not statistically significant (difference=0.04, DeLong z=1.31, p=0.190). CURB-65 also showed higher AUCs for ICU admission (0.82 versus 0.77), mechanical ventilation (0.83 versus 0.78), and vasopressor requirement (0.81 versus 0.79), although these differences did not reach statistical significance. For the composite adverse outcome, CURB-65 had an AUC of 0.82 (95% CI: 0.76-0.88), compared with 0.76 (95% CI: 0.69-0.83) for qSOFA. The AUC difference of 0.06 (95% CI: 0.01-0.11) was statistically significant (DeLong z=2.23, p=0.026), indicating that CURB-65 provided better overall discrimination for adverse clinical outcomes.

Table 2: Association of high-risk CURB-65 and qSOFA scores with clinical outcomes (N=200)

Scoring system and outcome	High-risk score, n (%) or Mean (SD)	Low-risk score, n (%) or Mean (SD)	Effect estimate (95% CI)	Test of significance	P value
CURB-65 classification	**≥3 (n=67)**	**<3 (n=133)**			
In-hospital mortality	19 (28.4%)	8 (6.0%)	OR=6.18 (2.54-15.07)	χ^2=19.05	**<0.001**
ICU admission	38 (56.7%)	18 (13.5%)	OR=8.37 (4.19-16.74)	χ^2=41.21	**<0.001**
Mechanical ventilation	27 (40.3%)	10 (7.5%)	OR=8.30 (3.70-18.64)	χ^2=31.75	**<0.001**
Vasopressor requirement	23 (34.3%)	8 (6.0%)	OR=8.17 (3.41-19.59)	χ^2=27.27	**<0.001**
Length of hospital stay, days	10.8 (4.9)	6.7 (3.1)	MD=4.1 days (2.8-5.4)	Welch t=6.25	**<0.001**
qSOFA classification	**≥2 (n=59)**	**<2 (n=141)**			
In-hospital mortality	18 (30.5%)	9 (6.4%)	OR=6.44 (2.69-15.42)	χ^2=20.73	**<0.001**
ICU admission	34 (57.6%)	22 (15.6%)	OR=7.36 (3.70-14.64)	χ^2=36.44	**<0.001**
Mechanical ventilation	25 (42.4%)	12 (8.5%)	OR=7.90 (3.60-17.33)	χ^2=31.63	**<0.001**

Vasopressor requirement	22 (37.3%)	9 (6.4%)	OR=8.72 (3.70-20.55)	χ^2=30.33	**<0.001**
Length of hospital stay, days	11.2 (5.1)	6.8 (3.2)	MD=4.4 days (3.0-5.8)	Welch t=6.14	**<0.001**

OR: odds ratio; MD: mean difference; CI: confidence interval; ICU: intensive care unit.
Patients with high-risk scores had substantially poorer clinical outcomes than those with low-risk scores. Among patients with CURB-65 ≥3, in-hospital mortality was 28.4%, compared with 6.0% among those with CURB-65 <3 (OR=6.18; 95% CI: 2.54-15.07; χ^2=19.05; p<0.001). High-risk CURB-65 was also significantly associated with ICU admission (56.7% versus 13.5%; OR=8.37), mechanical ventilation (40.3% versus 7.5%; OR=8.30), and vasopressor requirement (34.3% versus 6.0%; OR=8.17), with all p values <0.001. The mean hospital stay was also significantly longer among patients with CURB-65 ≥3 than among those with lower scores (10.8±4.9 versus 6.7±3.1 days), representing a mean difference of 4.1 days (95% CI: 2.8-5.4; Welch t=6.25; p<0.001).

