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(BAP65) Score versus (DECAF) Score in Assessment of Acute Exacerbation of Chronic Obstructive Pulmonary Disease

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Abstract

A common, preventable, and treatable disease characterised by persistent respiratory symptoms and airflow limitation due to airway and/or alveolar abnormalities, typically resulting from extensive exposure to noxious particles or gases, and influenced by host factors including abnormal lung development is Chronic Obstructive Pulmonary Disease (COPD). The purpose of this research was to compare the previously established BAP65 score to the newly developed DECAF score for its ability to predict mortality and the requirement for IMV in patients admitted to the intensive care unit with AECOPD. Methods: Fifty people with COPD exacerbation were included in this research from our emergency rooms and intensive care units at Benha University. Comparison of BAP 65 score components between survivors and patients who passed away revealed statistically significant differences for BUN >25 (21.43 percent in the discharged group versus 62.50 percent in the died group, P = 0.018), Altered mental status (11.90 percent in the discharged group versus 50.00 percent in the died group, P = 0.026), and pulse >109 bpm (21.43 percent in the discharged group versus 75.00 percent in the died group, P = 0.002). Ages >65 did not significantly differ between the two groups (40.48 percent in the discharged group vs 75.00 percent in the dying group, P = 0.073). Conclusions: COPD is a severe health disease that affects patient health and life, and represents a burden for the health services. The mean value of BAP 65 score was 2.191.04 in the discharged group, and 3.751.58 in the deceased group, with a very significant difference between groups (P= 0.001). Early identification and adequate care of COPD improves patient prognosis since exacerbations are the leading cause of death in COPD patients. A patient's prognosis during AECOPD may be evaluated using not just clinical judgement, but also the BAP65 and DECAF scoring systems, which take into account a variety of parameters.

Keywords: BAP65, DECAF, Acute Exacerbation, Chronic Obstructive Pulmonary Disease.

1. Introduction

According to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2020 revision, COPD is "a prevalent, preventable, and treatable disease that is characterised by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities, typically caused by extensive exposure to noxious particles or gases, and influenced by host factors, including abnormal lung development." [1] According to the American Thoracic Society and the European Respiratory Society, an immediate change in a patient's dyspnea, cough, or sputum above normal variability that is sufficient to require a change in treatment constitutes an acute exacerbation of COPD (AECOPD). [2]

Around the globe, chronic obstructive pulmonary disease (COPD) is among the main causes of death and disability. It was responsible for three million fatalities in 2016, much more than the 1.7 million deaths attributable to lung cancer and other forms of respiratory cancer. Eighty percent or more of exacerbations are treated with medication such as bronchodilators, corticosteroids, and antibiotics in an outpatient setting. Although AECOPD is a frequent reason for ICU admission, the quality of care that should be given to patients admitted with the diagnosis is still up for debate [3,]. The long-term prognosis after hospitalisation for COPD exacerbation is dismal, with a death rate of almost 50% after five years. Patients who are at high risk of dying while in the hospital may be better triaged, have more aggressive therapy implemented, and have more positive outcomes and discharge plans established if their mortality risk is known at the time of admission. Patients hospitalised with an exacerbation of chronic obstructive pulmonary disease (COPD) have historically had a poor prognosis, despite the fact that these episodes are frequent and sometimes deadly. Many studies have looked at prognostic indices for stable COPD, and techniques for assessing mortality risk, including the BODE score, are now well-established. [6] In 2009, it was recommended to use the increased BUN altered mental state, Pulse > 109 beats/min, Age > 65 years (BAP-65) grading system in AECOPD. Both the requirement for MV and in-hospital mortality were linked to it. [7] A different and more recent cohort study on 34,699 admissions to 177 US hospitals validated the (BAP-65) grading system in 2011. The BAP-65 system was a straightforward method for classifying AECOPD patients. [8] In 2012, a scoring system based on the presence of dyspnea, eosinopenia, consolidation, acidemia, and tachycardia (DECAF) was developed to predict in-hospital mortality in AECOPD hospitalised patients. [9] The (DECAF) scoring system was validated in a large cohort study between 2012 and 2014 as a simple predictive tool that can stratify patients according to mortality risk, with low-risk patients requiring Hospital at Home (HAH) or early

supported discharge (ESD), and high-risk patients requiring early escalation planning (DECAF >= 3). This research compared the DECAF score to the previously established BAP65 score and assessed its use for predicting mortality and the requirement for IMV in patients admitted to the intensive care unit (ICU) with AECOPD.

