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Original Research Article

ANALYSIS OF BAP 65, DECAF SCORE, AND CAUDA70 SCORE AS PREDICTORS OF OUTCOMES AND MORTALITY IN ACUTE EXACERBATION OF COPD IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Chronic obstructive pulmonary disease (COPD) is a prevalent condition that can be prevented and treated, defined by ongoing respiratory symptoms and restricted airflow resulting from abnormalities in the alveoli or airways, typically due to significant exposure to harmful particles or gases.1,2
Aim and Objectives: This study aimed to compare the prognostic value of three different scoring methods of Acute exacerbation of COPD(AECOPD) : DECAF score , BAP65 score, CAUDA70 score in predicting outcome and mortality in the patient with AECOPD.
Material and Methods: Study Design: Prospective hospital-based observational study. Study area: The study was conducted in the Department of Pulmonary Medicine in MVJ MC AND RH. Study Period: 1 year from June 2023- June 2024. Study population: The present study involved 100 cases of chronic obstructive pulmonary disease with acute exacerbation. Sample size: The study consisted of 100 subjects. Sampling method: Simple random Sampling Technique. All these patients with exacerbation of COPD underwent routine clinical, radiological and laboratory assessment and appropriate treatment was initiated as decided by the treating clinician. Investigations followed standard of care. All the data needed for the proposed scoring systems were collected from patients, hospital records.
Results: 29.2% died with score >3, 33.3% died with score 0-1, 37.5% died with score>2, There is a significant association between mortality and BAP 65 score. Among the study subjects 14.3% had score>3, 57.1% had score >2, 28.6% had score0-1. 34.8% readmission with score 0-1, 65.2% readmission with score 2 There is a significant association between BAP 65, DECAF, CAUDA70 and 30 day readmissions.
Conclusion: Our findings imply that a straightforward clinical prediction tool that incorporates indices that are frequently available at the time of hospital admission will help stratify patients with AECOPD into risk categories that are clinically relevant, which may help clinicians manage these patients. In conclusion, we propose that the DECAF, BAP 65, and CAUDA 70 scores all play a part in clinical practice.
Keywords: BAP65 score, COPD mortality and mechanical ventilation, DECAF score.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a prevalent condition that can be prevented and treated, defined by ongoing respiratory symptoms and restricted airflow resulting from abnormalities in the alveoli or airways, typically due to significant exposure to harmful particles or gases.[1,2] COPD ranks as the fourth leading cause of mortality

worldwide, with projections indicating it will become the third leading cause by 2020. In 2012, over three million individuals died from chronic obstructive pulmonary disease, representing 6% of total deaths globally.[3] while tobacco smoking is the primary risk factor for COPD, other environmental factors such as exposure to biomass fuels and air pollution may also play a role.

Various scoring systems have been developed and implemented for patients with AECOPD to forecast morbidity and mortality. Nevertheless, these scoring methods are not commonly utilized in clinical settings, and there is a lack of standardized comparisons among different scoring methods to evaluate prognosis in AECOPD patients within the Indian population. Therefore, there is a necessity for a reliable prediction tool that can estimate mortality and morbidity, assist healthcare providers in recognizing at-risk groups, prioritize patients for appropriate care levels, and facilitate the timely escalation of care. During admission, it is crucial to determine which patients can be managed in wards with non-invasive ventilation, as opposed to those in high-risk categories who necessitate admission to intensive care and support through mechanical ventilation.

Our research assesses the effectiveness of the BAP 65, DECAF, and CAUDA70 scoring systems in predicting mortality and morbidity in Indian patients with AECOPD. According to GOLD GUIDELINES, COPD exacerbations are classified as mild (managed with only short-acting bronchodilators), moderate (managed with short-acting bronchodilators along with antibiotics and oral corticosteroids), and severe (requiring hospitalization or emergency room visits).[1]