Similarly, mortality was significantly higher among patients with qSOFA ≥2 than among those with qSOFA <2 (30.5% versus 6.4%; OR=6.44; 95% CI: 2.69-15.42; χ^2=20.73; p<0.001). A high-risk qSOFA score was associated with markedly increased odds of ICU admission (57.6% versus 15.6%; OR=7.36), mechanical ventilation (42.4% versus 8.5%; OR=7.90), and vasopressor requirement (37.3% versus 6.4%; OR=8.72); all associations were statistically significant at p<0.001. Patients with qSOFA ≥2 also had a longer mean hospital stay than those with lower scores (11.2±5.1 versus 6.8±3.2 days), with a mean difference of 4.4 days (95% CI: 3.0-5.8; Welch t=6.14; p<0.001).

Table 3: Diagnostic performance of CURB-65 and qSOFA for predicting the composite adverse outcome (N=200)

Diagnostic parameter	CURB-65 ≥3, estimate (95% CI)	qSOFA ≥2, estimate (95% CI)	Difference (95% CI)	Test of significance*	P value
True positive, n	51	44	-	-	-
False positive, n	16	15	-	-	-
False negative, n	22	29	-	-	-
True negative, n	111	112	-	-	-
Sensitivity	69.9% (58.6%-79.2%)	60.3% (48.8%-70.7%)	9.6% (−5.8% to 25.0%)	z=1.22	0.221
Specificity	87.4% (80.5%-92.1%)	88.2% (81.4%-92.7%)	−0.8% (−8.9% to 7.3%)	z=−0.19	0.849
Positive predictive value	76.1% (64.7%-84.7%)	74.6% (62.2%-83.9%)	1.5% (−13.0% to 16.0%)	z=0.21	0.835
Negative predictive value	83.5% (76.2%-88.8%)	79.4% (72.0%-85.3%)	4.1% (−5.3% to 13.5%)	z=0.85	0.398
Overall accuracy	81.0% (75.0%-85.8%)	78.0% (71.8%-83.2%)	3.0% (−4.8% to 10.8%)	z=0.75	0.451
Positive likelihood ratio	5.55 (3.42-8.99)	5.10 (3.05-8.54)	-	-	-
Negative likelihood ratio	0.34 (0.24-0.49)	0.45 (0.34-0.60)	-	-	-
Area under ROC curve	0.82 (0.76-0.88)	0.76 (0.69-0.83)	0.06 (0.01-0.11)	DeLong z=2.23	**0.026**

For predicting the composite adverse outcome, CURB-65 ≥3 correctly identified 51 patients with an adverse outcome and 111 without an adverse outcome, with 16 false-positive and 22 false-negative results. In comparison, qSOFA ≥2 produced 44 true-positive, 112 true-negative, 15 false-positive, and 29 false-negative results. CURB-65 showed higher sensitivity than qSOFA (69.9% versus 60.3%), although the 9.6% difference was not statistically significant (z=1.22, p=0.221). Specificity was comparable between CURB-65 and qSOFA (87.4% versus 88.2%; p=0.849). CURB-65 also showed slightly higher positive predictive value (76.1% versus 74.6%), negative predictive value (83.5% versus 79.4%), and overall accuracy (81.0% versus 78.0%); however, none of these differences was statistically significant. The positive likelihood ratios were 5.55 for CURB-65 and 5.10 for qSOFA, while the negative likelihood ratios were 0.34 and 0.45, respectively. The AUC was significantly higher for CURB-65 than for qSOFA (0.82 versus 0.76), with an AUC difference of 0.06 (95% CI: 0.01-0.11; DeLong z=2.23; p=0.026).

Discussion

In the present study, in-hospital mortality occurred in 13.5% of patients, while 28.0% required ICU admission, 18.5% required mechanical ventilation, and 15.5% required vasopressor support. Overall, 36.5% experienced at least one composite adverse outcome. These findings demonstrate the substantial clinical burden of hospitalized community-acquired pneumonia (CAP) and emphasize the need for reliable early risk stratification. Metlay et al. (2019)[1] similarly emphasized that severity assessment should be performed at presentation to identify patients requiring hospitalization or intensive care, although prediction scores should supplement rather than replace clinical judgement.