2. Patients and methods

Fifty people with COPD exacerbation were included in this research from our emergency rooms and intensive care units at Benha University. As of October 2021, the trial will go through December 2022. Benha University's institutional review board (IRB) okayed the study's procedures. Prior to the start of the trial, informed permission was acquired from the patients or their family members.

In order to be included, each patient met the following criteria: All Adult Patients 40 whose Primary Diagnosis Is (AECOPD) Or Who Have A Secondary Diagnosis Of (Acute Respiratory Failure) (AECOPD)

Criteria for exclusion AECOPD was not the major cause for hospitalisation and the patient's life expectancy was just 12 months (e.g., metastatic malignancy)

Patients above the age of 40 and their smoking index (defined as "a measure for quantifying cigarettes consumed over a lengthy time and computed using the following formula: smoking index = CPD years of tobacco use") were given extra attention throughout the history collection process. A rating of dyspnea based on the elongated version of the Medical Research Council's Dyspnea Scale. A Global and Regional Look: Pay close attention to the patient's heart rate and Glasgow Coma Scale degree of awareness. Arterial blood gas (ABG) analysis, complete blood count (CBC), prothrombin time, liver function test, renal function test, and electrolyte analysis are just few of the procedures that may be performed in the lab (Na, and K). Radiology Exams: It's possible to diagnose COPD using a chest x-ray, but it's not certain. In order to rule out other potential causes of dyspnea in COPD patients (such pneumonia or emphysematous bullae rupture), an X-ray will be taken. A BAP65 score is determined by 1) having a blood urea nitrogen (BUN) level that is more than 25. Second, you have a severe mental impairment (GCS>14). Thirdly, a heart rate of more than 109 beats per minute. The fourth criterion is a senior age of 65 or more.

The components of the DECAF score are as follows: 1) Dyspnea according to eMRCD Va/Vb 2. 2) Low eosinophil count (less than 0.05 109/L). (3) Integration (chest x-ray). 4. The Academic World (pH 7.3). Five) Atrial Fibrillation (AF).

Each AECOPD patient's outcome was documented (whether they were helped by medical therapy alone, required NIV, were intubated with IMV, or passed away) and compared to the two rating systems.

We compared the BAP65 score with the DECAF score in terms of their ability to predict whether or not an AECOPD patient would die within 30 days and whether or not they would need invasive mechanical ventilation.

Statistical Analysis:

After collecting and entering data onto a computer, it was analysed statistically using SPSS version 25 (Statistical Package for the Social Sciences). Association between qualitative factors was examined using the Chi square test (X2) and the independent student t test. Diagnostic accuracy, as well as sensitivity, specificity, and both positive and negative predictive values, were computed. The optimum cutoff value was identified using the ROC (Receiver Operating Characteristics) curve. Two-tailed person correlation coefficient was employed to demonstrate association between measurements. Traditionally, a p-value of less than 0.05 was thought to indicate statistical significance.

3. Results

Fifty of the seventy-five COPD patients who were screened met the inclusion criteria. After receiving treatment, 42 were released, but 8 did not survive.

Table 1 displayed sociodemographic information. Significant group differences were seen in AF (P=0.005). Diabetes, high blood pressure, coronary heart disease, and chronic kidney disease all occurred at similar rates. There was a hundred percent prevalence of dyspnea among the fifty patients.

Cough with sputum was significantly different between those who survived and those who did not (47.62 percent discharged versus 87.50 percent died, P. value = 0.038), while there was no difference between those who survived and those who did not in terms of Altered sensorium (11.9 percent discharged versus 50.00 percent died, P. value = 0.26). Both the HR (mean value 101.1210.15 in the discharged group and 111.8810.7 in the died group, P. value = 0.009) and the RR (mean value 29.386.13 in the discharged group and 35.257.64 in the died group, P. value = 0.021) were significantly different between the discharged and deceased patients, but the HR was not different between the two groups. Table 1

Table (1) Sociodemographic data, presenting complaints and vital signs.