Numerous AECOPD assessment results were created and examined (individually) at various centers worldwide. APACHE 2 score,[4] (acute physiology and chronic health evaluation), 2008 score,[5,6] CAPS score[7] (The COPD and Asthma Physiology Score), BAP 65 score[8] (blood urea nitrogen, altered mental status, pulse rate, age 65-), DECAFscore,[9,10] (dyspnea, eosinopenia, consolidation, acidemia, fibrillation), CAUDA70 score (confusion, acidosis, urea, dyspnea, albumin, 70-age NEWS score,[11,12] (National Early Warming Score), LACE index,[13,14] (length of admission, acuity of admission, Charlson co morbidity index, exacerbation in the last six months requiring hospital visits), etc. Each of these ratings examined many parameters, such as hospital mortality, 30-day readmissions, risk assessment for recurring admissions, and the need for mechanical ventilation. BAP 65, DECAF score, and CAUDA 70 score. These scores used for morbidity and mortality assessment. Nevertheless, there is no standard comparison of scoring techniques to evaluate prognosis in AECOPD patients in an Indian community, and these scoring systems are not frequently employed in clinical practice. In order to help clinicians identify risk groups, triage patients to the appropriate level of care, escalate care levels early, and distinguish between high-risk groups that require mechanical ventilation support and intensive care admission and those that can be treated in wards with non-invasive ventilation, a reliable prediction tool that can predict mortality and morbidity is therefore essential.

In our research, we selected patients experiencing moderate to severe exacerbations of COPD that necessitated hospital admission, and we tracked them for 30 days following their discharge in relation to readmission rates and mortality within that timeframe. Patients with less severe exacerbations, who were treated in outpatient departments (OPD) and day care settings, were excluded from our study due to the challenges associated with follow-up and because the focus of the study was on the morbidity and mortality linked to moderate to severe exacerbations.

BAP-65 score,[8] DECAF score,[9,10] and CAUDA 70 score BAP 65

- Elevated BUN [>25 mg/dl],
- Altered mental status [GCS- Glasgow coma scale ≤ 14],
- Pulse [>109 beats per minute], and Age [>65 years

A new model that was developed to predict mortality and need for mechanical ventilation (MV) during hospitalization of patients with AECOPD.[8]

Each variable would get minimum score 0 and maximum score of 1.

DECAF score

DECAF score (Dyspnoea, Eosinopenia, Consolidation, Respiratory Acidosis and Atrial Fibrillation

- e MRCD 5a (Too breathless to leave the house unassisted but independent in washing and/or dressing)- extended medical research council dyspnoea score
- e MRCD 5b (Too breathless to leave the house unassisted and requires help with washing and dressing)
- Eosinopenia (eosinophils <0.05×109/L)
- Consolidation on chest radiograph
- Moderate or severe acidaemia (pH <7.3)
- Atrial Fibrillation (including history of paroxysmal atrial Fibrillation

CAUDA 70 score

1. Confusion
2. Acidosis, pH < 7.35
3. Urea > 7milli moles per lit
4. Dyspnea grade-IV
5. Albumin < 35g/lit
6. Age 70 or above

Aim and Objectives

This study aimed to compare the prognostic value of three different scoring methods of Acute exacerbation of COPD(AECOPD): DECAF score, BAP65 score, CAUDA70 score in predicting outcome and mortality in the patient with AECOPD.

MATERIALS AND METHODS

Study Design: Prospective hospital-based observational study.
Study Area: The study was conducted in the Department of Pulmonary Medicine in MVJ Medical College.
Study Period: 1 year from June 2023- June 2024.
Study population: The present study involved 100 cases of chronic obstructive pulmonary disease with acute exacerbation.
Sample Size: The study consisted of 100 subjects.
Sampling Method: Simple random Sampling Technique.
Inclusion criteria:
The criteria for selection of the cases are based on detailed history of all such patients, physical examination, 12 lead electrocardiograph, arterial blood gas analysis, radiological findings attending emergency and respiratory medicine department.

- Age > 40 years
- Smoking history of > 10 cigarette pack years
- Primary diagnosis of pneumonic or non-pneumonic exacerbations of COPD.
- Pre admission with or without spirometric confirmation of air flow obstruction.

