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COMPARISON OF BASELINE CURB-65, A-DROP, QSOFA AND CALL SCORES IN PREDICTING OUTCOME IN COVID-19 PATIENTS: A RETROSPECTIVE STUDY

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ABSTRACT
Background: Covid-19 was declared pandemic in march 2020. Since then, there has been surges and falls in cases. According to epidemiologist further surges in cases are expected. A simple and reliable scoring system will be very useful in triaging and managing cases during such outburst of cases. In this study we compare various severity scores and their efficacy of predicting outcome in Covid-19 patients. **Aim:** To study the efficacy of CURB-65, A-DROP score, qSOFA and CALL scores in predicting the outcome of covid 19 positive patients. To compare the above scores at baseline and their accuracy in predicting the outcome retrospectively. **Methods:** In this single centre retrospective study 400 patients admitted in Victoria Hospital Bangalore with severe Covid-19 were enrolled. Baseline CURB-65, A-DROP, qSOFA and CALL scores were calculated and the outcome was compared retrospectively. The sensitivity, specificity, positive and negative predictive values were calculated using standard cut-offs. **Results:** Among 400 patients, 295 patients were discharged and 105 patients died. Sensitivity specificity, positive predictive value and negative predictive value for CURB65 were 65%, 94%,73% and 91%, for A-DROP were 87%,86%,89%and 94%, for qSOFA were 49%,83%,74% and 93% and for CALL score were 82%,45%,35% and 88% respectively. **Conclusion:** A-DROP score was overall better and reliable outcome predictor among severe Covid-19 patients, followed by CURB65, qSOFA and CALL scores. Utility of A-DROP score after obtaining baseline investigations can help prioritizing and managing the cases in future waves of Covid-19.

KEYWORDS : Covid-19, CURB-65, A-DROP, qSOFA, CALL

INTRODUCTION

The new corona virus SARS-CoV-2 is the cause of COVID-19 (Corona Virus Disease 2019), a viral respiratory ailment. It is an RNA virus that is a member of the coronaviridae family and the subgenus sarbecovirus of the genus beta-coronavirus. When attempting to determine what caused a cluster of pneumonia cases in Wuhan, China, the virus was initially discovered. [1] Wuhan, China, reported the first case of COVID-19 in December 2019. The COVID 19 outbreak was deemed a "Public health emergency of International Concern" by World Health Organization (WHO) in January 2020. On March 11, 2020, the epidemic was classified as "Pandemic" since it was rapidly spreading throughout numerous nations. As of the 9th of December 2022, 643875406 confirmed cases of COVID-19, including 6630082 fatalities, had been reported to WHO globally. All facets of society are affected by the sickness brought on by COVID-19.

The devastation brought on by COVID-19 since 2020 has been particularly dreaded in India. 530658 fatalities and 44676045 cases have been documented as of December 9th, 2022. It is impossible to ignore the financial, emotional, and financial toll that COVID-19 has on all socioeconomic groups.

A simple and reliable scoring system will be very useful in triaging and managing cases during such outburst of cases. In this study we compare various severity scores and their efficacy of predicting outcome in Covid-19 patients. CURB 65, which consists of Confusion, Urea > 7mmol/L, Respiratory rate > 30, SBP <90 or DBP <60, Age > 65, Cut-off of ≥ 3 was considered. Age ≥70 in males, ≥75 in females. A-DROP score, which consists of dehydration (BUN >21mg/dL), respiratory failure, orientation, SBP <90, Cut-off of ≥ 3 was considered. qSOFA, which consists of altered mental status, respiratory rate >22, SBP <100, cut-off of ≥ 2 was considered. CALL score, which consists of comorbidity, age, lymphocyte count and LDH, a cutoff of ≥8 was considered. (Tables 1-4)

Table 1: CURB-65 score

SYMPTOM	POINTS
Confusion	1
Urea >7 mmol/L	1
Respiratory rate ≥30	1
SBP ≤90 mmHg or DBP ≤60	1
Age ≥65 years	1