		Live (n=42)	Died (n=8)	*p*-value
Age (years)		63.95±7.23	69.63±9.05	0.057
Sex	♂	33(78.57%)	6(75.00%)	0.57
	♀	9(21.43%)	2(25.00%)	
Comorbidities	**DM**	31(73.81%)	6(75.00%)	0.94
	HTN	29(69.05%)	5(62.50%)	0.71
	AF	7(16.67%)	5(62.50%)	0.005
	IHD	17(40.48%)	3(37.50%)	0.59
	CKD	2(4.76%)	2(25.00%)	0.11
Presenting complaints				
Dyspnea		42(100%)	8(100%)	-----
Cough with sputum		20(47.62%)	7(87.50%)	0.038
Altered sensorium (GCS<14)		5(11.90%)	4(50.00%)	0.26
Vital signs				
HR		101.12±10.15	111.88±10.7	0.009
RR		29.38±6.13	35.25±7.64	0.021
SBP		117.98±14.79	102.77±20.04	0.15
DBP		71.71±16.4	61.13±15.6	0.99

Out of fifty patients 18(42.86%) had Cyanosis. Besides, 9(21.43%) of the patients had Clubbing. LL edema also presented in 24(57.14%). 41(97.62%) had wheezy and 9(21.43%) had Crepitation. There was statistically significant difference between discharged and died patients only in Wheezy (97.62% discharged versus 87.50% died with P. value = 0. 014). The mean value of HB was 13.35±0.94 in discharged group and 12.7±2.92 in died group, while the mean value of TLC was 14.73±5.9 in discharged group and 17.35±3.55 in died group. Eosinophil had a mean value of 0.159±0.12 in discharged group and 0.079±0.098 in died group. The mean value of INR was 0.997±0.17 in discharged group and 1.17±0.316 in died group, while the mean value of Creatinine was 1.07±0.477 in discharged group and 1.46±0.639 in died group. BUN had a mean value of 20.17±5.6 in discharged group and 34.81±15.81 in died group. There was no statistically significant difference between the patients who discharged and died regarding Biochemical parameters. There was statistically significant difference between the patients who discharged and died regarding PCO2 with mean value of 57.94±11.41 in discharged group and 69.88±15.61 in died group (P. value = 0. 014), but there was no statistically significant difference between the patients who discharged and died regarding PO2, pH, RBS or HCO3. **Table 2**

Table (2) General physical examination, Biochemical parameters and Blood gas analysis

General physical examination	Live	Died	*p*-value
Cyanosis	18(42.86%)	5(62.50%)	0.3
Clubbing	9(21.43%)	3(37.50%)	0.28
LL edema	24(57.14%)	4(50.00%)	0.5
Wheezy	41(97.62%)	7(87.50%)	0.014
Crepitation	9(21.43%)	4(50.00%)	0.1
Biochemical parameters			
HB	13.35±0.94	12.7±2.92	0.55
TLC	14.73±5.9	17.35±3.55	0.23
Eosinophil	0.159±0.12	0.079±0.098	0.93
INR	0.997±0.17	1.17±0.316	0.162
Creatinine	1.07±0.477	1.46±0.639	0.047
BUN	20.17±5.6	34.81±15.81	0.035
Blood gas analysis			
PO_2	59.99±11.25	52.96±5.52	0.14
pH	7.29±0.057	7.18±0.139	0.054
RBS	153.79±58.66	181.9±79.69	0.247
HCO_3	29.17±4.67	27.38±5.1	0.33
PCO_2	57.94±11.41	69.88±15.61	0.014

In DECAF scoring, significantly higher number of patients in discharged group had (eMRCD 1-4) 40(95.24%) in discharged versus 4(50.00%) in died with P value = 0.004) and significantly higher number of patients in died group had (eMRCD 5b) 0(0.00%) in discharged versus 4(50.00%) in died with P value <0.001), Eosinopenia (7(16.67%) in discharged versus 5(62.50%) in died with P value = 0.005), Consolidation (20(47.62%) in discharged versus 7(87.50%) in died with P value = 0.038), Acidemia (40. 47% in discharged versus 100% in died with P value = 0.011) and AF (21.43% in discharged versus 62.50% in died with P value = 0.018). DECAF score has a mean value of 1.29± 0.97 in discharged group and 3.88±2.29 in died group with significant difference between the groups (P value = 0.015). Table 3