Exclusion Criteria
Patients who are non-cooperative

- Age < 40 years
- History of any illness other than COPD likely to limit survival less than 1 year(malignancy)
- Patient on domiciliary ventilation.

This study included all the patients with COPD, defined and classified according to the GOLD 2023 update. (1) now presenting with acute exacerbation. Patients with moderate to severe exacerbation requiring hospital admission were included in study. Ethics committee approval was obtained from hospital ethics committee and institutional review board. Informed consents were obtained from patients and/or family members.
All these patients with exacerbation of COPD underwent routine clinical, radiological and laboratory assessment and appropriate treatment was initiated as decided by the treating clinician. Investigations followed standard of care. All the data needed for the proposed scoring systems were collected from patients, hospital records.
The collected data included age, sex, history of smoking, ethanol intake, co morbid condition details, details regarding previous exacerbations ,vaccination history and assessment of state dyspnoea grade at presentation based on the extended Medical Research Council Dyspnoea Score,[15] clinical examination including assessment of including assessment of conscious level and signs of severity of exacerbation (cyanosis, use of accessory inspiratory muscles, paradoxical abdominal movement, asterixis, neurological impairment), chest radiological examination, electro cardiogram-ECG, arterial blood gases analysis, measurement of blood urea nitrogen (BUN), complete blood count (CBC).
Severity scores for AECOPD were calculated for each patient (DECAF score, BAP-65 score and CAUDA70 score), patients were managed according to their condition and prognosis was recorded: recovery and discharge or in-hospital mortality. Patients were followed up (at OPD and through telephone conversation) for a period of one-month post discharge for exacerbations requiring hospital readmissions and mortality by telephonic conversation.
Statistical Analysis of Data
The data has been entered into MS- Excel and statistical analysis has been done using IBM SPSS Version 24.0. For categorical variables, the data values are represented as number and percentages. To test the association between the groups chi- square test was used. For continuous variables, the data values are shown as mean and standard deviation. To test the mean difference two groups, student's t - test was used. To represent a sensitivity / specificity pair corresponding to a particular decision, Receiver operating characteristic (ROC) curve was used and to measure how well a parameter can distinguish between two diagnostic groups, the area under ROC(AUC) curve was used. All the P values having less than 0.05 are considered as stastically significant.

RESULTS

Mean age of subjects who expired was 70.16 ± 8.444 years and among those who survived was 67.74 ± 7.490 years. There was no significant difference in age distribution with respect to mortality. [Table 1]
In the study 70% were males and 30% were females. Among males, 79.2% had mortality and among females, 20.8% had mortality. There was no significant association between gender and mortality.
In the study 29% (N=29) were admitted in ward, 33% (N=33) in HDU (high dependency unit) and 38% (N=38) in ICU (intensive care unit).
Among males, 28.3% had 30 day readmissions and among females it was 32.0%. There was no significant difference in 30 day readmissions between two groups (p = 0.738). In this study 34(34%) had COPD class C, 66(66%) class D.
In the study 34% (n=34) were non-smokers, 53% (n=53) were ex-smokers and 13% (n=13) were current smokers. In the study among never smokers, 17.6% had mortality, among Ex-smokers, 24.5% had mortality and among current smokers 38.5% had mortality. There was no significant association between mortality and smoking.
In the study 14.3%(N=10) had DM (diabetes mellitus), 18.6%(N=13) had HTN (systemic hypertension), 18.6% had (N=13) CAD (coronary artery disease), 1.4%(N=1) had CKD+CAD+HTN

(chronic kidney disease, coronary artery disease and hypertension), 15..7%(N=11) had DM + HTN , 2.9%(N=2) had DM and CAD , 20%(N=14) had DM,HTN,CAD. [Table 2]

In the study among those with ≥2 exacerbations, 27.1% expired and among those with <2 exacerbations, 21.2% expired. There was no significant association between expired and no of exacerbations requiring hospital admissions. [Table 3]

In study among those without hypoxia 4.2%, those with mild hypoxia 50% had mortality, those with moderate hypoxia 41.7% had mortality and those with severe hypoxia, 4.2% had mortality. There was significant association between hypoxia and mortality. [Table 4]