CURB-65 demonstrated good discrimination for in-hospital mortality, with an AUC of 0.84, compared with 0.80 for qSOFA. Although CURB-65 performed numerically better, the difference was not statistically significant. Ranzani et al. (2017)[2] found that pneumonia-specific scores such as CURB-65 generally provided better mortality discrimination than qSOFA in patients with CAP. They suggested that qSOFA should not replace established pneumonia-specific risk scores for mortality assessment. In contrast, Müller et al. (2017)[3] reported that qSOFA and CURB-65 had comparable ability to predict in-hospital mortality among emergency-department patients with pneumonia. Their observed mortality of 13.3% was also almost identical to the 13.5% mortality in the present study.

The AUCs of CURB-65 and qSOFA for ICU admission were 0.82 and 0.77, respectively, with a borderline significant difference (p=0.050). This differs partly from Müller et al. (2017)[3], who found that qSOFA was superior to CURB-65 for predicting ICU admission. That study reported that qSOFA ≥2 had high specificity but relatively low sensitivity for ICU admission. Tokioka et al. (2018)[4] also found that the relative performance of qSOFA, CURB-65 and the Pneumonia Severity Index varied according to whether mortality or ICU admission was selected as the outcome. Differences in ICU admission policies, availability of critical-care beds, population age, comorbidity burden and timing of score measurement may explain the variation between studies.

CURB-65 showed higher AUC values than qSOFA for mechanical ventilation (0.83 versus 0.78) and vasopressor requirement (0.81 versus 0.79), although the differences were not statistically significant. Zhou et al. (2020)[5], however, found qSOFA and SOFA to be superior to CURB-65 for predicting 28-day mortality, ICU admission, mechanical ventilation and vasopressor use among septic patients with CAP. Their population was restricted to patients who already met sepsis-related organ dysfunction criteria, which probably favoured qSOFA because its components directly reflect acute physiological compromise. By comparison, CURB-65 may perform better in an unselected CAP population because it incorporates pneumonia-specific variables, age and blood urea.

For the composite adverse outcome, CURB-65 achieved an AUC of 0.82 compared with 0.76 for qSOFA, and the difference was statistically significant. Thus, CURB-65 provided better overall discrimination when mortality, ICU admission, mechanical ventilation and vasopressor use were considered together. Gelaidan et al. (2024)[6], in a systematic review, similarly concluded that CURB-65 generally offered more consistent

prediction of mortality and overall pneumonia severity, whereas qSOFA showed an advantage in specificity and rapid bedside identification of patients at risk of clinical deterioration.

The present study also demonstrated strong associations between high-risk scores and individual clinical outcomes. Patients with CURB-65 ≥3 had more than six times the odds of in-hospital mortality and approximately eight times the odds of ICU admission, mechanical ventilation and vasopressor requirement. These findings support the prognostic value of a high CURB-65 score for identifying patients with severe CAP. Metlay et al. (2019)[1] recommended the use of validated prediction tools in combination with clinical assessment, while noting that CURB-65 was originally developed primarily for mortality prediction rather than for directly determining ICU admission.

Patients with qSOFA ≥2 also had markedly worse outcomes. Their odds of mortality were 6.44 times higher, while the odds of ICU admission, mechanical ventilation and vasopressor requirement were approximately seven to nine times higher than among patients with qSOFA <2. These findings are consistent with the conceptual basis of qSOFA described by Singer et al. (2016)[7] and Seymour et al. (2016)[8], in which altered mentation, tachypnoea and hypotension were identified as simple bedside indicators of increased mortality risk in patients with suspected infection outside the ICU.

Freund et al. (2017)[9] prospectively validated the Sepsis-3 criteria in emergency-department patients and reported that qSOFA offered better discrimination for in-hospital mortality than systemic inflammatory response syndrome criteria. Rudd et al. (2018)[10] similarly found that a high qSOFA score was associated with excess mortality among adults with suspected infection in low- and middle-income countries. These findings support the present observation that qSOFA ≥2 was strongly associated with mortality and organ-support requirements, although these studies included heterogeneous infections rather than CAP alone.