This table showed that components of BAP 65 score were compared between survivors and died patients, statistically significant difference was found in BUN >25 (21.43% in discharged group vs. 62.50% in died group, P = 0.018), Altered mental status (11.90% in discharged group vs. 50.00% in died group, P = 0.026) and pulse >109 bpm (21.43% in discharged group vs. 75.00% in died group, P = 0.002). Comparison in age >65 years between the two groups, was not found to be significant (40.48% in discharged group vs. 75.00% in died group, P = 0.073). The mean value of BAP 65 score was 2.19±1.04 in discharged group and 3.75±1.58 in died group with highly significant difference between groups (P= 0.001). Table 4 and Figure 1

The AUROC for prediction of mortality for DECAF score was (0.679-1.000) with 95% confidence interval (CI) and for BAP‑65 score was (0.635-1.000) with 95% CI. Both DECAF and BAP ‑65 scores performed well for prediction of in‑hospital mortality with 87.50% Sensitivity for DECAF score and 75% for BAP65 score while the specificity was 61.9% and 54.76% for DECAF score and BAP‑65 score respectively. The positive predictive value (PPV) in prediction of mortality for DECAF and BAP65 was 46.67% and 38.71% respectively while the negative predictive value (NPV) was 92.86% for DECAF score and 85.19% for BAP65 score. The accuracy in the prediction of mortality for DECAF score was 68.97%, while for BAP65 score was 60.34%. The AUROC for prediction of mortality for DECAF score was 0.827 (95% CI: 0.620¬¬–1.000) and for BAP65 was 0.789 (95% CI: 0.575¬¬–1.000) indicating a good validity. Figure 2.

Table (3) DECAF score parameters

		Live	Died	*p*-value
Dyspnea (eMRCD 1-4)	**Too dyspneic**	40(95.24%)	4(50.00%)	0.004
	Not too dyspneic	2(4.76%)	4(50.00%)	
Dyspnea (eMRCD 5a)	**Too dyspneic**	2(4.76%)	0(0.00%)	0.7
	Not too dyspneic	40(95.24%)	8(100.00%)	
Dyspnea (eMRCD 5b)	**Too dyspneic**	0(0.00%)	4(50.00%)	<0.001
	Not too dyspneic	4(9.52%)	4(50.00%)	
Eosinopenia (<0.05×109/l)		7(16.67%)	5(62.50%)	0.005
Chest radiography (Consolidation)		20(47.62%)	7(87.50%)	0.038
Acidemia (pH<7.3)		17(40.47%)	8(100.00%)	0.011
Electrocardiography (Atrial fibrillation)		9(21.43%)	5(62.50%)	0.018
DECAF score		1.29± 0.97	3.88±2.29	0.015

Table (4) BAP65 score parameters.

	Live	Died	*p*-value
BUN >25	9 (21.43%)	5(62.50%)	0.018
Altered mental status	5(11.90%)	4(50.00%)	0.026
Pulse >109 bpm	9(21.43%)	6(75.00%)	0.002
Age >65 years	17(40.48%)	6(75.00%)	0.073
BAP65 score	2.19±1.04	3.75±1.58	0.001