In the study, out of 17 subjects with Low risk,0% had mortality, out of 30 subjects with Moderate risk, 3.3%% had Mortality at Hospital, 0% had Mortality at 30 days and overall mortality was 3.3% in moderate risk group. In High risk group, 32.07% had Mortality at Hospital, 9.43% had Mortality at 30 day and overall mortality was 43.39% in High risk group. There was significant difference in Mortality at Hospital and Overall Mortality between different risk groups based on DECAF score. Among the study subjects with DECAF score 17.6% had low risk, 30% had moderate risk ,53% had risk

In the study among those with low risk, none had readmission at 30 day, among those with moderate risk, 17.4% had readmissions at 30 day and among those with high risk DECAF score,82.6%% had readmissions on Day 30. There was significant association between moderate-high DECAF score and 30 day readmissions.

In the study among those with Low Risk (N=17) none of them required NIV/MV, in moderate risk group (N=30), 34.5% (N=10) required NIV 3.4% (N=1) required/MV, where as in high risk group (N=53) 33.3% (N=18) required NIV 37.0%(N =20) required/MV.

BAP 65 score among study subjects: Among study subjects 11% had score > 3, 53% had score 0-1, 36% had score 2. [Table 5]

29.2% died with score >3, 33.3% died with score 0-1, 37.5% died with score>2, There is a significant association between mortality and BAP 65 score. Among the study subjects 14.3% had score>3, 57.1% had score had score >2, 28.6% had score0-1. 34.8% readmission with score 0-1, 65.2% readmission with score 2 There is a significant association between BAP 65 and 30 day readmissions. [Table 6]

In the study according to CAUDA70 score, 55% had high risk, 20% had moderate risk and 25% had low risk. In the study 55 subjects had high risk score, 23 expired (41.81%), 20 had medium risk 1 (5.0%), 25 had low risk and 0%expired in low risk group. 73.9% readmissions with score>3, 8.7% readmissions with score 0-1, 17.4% readmissions with score 2. There is a significant association with 30 day readmissions and CAUDA 70 score.

In the study among those with oxygen supplementation, 21.8%% had high risk, 72.0% had moderate risk and 72% had low risk. Among those with NIV, 40.0% had high risk, 25% had moderate risk and 4.0% had low risk. Among those with MV, 34.5% had high risk, 10.0% had moderate risk and 0% had low risk. There was significant association between CAUDA70 score and type of ventilation. [Table 7]

The test result variable(s): BAP_ACT_SCR, DECAF_ACT_SCR, CAUDA_70_ACT_SCR has at least one tie between the positive actual state group and the negative actual state group. Statistics may be biased.

For total mortality, the AUROC (area under receiver operative curve) for DECAF is 0.86, CAUDA70 - 0.86, BAP 65 - 0.71.

There was significant association between mortality and DECAF Score and CAUDA Score, BAP 65 score.

There was significant association between mortality and DECAF Score and CAUDA Score. [Table 8]

Table 1: Mean Age of the subjects with respect to mortality

	Mortality	N	Mean	Std. Deviation	t-value	P Value
Age	Survived	76	67.70	6.978	-1.370	0.174 (Not Sig.)
	Death	24	70.13	9.223		

Table 2: Gender distribution of subjects

		Frequency	Percent
Valid	Male	70	70.0
	Female	30	30.0
	Total	100	100.0

Table 3: Association between Mortality and no of exacerbations

			No of exacerbations		Total
			< 2	>= 2	
Mortality	Survived	Count	41	35	76
		% within MORTALITY	53.9%	46.1%	100.0%
		% within No of exacerbations	78.8%	72.9%	76.0%
	Death	Count	11	13	24

		% within MORTALITY	45.8%	54.2%	100.0%
		% within No of exacerbations	21.2%	27.1%	24.0%
Total		Count	52	48	100
		% within MORTALITY	52.0%	48.0%	100.0%
		% within No of exacerbations	100.0%	100.0%	100.0%

