ORIGINAL RESEARCH PAPER

Medicine

The Study Of Utility Of CURB 65 Scoring System In Patients Of Community Acquired Pneumonia

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ABSTRACT

Community acquired pneumonia (CAP) is common cause of significant morbidity and mortality. CAP remains a therapeutic challenge to physicians to decide whether the patient is to be hospitalized or to be treated as outpatient. To achieve favorable outcomes it becomes crucial to assess the severity of CAP. The CURB-65 is a six-point, severity of illness score includes five variables: confusion, urea, respiratory rate, blood pressure and age >65 years. This study was aimed to assess severity of CAP with respect to CURB-65 and to study utility of CURB-65 for predicting outcome in CAP. We found CURB-65 to be a significant predictor of mortality in CAP as observed by ROC curve (AUC-0.812; p<0.05). Mean CURB-65 score was significantly higher in non-survivors as compared to survivors (3.78 vs 1.12; p<0.05). The sensitivity & specificity of CURB-65 score for prediction of mortality (at cut-off >2) was 100% and 88.4% respectively with an overall diagnostic accuracy of 90%. To conclude CURB-65 is objective, simple and an accurate scoring system for evaluation of CAP severity and has good predictive efficiency.

INTRODUCTION:

Community acquired pneumonia (CAP) is an acute illness acquired in the community with symptoms suggestive of lower respiratory tract infection. The incidence of radiologically confirmed CAP varied in different populations. The incidence rates are highest at the extremes of age.[1] CAP is a complex and evolving inflammatory disease leading to significant morbidity and mortality. Critical clinical deterioration can occur in CAP from various processes like respiratory failure, circulatory failure, preexisting comorbidity or hospital acquired illnesses. There is no single clinical rule which has sufficient operating characteristics to be helpful in such wide spectrum of evolution profiles.[2]

In India, enough data is not available for epidemiology of CAP. Radiographs are not routinely advised in most rural and semi-urban health facilities. Antibiotics are usually started empirically based on only history without any investigation. Those cases who do not improve are referred to a bigger hospital where chest X-ray is done and are diagnosed as pneumonia.[3] CAP remains a therapeutic challenge to physicians to decide whether the patient is to be hospitalized or to be treated as outpatient. Therefore, it is crucial to assess the disease severity, as it forms a starting point in the treatment and helps in achieving favorable outcomes. There are several scoring systems to assess the severity of CAP. Variation in clinical judgment exists from person to person and place to place. Scoring system with objective assessment can help to standardize the criteria required to assess the severity of CAP.[4] Different regions have adopted different guidelines for the management of CAP. The pneumonia severity index (PSI) was introduced in 1997 and is adopted by the American Thoracic Society. PSI consists of 20 variables and used in a wide scale in North America. PSI accurately predicts 30-day mortality, but its complexity reduces its clinical application.[5] The CURB-65 six-point scoring system (0–5) is based on both clinical and laboratory parameters and the information available at initial hospital assessment. This enabled patients to be stratified according to increasing risk of mortality.[6] The British Thoracic Society (BTS) adopted CURB-65 as a guideline for managing CAP. CURB-65 is a severity of illness score and it includes five variables: confusion, urea, respiratory rate, blood pressure and age >65 years.[7]

The present study was aimed to assess the severity with respect to CURB 65 scoring system in CAP and to study the utility of CURB 65 scoring system in predicting outcome in patients of CAP.

MATERIALS AND METHODS:

This prospective study included 50 consecutive diagnosed cases of community acquired pneumonia (CAP). The study was conducted at rural tertiary care hospital during period from December 2015 to June 2017. Informed consent was taken from all patients before being enrolled in the study. Patients more than 18 years admitted with CAP were included in the study. Patients diagnosed as tuberculosis, carcinoma of lung, patients with hospital acquired pneumonia, ventilator associated pneumonia, aspiration pneumonia and PCP pneumonia with HIV were excluded.