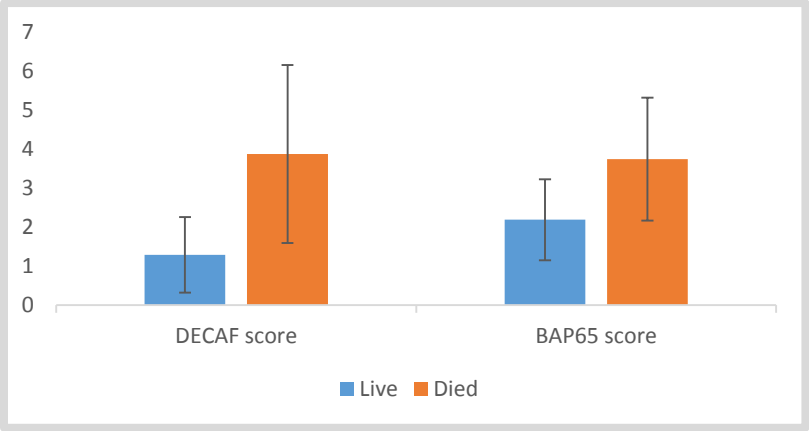

Fig 1: means of BAP65, DECAF scores in discharged and died patients

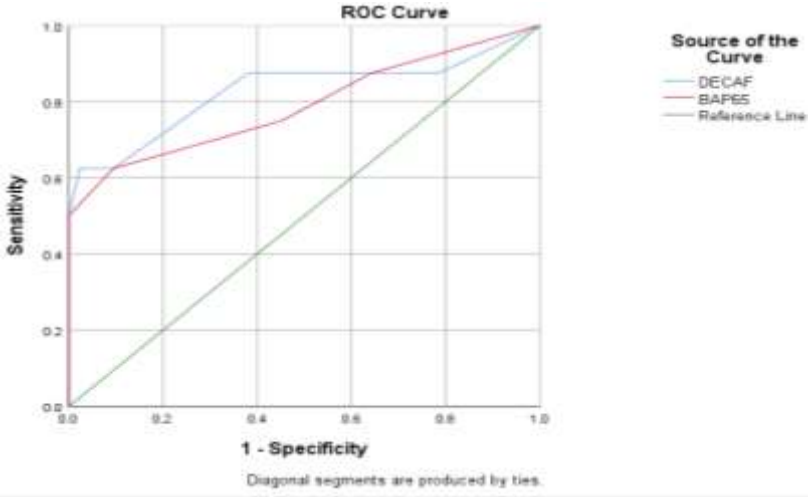

Fig 2: Receiver operator characteristic curve for mortality

The AUROC for the need of mechanical ventilation (MV) was (0.506-0.842) for DECAF score and (0.533-0.859) for BAP‑65 score with 95% CI for each. Sensitivity of DECAF and BAP‑65 scores for prediction of MV need was 66.7% and 72.2% respectively, while the specificity was 55% for both. The positive predictive value (PPV) in prediction of MV need for DECAF and BAP65 was 40% and 41.94% respectively while the negative predictive value (NPV) was 87.57% and 81.48% respectively. The accuracy in the prediction of MV need for DECAF score was 58.62%, while for BAP65 score was 60.34%.

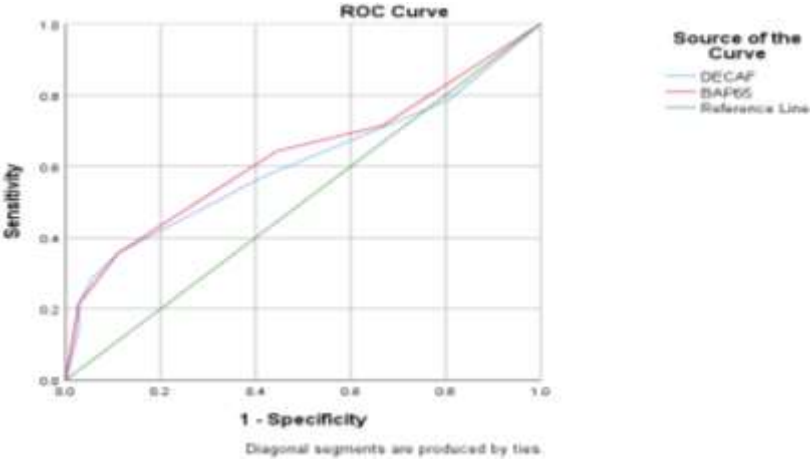

Fig 3: Receiver operator characteristic curve for need for mechanical ventilation

There is a positive linear relationship between DECAF score and BAP65 score on Pearson's graph with a significant correlation (r = 0.418, P = 0.003).

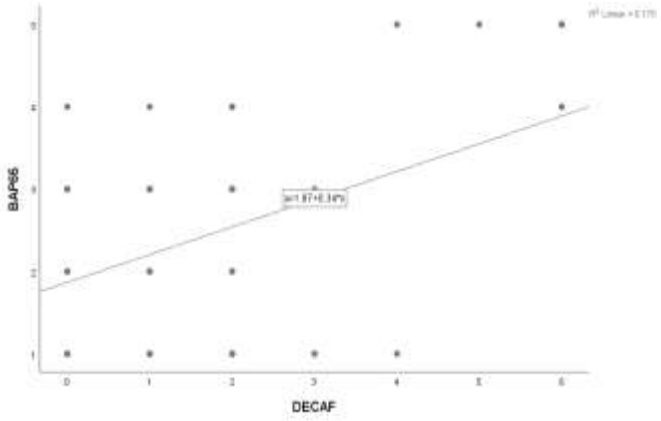

Fig 4: Pearson's graph showing a positive linear correlation between BAP65 and DEACAF scores