Table 4: Association between hypoxia and mortality

ABG * MORTALITY Cross tabulation

			MORTALITY		Total
			Survived	Death	
ABG	> 80	Count	42	1	43
		% within ABG	97.7%	2.3%	100.0%
		% within MORTALITY	55.3%	4.2%	43.0%
	80-60	Count	18	12	30
		% within ABG	60.0%	40.0%	100.0%
		% within MORTALITY	23.7%	50.0%	30.0%
	60-40	Count	12	10	22
		% within ABG	54.5%	45.5%	100.0%
		% within MORTALITY	15.8%	41.7%	22.0%
	< 40	Count	4	1	5
		% within ABG	80.0%	20.0%	100.0%
		% within MORTALITY	5.3%	4.2%	5.0%
Total		Count	76	24	100
		% within ABG	76.0%	24.0%	100.0%
		% within MORTALITY	100.0%	100.0%	100.0%

Chi-Square value = 20.881, P Value<0.0001 (Very High Sig.)

Table 5: Association between DECAF and mortality

DECAF_ACT_SCR * MORTALITY Cross tabulation

			MORTALITY		Total
			Survived	DEATH	
)ECAF_ACT_S CR	0	Count	1	0	1
		% within DECAF_ACT_SCR	100.0%	0.0%	100.0%
		% within MORTALITY	1.3%	0.0%	1.0%
	1	Count	16	0	16
		% within DECAF_ACT_SCR	100.0%	0.0%	100.0%
		% within MORTALITY	21.1%	0.0%	16.0%
	2	Count	29	1	30
		% within DECAF_ACT_SCR	96.7%	3.3%	100.0%
		% within MORTALITY	38.2%	4.2%	30.0%
	3	Count	20	7	27
		% within DECAF_ACT_SCR	74.1%	25.9%	100.0%
		% within MORTALITY	26.3%	29.2%	27.0%
	4	Count	10	11	21
		% within DECAF_ACT_SCR	47.6%	52.4%	100.0%
		% within MORTALITY	13.2%	45.8%	21.0%
	5	Count	0	5	5
		% within DECAF_ACT_SCR	0.0%	100.0%	100.0%
		% within MORTALITY	0.0%	20.8%	5.0%
Total		Count	76	24	100
		% within DECAF_ACT_SCR	76.0%	24.0%	100.0%
		% within MORTALITY	100.0%	100.0%	100.0%

Chi-Square value = 37.555, P Value < 0.0001 (VHS)

Table 6: Association between Bap 65 score and mortality

		BAP_65_SCR				Total
		> 3		0-1	2	
MORTALITY	SURVIVED	Count	4	45	27	76
		% within MORTALITY	5.3%	59.2%	35.5%	100.0%
		% within BAP_65_SCR	36.4%	84.9%	75.0%	76.0%
	DEATH	Count	7	8	9	24
		% within MORTALITY	29.2%	33.3%	37.5%	100.0%
		% within BAP_65_SCR	63.6%	15.1%	25.0%	24.0%
Total		Count	11	53	36	100
		% within MORTALITY	11.0%	53.0%	36.0%	100.0%
		% within BAP_65_SCR	100.0%	100.0%	100.0%	100.0%

Chi-square value = 11.799, P Value = 0.003 (Sig.)

Table 7: Association between CAUDA 70 and Mortality

			MORTALITY		Total
			Survived	Death	
CAUDA_70_S CR	3	Count	32	23	55
		% within CAUDA_70_SCR	58.2%	41.8%	100.0%
		% within MORTALITY	42.1%	95.8%	55.0%
	0-1	Count	25	0	25
		% within CAUDA_70_SCR	100.0%	0.0%	100.0%
		% within MORTALITY	32.9%	0.0%	25.0%
	2	Count	19	1	20
		% within CAUDA_70_SCR	95.0%	5.0%	100.0%
		% within MORTALITY	25.0%	4.2%	20.0%
Total		Count	76	24	100
		% within CAUDA_70_SCR	76.0%	24.0%	100.0%
		% within MORTALITY	100.0%	100.0%	100.0%

Chi-Square value = 21.426, P Value < 0.0001 (VHS)

Table 8: Auroc curve for mortality

Case Processing Summary

MORTALITY	Valid N (list wise)
Positive[a]	24
Negative	76

a. The positive actual state is DEATH.