A meticulous history of fever, cough, sputum production and pleuritic chest pain was recorded from the patient at the time of admission. Investigations like complete hemogram, blood sugar, liver and renal function tests, chest X-ray, and sputum examination for AFB, gram stain, culture and sensitivity were done in all patients. CURB 65 score was calculated for every patient. All patients were evaluated with the help of CURB 65 scoring system for prognosis and management. CURB 65 scoring system included (each factor of the scoring system was given 1 point): (C- Confusion, U- Urea >7mmol/L, R- Respiratory rate >30/min, B- Blood pressure SBP<90 or DBP<60, 65 – Age >65 years). All patients were treated as per standard hospital protocol.

STATISTICAL ANALYSIS:

All the collected data was entered in Microsoft Excel Sheet 2007.The data was then transferred and analyzed using SPSS ver. 21. Quantitative and qualitative variables were presented as mean +/- SD and as Frequency with percentages. Chi-square test was used to know if differences observed in different groups were statistically significant. Data was described in proportion or percentages and p-value of < 0.05 was considered significant.

RESULT:
Table1. Distribution of subjects based on CURB-65 Score

CURB- 65 Score	N	%
0	7	14.0%
1	19	38.0%
2	12	24.0%
3	6	12.0%
4	4	8.0%
5	2	4.0%
Total	50	100.0%

Table 2. Distribution of subjects based on Outcome

Outcome	N	%
Death*	7	14.0%
Survived	43	86.0%
Total	50	100.0%

Table 3. Mean comparison of CURB-65 score among survivors & Non survivors.

Variables	Group	N	Mean	SD	p- value
CURB-65	Died	7	3.78	1.21	<0.05
	Survived	43	1.12	1.19	

Table 4. Receiver's Operator choice curve for CURB-65 for prediction of mortality

Area Under the Curve (Survival - Yes/ No)					
Test Result Variable(s)	Area	SE	p- value	95% CI	
				Lower	Upper
CURB-65	0.812	0.112	<0.05	0.67	0.91

Table 5. Diagnostic accuracy of CURB-65 score

CURB-65	Outcome		Total
	Survived	Died	
</=2	38	0	38
> 2	5	7	12
Total	43	7	50
Parameters	%		
Sensitivity	100.0%		
Specificity	88.4%		
PPV	58.3%		
NPV	100.0%		
Accuracy	90.0%		

DISCUSSION:

In this present study we observed, mean CURB-65 score was significantly higher in non survivors as compared to survivors (3.78 vs 1.12; p<0.05). AUC is used frequently to assess severity of CAP. AUC explains relationships between sensitivity and specificity. AUC is considered to have moderate discriminating power from a value of 0.70 and above. CURB-65 was found to be a significant predictor of mortality in cases of CAP as observed by ROC curve (AUC- 0.812; p<0.05). The sensitivity & specificity of CURB-65 score for prediction of mortality (at cut-off >2) was 100% and 88.4% with an overall diagnostic accuracy of 90%. Shah et al.8 also studied the accuracy of CURB-65 as compared to PSI score and concluded that both CURB-65 and PSI were found to have equal sensitivity to predict death from CAP. Many authors used this score and observed to be a significant predictor of mortality in CAP. Alavi-Moghaddam M et al.9 in their study observed the sensitivity and specificity of CURB-65 in predicting mortality as 100% and 82.3% respectively. Guo Q et al.10 observed the sensitivity and specificity of a CURB-65 score of ≥ 3 criteria in predicting mortality as 25% and 37.5 % which increased to 75 % and 62.5 % while the cut-off values reduced to ≥ 2 criteria respectively.

We thus conclude that CURB-65 is objective, simple and an accurate scoring system for evaluation of CAP severity and has good predictive efficiency. The routine use of the score will identify patients with mild CAP thus potentially reducing unnecessary admission.

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