4. Discussion

50 patients who met the study's criteria for inclusion were examined. We had 42 successful treatment outcomes and 8 hospital deaths (16%). Mortality rates for AECOPD patients were 4%, 10.4%, and 18% in the studies conducted by Shorr et al., Steer et al., and Sangwan et al., respectively, which may be attributable to variations in the threshold for hospital admission across nations. (9, 158, 161) Both the discharged (33, or 78.57 percent) and deceased (6, or 23.73 percent) patients were mostly male (75.00 percent). However, there were only 9 females (21.43%) and 2 females (25.00%) in the groups that survived and perished, respectively. This finding is consistent with that of the sangwan et al. research, which found that sex had no role in predicting death from AECOPD (P value 0.595). Exposure to tobacco smoke and other risk factors likely contributes to the rise in COPD rates. Thus, men outnumber females in the rates of worsening health and mortality. [11]

Statistically significant differences were reported in the DECAF score components of eMRCD Vb (0% vs. 50%, P = 0.001), Eosinopenia 0.05 109/L (16.67% vs. 62.50%), consolidation (47.52% vs. 87.50%, P = 0.038), academia pH 7.3 (40.47% vs. 100%, P=0.011), and AF (21.43% vs. When Sangwan et al. examined the DECAF score components between live and dead patients, they discovered statistically significant differences in eMRCD Va (56.1% vs. 100%, P = 0.007), Eosinopenia 0.05 109/L (12.2% vs. 77.8%, P 0.001), consolidation (34.1% vs. 89.9%, P = 0.007), and AF (0% v Among contrast, no statistically significant difference was discovered between eMRCD Vb and pH 7.3 in the academic community. [11]

According to the eMRCD grading system, the severity of dyspnea in the study's survival and mortality groups was as follows: I-IV (95.24 percent vs. 50.0 percent), Va (4.76 percent vs. 0.00 percent), and Vb (0.0 percent vs. 0.00 percent) (0.00 percent vs 50.0 percent). The mortality rate was significantly correlated with eMRCD-Vb (P 0.001) but not with eMRCD-Va. Exacerbations of diseases have a significant risk of death, and those patients who are unable to do even the most basic self-care tasks, such as bathing and clothing, are particularly vulnerable.

Steer et al. discovered a substantial (P 0.001) link between the median eMRCD scores of patients who survived and died, 4 (3-5a) and 5 (5a and b), respectively, therefore these findings are comparable. (158) The finding is comparable to that of Sangwan et al., who found statistical significance in eMRCD Va but nowhere else. Only two patients in the research had an eMRCD Vb score, therefore the disparity may be attributable to a lack of statistical power or to differences in patients' perceptions of the activities that cause dyspnea. [11]

According to the results of this research, eosinopenia (defined as an eosinophil count of 0.05 109/L) is a strong predictor of mortality in AECOPD, with a statistically significant difference between the survival and death rates (16.67 percent vs. 62.50 percent, P = 0.005). This agrees with the finding from the research by sangwan et al. (12.2% vs. 77.8%, P 0.001). [11]

Ali et al. conducted a retrospective analysis of 151 patients with COPD to determine the significance of eosinopenia in predicting death and readmission. Studies have linked low eosinophil counts to an increased risk of death, greater frequency of hospitalisation, and a more virulent strain of bacteria. [12]

Since chest infection is not only a major risk factor in COPD exacerbation but also regarded a main cause of mortality in these patients, there is a substantial difference in consolidation between the surviving and dead groups (47.62 percent and 87.50 percent, P = 0.038). Multiple studies showed that it was an effective mortality predictor and that it influenced risk rating methods. [13]

Twenty-five patients, or 12.5%, of those in a research comparing DECAF to other risk scoring systems found to have a primary diagnosis of AECOPD died while hospitalised. To predict in-

hospital mortality, the DECAF Score outperformed both the APACHE II Score (AUROC = 0.68, DECAF versus APACHE II p = 0.03) and the COPD and Asthma Physiology Score (CAPS) (AUROC = 0.65, p = 0.01). In addition, for the subset of patients with radiological consolidation, DECAF was a substantially higher predictor of inhospital mortality than CURB-65 (AUROC = 0.87 vs 0.65, p = 0.02). [13]