Area Under the Curve

Test Result Variable(s) Area		Std. Error	P Value	Asymptotic 95% Confidence Interval	
				Lower Bound	Upper Bound
BAP_ACT_SCR	.713	.065	.002 SIG	.585	.841
DECAF_ACT_SCR	.869	.038	<0.0001 VHS	.794	.943
CAUDA_70_ACT_SCR	.869	.038	<0.0001 VHS	.794	.943

DISCUSSION

In this study, we compared three AECOPD scoring systems, DECAF score, BAP 65 score and CAUDA70 score for their diagnostic accuracy for predicting in- hospital mortality, 30 day readmissions and 30 day mortality from the date of discharge. This study included 100 patients hospitalized with moderate to severe exacerbation of COPD admitted from OPD and emergency department to the wards, HDU (high dependency units) and MICU (medical intensive care units).

In the present study mean age of COPD patients (100 patients) is 68.28 years with a standard deviation of is 7.59. Highest of the mean ages in the studies is 73.91 in the study done by Son et al16 and least of mean ages in studies is 46.46 in the study done by Mohamed H .Zidan et al,[17] mean age of above 70 years is observed in three studies out of six studies considering standard deviation the highest age in the group may go beyond 80 years. In the present study mean age of 61.63 ± 9.97 is comparable to the study done by Ramadan Nafae et al,[18] However, in our study the differences in the mean age of the surviving and non-surviving groups were not significantly different We observed a trend of higher mortality among those who were older.

In the present study males accounted for 70% and females accounted for 30% Present study can be compared with study of Son et al that is a percentage of 76.2% in males and 23.8% in females. This distribution shows that we had more patients in older age groups than younger age groups. this is consistent with the fact the age is often listed as risk factor for COPD.

In the present study all males are smokers, the reason for maximum percentage of males. Present study compared to studies could be the high prevalence of smoking in this gender and males are more susceptible to smoking than females. COPD is a male dominant disease as men are more prone for pollution as for their working atmosphere and culture that greater percentage of men are bread earners in the family and take every task outside home in this part of country. The present study of 30 COPD female patients, there is a significant history of exposure to smoke of burnt biomass fuels in their homes or work environment in this part of the country, cooking is predominantly by using wood. this is possibly a strong risk factor for development of COPD among female patients.

In the present study mortality in AECOPD cases is 24% and highest percentage of mortality can be seen in our study while study with least percentage of mortality is with Son et al,[16] study. In a study conducted by Karin H Groenewegen et al,[19] the mortality rate was 8%. study by Connors et al,[20] the mortality was 11%.

In other studies less mortality might have been due to early approach of the patient to the better health facilities, early availability. In COPD the most common cause of death is respiratory (35%) with approximately 75% occurring after a COPD exacerbation. Cardiovascular deaths occurred in

26% of cases, with the most common cause being sudden death. Cancer caused 21% of deaths, about two-thirds being due to lung cancer.

The mortality among the male patients is 19 out of 70; the mortality among the female patients is 5 out of 30. There is no significant association between gender and outcome. this could be attributed to very low number of female participants in the study. This agrees with the findings by S Yu et al,[21] and Cooper et al,[22] who showed that gender was not an independent risk for short or long term prognosis in acute exacerbation of COPD.

In our study group of 100 patients various co-morbid conditions were looked into, we found that 18.6% (n=13) had hypertension (HTN), 14.3%% (n=10) had diabetes mellitus (DM), 18.6%(n=13) coronary artery disease (CAD), 1.4% (n=1) had HTN+CAD+CKD and 15.7(n=11)% had DM + HTN, 2.9%(n=2) had DM and CAD , 20%(n=14) had DM+HTN+CAD.