High-risk patients also experienced significantly longer hospitalization. The mean stay was 10.8 days among patients with CURB-65 ≥3 compared with 6.7 days among those with lower scores, while patients with qSOFA ≥2 stayed for a mean of 11.2 days compared with 6.8 days among those with qSOFA <2. Müller et al. (2017)[3] similarly demonstrated a progressive increase in hospital stay with increasing qSOFA scores. The prolonged stay may reflect greater physiological instability, complications, ICU transfer, organ support and slower achievement of clinical stability among patients with severe pneumonia.

The diagnostic analysis showed that CURB-65 ≥3 had higher sensitivity than qSOFA ≥2 for predicting the composite adverse outcome (69.9% versus 60.3%). However, both scores demonstrated similar specificity, at 87.4% and 88.2%, respectively. Jiang et al. (2018)[11], in a systematic review and meta-analysis of 17,868 patients with pneumonia, found that qSOFA ≥2 was strongly associated with mortality, with a pooled risk ratio of 3.35. Nevertheless, its pooled sensitivity was only 43%, compared with a specificity of 86%. In their CAP subgroup, sensitivity was 36% and specificity was 91%. The present qSOFA sensitivity was higher, but the overall pattern of lower sensitivity and high specificity remained consistent.

Fernando et al. (2018)[12] also found that qSOFA had relatively poor sensitivity but good specificity for mortality among patients with suspected infection. This characteristic means that a positive qSOFA score identifies a clinically important high-risk group, but a negative score cannot reliably exclude deterioration. Raith et al. (2017)[13] further demonstrated that qSOFA had lower prognostic accuracy than the full SOFA score among patients admitted to the ICU, indicating that qSOFA is more appropriate as a rapid bedside risk marker than as a comprehensive organ-dysfunction assessment tool.

Conclusion

Both CURB-65 and qSOFA were useful for predicting adverse clinical outcomes among hospitalized patients with community-acquired pneumonia. High-risk CURB-65 ≥3 and qSOFA ≥2 were significantly associated with in-hospital mortality, ICU admission, mechanical ventilation, vasopressor requirement and prolonged hospitalization. CURB-65 demonstrated consistently higher AUC values and significantly better discrimination for the composite adverse outcome than qSOFA. Although qSOFA offers rapid bedside assessment without laboratory investigations, its comparatively lower sensitivity may result in missed high-risk patients. CURB-65 may therefore be preferred for overall prognostic stratification, while qSOFA may serve as a complementary bedside tool for recognizing acute physiological deterioration. Neither score should replace comprehensive clinical assessment and serial monitoring.

LIMITATIONS

This study had several limitations. It was conducted at a single tertiary-care hospital, which may limit the generalizability of its findings to primary-care facilities, smaller hospitals and other populations. The sample size of 200 patients limited the precision of subgroup analyses and may have been insufficient to detect small differences between the two scores for individual outcomes. Both scores were calculated only at admission; therefore, serial changes in clinical condition and score performance were not evaluated. ICU admission, mechanical ventilation and vasopressor use may have been influenced by clinician judgement, institutional practices and resource availability.

Potential confounders such as comorbidities, prior antimicrobial treatment, causative pathogens, radiological severity, oxygenation indices and treatment delays may not have been fully accounted for. CURB-65 contains age and blood urea, whereas qSOFA relies entirely on physiological parameters; consequently, differences in performance may partly reflect differences in score construction. Altered mental status may also have been affected by chronic neurological conditions or inconsistent assessment. The composite outcome treated events of different clinical importance equally, and some patients may have experienced more than one component. Finally, predictive scores support risk stratification but do not establish causation or substitute for clinical judgement.

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