31 individuals (7%) died within 30 days of hospital admission in a separate research of 423 patients that compared the effectiveness of DECAF with other prognostic scores: CURB-65, CRB-65, and BAP-65 in predicting 30-day mortality in patients hospitalised with exacerbations of COPD without pneumonia. There was no significant difference in mortality prediction across the scores (CURB-65 = 0.69, CRB-65 = 0.64, BAP-65 = 0.64, DECAF = 0.65, P = 0.186). To put it another way, among patients admitted to the hospital with AECOPD who do not have pneumonia, basic clinical scores that depend on fewer laboratory indicators are at least as effective as DECAF in predicting early death. [14]

Due to airway constriction and carbon dioxide retention, respiratory acidosis is a typical consequence in respiratory failure. A significant difference was found in the survival rates of those exposed to an academic environment with a pH level below 7.3 (40.47 percent vs. 100 percent, P=0.011). Sangwan et al. found no statistically significant association between PH and death. The tiny sample size may be to blame, but it's also likely that all of the patients who survived had already developed respiratory acidosis. [11]

In this analysis, AF was present in 62.50 percent of the patients who passed away but only 21.43 percent of those who were given a clean bill of health and were allowed to go home. The alterations in blood gases, pulmonary functions, and hemodynamics that accompany AECOPD increase the risk of the development of AF. Complications arise with therapy for these illnesses when AF is present. Beta-adrenergic agonists and theophylline, which are sometimes used to treat COPD exacerbations, have been linked to the development of atrial fibrillation (AF) with fast ventricular response. It is clear from this research that pharmacologic and electrical cardioversion are ineffective treatments for AF in patients with COPD until respiratory decompensation has been addressed.

When the whole DECAF score was taken into account, we found that death rates increased significantly (P = 0.015) as DECAF levels increased. The median SD DECAF score was 1.290.97 vs. 3.882.29 for those who survived and 3.882.29 for those who passed away, respectively (P 0.015). The area under the ROC curve for the DECAF score in predicting death was 0.827 (95% CI: 0.679-1.000), while the area under the ROC curve for predicting the requirement for invasive ventilation was 0.674 (95% CI: 0.506-0.842).

This is in line with the findings of Sangwan et al. Whereas, when comparing median and interquartile range (IQR) for DECAF score between survivors and patients who passed away, a statistically significant connection was detected (2.0 [1-3] vs. 4.0 [3.5-5.0], P 0.001). To predict in-hospital mortality, the area under the ROC curve was 0.86 (95% CI: 0.82-0.89). Also, the area under the ROC curve for determining whether or not a patient will need mechanical breathing was 0.881. (95 percent CI: 0.790-0.972). [11]

In a recent research, Memon MA et al. (2018) evaluated the DECAF score in 162 patients with AECOPD over the course of two years (2016-2018). The greatest in-hospital mortality rate was seen in individuals with DECAF scores of 3-5, accounting for 21 deaths (14.0%) (92 percent). The DECAF scores of 0 and 1 are significant predictors of survival (p = 0.04, 0.03), whereas the DECAF values of 4 and 6 are significant predictors of death (p 0.0001). The study found that the DECAF score, although being a very basic instrument, was able to successfully stratify mortality risk groups among COPD patients hospitalised with acute exacerbations. [15]

Individual components of the BAP65 score were compared between the survivors and the deceased, and significant differences were found for BUN >25 (21.43 percent vs. 62.50 percent, P = 0.018), Altered mental status (11.90 percent vs. 50 percent, P=0.026), and pulse >109 bpm (21.43 percent vs. 75 percent, P = 0.002). The difference in percentage of people aged 65 and above between the two groups was not statistically significant (40.48 vs. 75.0%, P = 0.073).

When the whole BAP65 score was taken into account, we found that as mortality rose, so did the BAP65 score (P = 0.001). Comparison of median BAP65 scores between those who lived and those who did not (2.911.04 vs. 3.751.58, P = 0.001) was statistically significant. Both the area under the ROC curve (BAP65 score) for predicting death and the requirement for invasive ventilation were high at 0.789 (95% CI: 0.635-1.000) and 0.696(95% CI: 0.533-0.859), respectively, demonstrating strong validity.