Table 2: A-DROP score

SYMPTOM	POINTS
Age ≥70years in male, ≥75 years in females	1
Dehydration, BUN ≥21mg/dL	1
Respiratory failure PaO2≤60 or SpO2 ≤90	1
Orientation disturbance	1
SBP ≤90mmHg	1

Table 3: qSOFA score

SYMPTOM	POINTS
GCS <15	1
Respiratory rate ≥22	1
SBP ≤100mmHg	1

Table 4: CALL score

SYMPTOM	POINTS
Comorbidity With Without	1 4
Age (years) ≤60 >60	1 3
Lymphocyte (x 109/L) >1 ≤1	1 3
LDH (U/L) ≤250 250-500 >500	1 2 3

MATERIALS AND METHODS

Study Design:
Retrospective observational study. All consecutive patients aged between 18years -75years admitted in Victoria hospital, Bangalore with RTPCR or antigen test positive for Covid-19 during the study period were considered eligible for participation in the study.

Study Period: May 2021 to July 2021

Place Of Study: Study was conducted in Victoria Hospital attached to Bangalore Medical College and Research Institute.

Sample Size: 400

Study Procedure
Present study is a retrospective observational study. 400 consecutive patients admitted in Victoria hospital, Bangalore with Covid-19 RTPCR or Rapid antigen test positive, during the period of May 2021 to July 2021. Demographic details, clinical examination, and laboratory investigations were obtained from patient case files. Baseline scores were calculated for CURB-65, A-DROP, qSOFA and CALL scores. Primary outcomes (in hospital death or discharge) were measured retrospectively. Outcomes were compared with the different scores calculated at the time of admission. Predictive values of
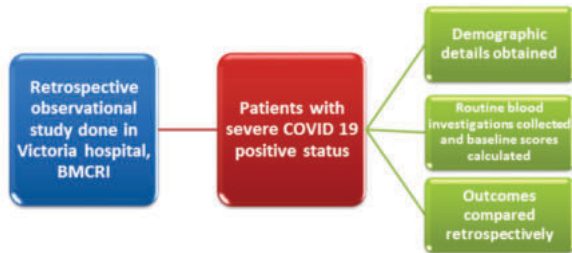

Figure 1: Study procedure

Outcomes And Prognostic Scores
Data collected included demographic characteristics, vital signs, blood investigations and radiological investigations at the time of admission. Primary outcome studied was in hospital all cause mortality. Secondary outcome studied was requirement of ICU admission.

Statistical Analysis
Data collected were analyzed in computer by using the Statistical Package for Social Sciences (SPSS) program version 10. Data analysis was done by using descriptive and inferential statistical methods: frequency, percentage, mean.

RESULTS
Most common age group observed in this study is 41-50 years (22.7%) followed by 51-60 years (17.7%). In this study 55% of subjects were males and 45% were females with male: female ratio of 1:1.2. Among the study population of 400 patients, 295 patients were discharged (73.7%) and 105 patients died (26.3%). Among study population, 30.5% patients had ICU admission. In this study CURB-65 score showed sensitivity of 65% and specificity of 94%, positive predictive value of 73% and negative predictive value of 71%. In this study A-DROP score showed sensitivity of 87% and specificity of 86%, positive predictive value of 89% and negative predictive value of 94%. In this study qSOFA score showed sensitivity of 49% and specificity of 83%, positive predictive value of 74% and negative predictive value of 93%. In this study CALL score showed sensitivity of 82% and specificity of 45%, positive predictive value of 35% and negative predictive value of 88%.