The principal contributor to hypoxemia in COPD patients is ventilation/perfusion (V/Q) mismatch resulting from progressive airflow limitation and emphysematous destruction of the pulmonary capillary bed. Exacerbations of COPD are frequently associated with deterioration in gas exchange and associated hypoxemia, low PO2 is well known to be associated with high risk of mortality. In a study conducted by viral sangawan compared DECAF score and BAP 65 26.8% need mechanical ventilation, 65.9% required NIV. And AUROC of DECAF for mortality is 0.91, AUROC of BAP 65 for mortality is 0.91 AUROC of DECAF for mechanical ventilation is 0.88; AUROC of BAP 65 for mechanical ventilation is 0.79.

In the present study need for mechanical ventilation is 21%, 28% required NIV, AUROC of DECAF for mortality is 0.86, BAP 65 for mortality is 0.71 AUROC of DECAF for mechanical ventilation is 0.88, BAP 65 for mechanical ventilation 0.65. In a study conducted by Shorr et al,[23] for prediction of mortality and need for IMV, the area under the ROC curve for BAP 65 score was 0.77 and 0.78.

In our study the individual parameters of BAP 65 was significant, with increase in BAP 65 there is increase in mortality, which is similar to the study conducted by shorr et al.[23] In a study conducted byRaafatElsokkary et al,[24] the total mortality was 17.2%, need for MV was 54.4%, mortality and need for mechanical ventilation increases with high score AUROC for mortality and MV of CAUDA70 is 0.82 and 0.79. In the present study AUROC for mortality and MV for CAUDA 70 is 0,86 and 0.88.

In a study conducted by RabihTabet et al25 1.3% of patients with a score of 0 to 1 of BAP65 score needed intubation, < 1% with 0 to 1 score expired. In the present study 8 patients with score of 0 to1 needed mechanical ventilation and 8 with 0 to 1 are expired. In a study conducted by prasanna purna et al26 in assessment of CAUDA70 in AECOPD 48 patients required NIV, 15required invasive ventilation, 4 expired in the present study 28 required, 21 required invasive ventilation. In the present study both DECAF and CAUDA scores are equally good in predicting the need for mechanical ventilation.

CAUDA70 Score: with this score, there were 52.1% scored at high risk, 23.1% at moderate risk and 24.8% at low risk. Among those with overall mortality there were 87.5% with a high-risk CAUDA score, 9.4% with a moderate risk score and 3.1% with a low risk CAUDA score. There was a significant association between high CAUDA70 score and mortality ($p<0.001$); however, it was inferior to the DECAF score in diagnostic accuracy for mortality (BAP 65 score was poorest among the three) In R Moghal et al,[27] study even our study proved the same DECAF score is superior than CAUDA 70 and BAP65.

In our study AUROC of DECAF score for mortality is 0.86. In Archibald R et al,[28] study CAUDA 70 exceeds that of existing scores (CURB65, CRB65, BAP65) with a area under the receiver operating curve (ROC) of 0.84. In Winnyfrida et al,[29] study comparing BAP65, CAUDA70, DECAF, MODIFIED DECAF proved that CAUDA70 scoring is better in predicting mortality. In our study both DECAF, CAUDA70 predicts better in total mortality.

In a study by Maha Yousif et al30 they compared DECAF Score, BAP65 score and 2008 score, they found significant statistical association between mortality and age, Smoking and gender in our study we compared DECAF, BAP65, CAUDA 70, there was no significant association between mortality and age because of small study sample. C. E chevarria et al,[9] found significant relationship between mortality and DECAF score even our study proved the same. R. Moghal et al,[27] compared the study between 2 scores, CAUDA70, DECAF score no of mortalities in DECAF high score is 8(28.6%), in CAUDA70 no of mortalities in high score is 4 (33.3%), increasing level of mortality increases with ascending score, even our study proved the same.

CONCLUSION

Our findings imply that a straightforward clinical prediction tool that incorporates indices that are frequently available at the time of hospital admission will help stratify patients with AECOPD into risk categories that are clinically relevant, which may help clinicians manage these patients. In conclusion, we propose that the DECAF, BAP 65, and CAUDA 70 scores all play a part in clinical practice.

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