Area under the ROC curve for BAP65 score in predicting mortality and requirement for IMV in the study by Shorr et al. was 0.77 (95% CI: 0.76-0.78) and 0.78 (95% CI: 0.78-0.79), respectively. Area under the ROC curve for the prediction of death was 0.915 (95% CI: 0.828-1.001) and for the requirement for invasive ventilation it was 0.797 (95% CI: 0.665-0.928) in the research by Sangwan et al. [8]. Tabet et al. [11] analysed data from 980 AECOPD patients admitted to two hospitals in Lebanon (from 2005 to 2013). One hundred

seventy patients (17.3 percent) needed to be ventilated mechanically, and 59 people (6 percent) died while in the hospital. Both outcomes were shown to rise as BAP-65 scores rose, with 1.3% of patients requiring intubation at a score of 0 or 1 and 74% with a score of 3 or 4 (P 0.001). Patients who received a score of 0 or 1 had a 1 percent mortality rate, whereas those who received a score of 3 or 4 had a 51 percent mortality rate (P 0.001). Therefore, the BAP-65 scoring system seemed to be a helpful and straightforward technique to categorise the patients presenting with AECOPD, and it correlated with both the requirement for mechanical ventilation and death. [16]

A second research including 114 AECOPD patients treated at Tribhuvan University Teaching Hospital's emergency room. There were a total of 16 fatalities, and 12 people required mechanical ventilation. The severe category accounted for the vast majority of deaths and required mechanical breathing (BAP class IV and V). While less than 1% of patients in BAP class I required MV, over 50% of patients in BAP class V did. Mortality and the requirement for Mechanical Ventilation were shown to rise significantly (P 0.0001) with each successive BAP 65 class.

The Pearson correlation graph reveals a significant relationship (r = 0. 418, P = 0.003) between the DECAF score and the BAP65 score for predicting mortality and the requirement for MV in AECOPD patients. A linear relationship was discovered between DECAF score and BAP65. In terms of predicting mortality and the requirement for mechanical ventilation, both scoring systems performed well. But the better DECAF score was seen in the former and the better BAP65 score was shown in the later.

The sensitivity of the DECAF score and the BAP-65 score for predicting mortality was both 100%, with the specificity being 34% and 63.4 %, respectively, which is comparable to the results observed by sangwan et al. (r = 0.602, P 0.001). When it comes to predicting whether or not a patient would need mechanical breathing, the sensitivity of the DECAF score was 80%, the specificity of the BAP-65 score was 60%, and the accuracy of both was 100%. [11]

Since BAP-65 scoring is "consistent and generalizable," it has been recommended by Tabet and others to replace DECAF. Area under the receiver operator characteristic (AUROC) curves for the derivation and validation investigations demonstrated that DECAF consistently and excellently discriminated. Both were superior than the BAP-65's erratic results (AUROC 0.77 and 0.79, respectively) [9, 10].

Despite their assurances that the BAP-65 indices are objective, there is still room for error in the evaluation of patients' mental health, which might be seen as a major limitation of the system. Paramedics providing salbutamol nebulizers before to admission might increase pulse rate, diminishing the diagnostic value of that parameter. There was no correlation between pulse rate and hospital mortality in the DECAF derivation research. [9]

5. Conclusion

Chronic obstructive pulmonary disease (COPD) is a serious health issue that negatively impacts patient health and life, and places a strain on healthcare systems. Early identification and adequate care of COPD improves patient prognosis since exacerbations are the leading cause of death in COPD patients. A patient's prognosis during AECOPD may be evaluated using not just clinical judgement, but also the BAP65 and DECAF scoring systems, which take into account a variety of parameters. In light of the results of this research, we find that: Exacerbation of chronic obstructive pulmonary disease (COPD) patients may be scored to help identify those at high risk of death. Patients with COPD who have a high risk score need to have their treatment for the condition, which may include medication and/or mechanical breathing, increased early on. Third, deciding where to get therapy for AECOPD is aided by a patient's severity score at the time of admission (Intensive care or ward). 4. It aids the doctor in communicating with the patient and their loved ones about the prognosis and the short-term hazards associated with exacerbations. 5. The DECAF and BAP65 scores are useful since their determination requires just a few elementary questions and common laboratory tests, making them convenient for use in real life. Good indicators of mortality and the requirement for IMV were found to be DECAF and BAP65 scores, 6.

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