Table 5: Age group among study population

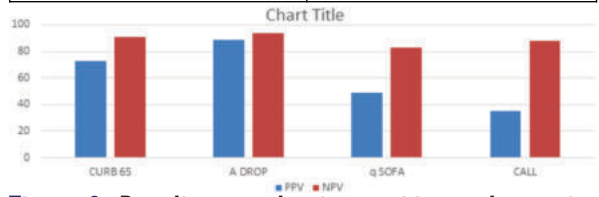| Age group	Number of patients
18-20	23
21-30	55
31-40	68
41-50	91
51-60	71
61-70	58
71-75	34
TOTAL	400

Figure 2: Bar diagram showing positive and negative predictive values of severity scores
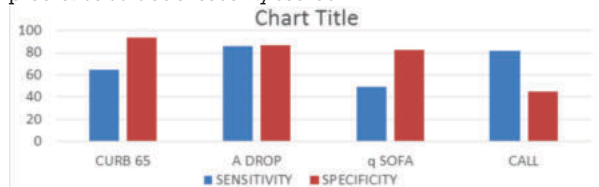

Figure 3: Bar diagram showing sensitivity and specificity of severity scores

DISCUSSION
Since the COVID-19 pandemic spread across the world, health care systems have faced new challenges in predicting morbidity and mortality in patients with COVID-19. The accuracy of a variety of severity scores to predict in-hospital death in 400 laboratory confirmed COVID-19 patients admitted to hospital was examined in our study and we found A-DROP was a priority clinical tool for predicting the risk of death for patients with COVID19 pneumonia, compared with other score systems. A-DROP, a modified version of CURB-65, [2] showed better accuracy of in-hospital death prediction compared to other current widely used CAP-specific tools. According to previous studies, ARDS was common in severe COVID-19 pneumonia. [3,4] The rapid progression of diffuse bilateral ground-glass opacities CT scan and massive alveolar damage with focal hemorrhage, cellular fibro myxoid exudates and hyaline membrane formation in lung histological examination also suggested a close association between COVID-19 pneumonia and low PaO2/FiO2. The modification of more accurate respiratory function evaluation (SpO2 < 90% / PaO2 < 60mmHg in A-DROP vs. respiratory rate $\geq$ 30/min in CURB-65) could be one reason for improvement in the discrimination of A-DROP. CURB-65 the standard scoring system used in community acquired pneumonia did not perform well in predicting mortality in our study. It underestimated the risk of mortality. In this study CALL score had very less specificity and positive predictive value. qSOFA score low sensitivity as well as positive predictive value compared to A-DROP score.

A similar study done by Guohui Fan et.al also concluded that A-DROP score had better mortality prediction as compared to CURB-65, CRB-65, qSOFA and NEWS-2 scores. [5] Another similar study done by Patrick Bradley et.al concluded that qSOFA and CURB-65 should not be used as mortality predictors in Covid-19. [6]

CONCLUSION
A-DROP score was overall better and reliable outcome predictor among severe Covid-19 patients, followed by CURB65, qSOFA and CALL scores. Utility of A-DROP score after obtaining baseline investigations can help prioritizing and managing the cases in future waves of Covid-19.

REFERENCES

1. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395(1022):497e506.
2. Miyashita N, Matsushima T, Oka M, Japanese Respiratory S. The JRS guidelines for the management of community-acquired pneumonia in adults: an update and new recommendations. Intern Med 2006: 45(7): 419-428.
3. Huang C, et.al Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020: 395(10223): 497- 506.
4. Wu C, et.al Risk Factors Associated with Acute Respiratory Distress Syndrome and Death in Patients with Coronavirus Disease 2019 Pneumonia in Wuhan, China. JAMA internal medicine 2020.
5. Fan G, Tu C, Zhou F, et al. Comparison of severity scores for COVID-19 patients with pneumonia: a retrospective study. Eur Respir J 2020;
6. Bradley P, Frost F, Tharmaratnam K, et al. Utility of established prognostic scores in COVID-19 hospital admissions: multicentre prospective evaluation of CURB-65, NEWS2 and qSOFA. BMJ Open Resp Res 2020;7:e000729. doi:10.1136/bmjresp-2020-000729