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A Study to Evaluate the Role of MDECAF Score on Length of Hospital Stay In Patients Admitted with ECOPD

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Abstract

Background: MDECAF (Modified DECAF) score is an effective clinical prognostic tool in predicting mortality in ECOPD (Exacerbation of COPD) patients. It has five variables, Baseline dyspnea, Eosinopenia, Consolidation, Acidemia, frequency of hospitalizations in last 1 year and categorised into 3 risk groups; low(score 0-2) intermediate(3) and high(4-6). **Aim and objectives:** To predict the LOS (Length of hospital stay) in hospital for ECOPD patients using MDECAF scores. **Methodology:** Observational study from January to June 2023. ECOPD patients who presented to emergency room were assessed using MDECAF and correlated with their LOS in hospital. **Results:** Out of 42 patients, 12(28.57%) were in low risk group with an average LOS of 6 days, 20 (47.61%)were in intermediate risk group with average LOS of 9 days and 10 (23.80%) were in high risk group with an average LOS of 12 days. **Conclusion:** MDECAF score is a reliable prognostic bedside tool in predicting LOS in ECOPD patients, thereby helping physicians for planning long term supportive care.

Key words: Modified DECAF score, Exacerbation of COPD, Length of hospital stay

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Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a heterogeneous lung condition characterized by chronic respiratory symptoms (dyspnea, cough, sputum production) due to abnormalities of the airways (bronchitis, bronchiolitis) and/or alveoli (emphysema) that cause persistent, often progressive, airflow obstruction[1].

An exacerbation of chronic obstructive pulmonary disease (ECOPD) is defined as an event characterized by increased dyspnea and/or cough and sputum that worsens in < 14 days which may be accompanied by tachypnea and/or tachycardia and is often associated with increased local and systemic inflammation caused by infection, pollution, or other insult to the airways[1].

COPD is a leading cause of morbidity and mortality worldwide and results in an economic and social burden. Prognostic research in exacerbations needing hospitalisation has been

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limited. There seems to be considerable difference in the prognostic factors in exacerbation and stable COPD.

There are multiple scoring systems for stable COPD like BODE index[2] and CAT score[3]. But for evaluation of ECOPD, prognostic markers are not well developed. Steer *et al.* developed the DECAF scoring system consisting of Dyspnea, Eosinopenia, Consolidation, Acidemia and Atrial Fibrillation for assessing risk of in hospital mortality in ECOPD patients[4].

Modified DECAF score (MDECAF) according to Mohamed H Zidan *et al.*[5]is simple to calculate and apply at the bedside and is more sensitive and specific prognostic tool in predicting mortality in ECOPD patients. It requires an assessment of the patient's usual level of breathlessness and functions. In MDECAF Frequency of hospitalization in last one year is taken instead of Atrial Fibrillation. Patients with frequent exacerbations requiring hospital admissions are at higher risk of mortality especially those with 2 or more exacerbations per year in a study by Hurst *et al.*[6].MDECAF consists of following variables.

MDECAFVariables	**Score**
Dyspnea limiting the patient to home (eMRCD 5) and independent in bathing and dressing (eMRCD 5a)	1
Requires assistance in bathing and dressing (eMRCD 5b)	2
Eosinopenia (<50 cells/mm3)	1
Consolidation (on chest x-ray)	1
Acidemia (pH < 7.30)	1
Frequency of hospitalizations in last 1 year (2 or more)	1
Total Score	6
*eMRCD: Extended Medical Research Council Dyspnea Score.	

Modified DECAF score consisting of five parameters (Baseline Dyspnea, Eosinopenia, Consolidation, Acidemia, and Frequency of hospitalization on last one year) with a total score of 6 is a clinical predicting tool for mortality in patients with ECOPD. Extended Medical Research Council Dyspnea (eMRCD)[7] score refers to baseline dyspnea that is, the level of activity on a good day within the last three months.

eMRCD score

Limitation due to breathlessness	**Score**
Breathless only with strenuous exercise	1
Breathless when hurrying on the level or walking up a slight hill	2
Walks slower than peers, or stops when walking on the flat at own pace	3
Stops after walking 100m, or for a few minutes, on the level	4
Too breathless to leave the house	5
And independent in washing and/ or dressing	5a
And dependent in washing and dressing	5b

According to Modified DECAF score, patients with ECOPD are divided into 3 risk groups:
Low risk group (score 0-2)
Intermediate risk group (score 3)
High risk group (score 4-6)

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Aim

To study the role of modified DECAF score in predicting length of hospital stay (LOS) in patients admitted with ECOPD.

Objectives

To assess patients according to MDECAF risk categories
To assess LOS of patients in these risk groups.

Materials and methods

This is an Observational study conducted in the Department of respiratory medicine, ASRAM HOSPITAL, ELURU from January 2023 to June 2023. Patients presenting to emergency room and later admitted in Respiratory Medicine department for exacerbations of COPD were studied.

Inclusion Criteria

Patients who were previously diagnosed as COPD (as per GOLD Guidelines) and in exacerbation at the time of admission.
Patients more than 40 years of age
Patients who gave consent.

Exclusion Criteria

Primary reason for admission other than exacerbation of COPD.
Patients with malignancy
Patients on home NIV / LTOT support
Death during hospitalization.

In these patients detailed history is taken and clinical examination done. MDECAF score for these patients was calculated, and categorized according to three risk groups. Length of hospital stay was recorded in each patient.

Results

Age

Out of 42 cases taken in the study, patients in age group of 41 – 50 years were6(14.28%), in age group of 51 – 60 years were 17 (40.47%), in age group of 61 – 70 years were 9(21.42%), in age group 71 – 80 years were 7 (16.66%) and 3 patients (7.14%) were above 80 years. The mean age in this study was 58.9 years.

Gender

32 (77%) patients were male and 10 (23%) were females.

Smoking status

36 patients were smokers and 6 were non-smokers, but biomass fuel exposure is present in these patients.

MDECAF score

Patients with MDECAF score 0-2 that is low risk group patients were 12 (28.57%). Patients with score 3 that is intermediate risk group were 20(47.61%). Patients with score 4-6 that is high risk group were 10(23.80%).

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 11, 2023

Distributions of the patients according to MDECAF variables

Out of the total 42 patients, patients with eMRCD 5a were 22 (52.38%) and with eMRCD 5b were 10 (23.80%). Patients with eosinopenia (<50 cells/mm^3) were 35 (83.33%). Patients presenting with consolidation were 28 (66.66%). Patients with acidemia (pH < 7.30) were 10 (23.80%). Patients with history of 2 or more hospitalizations in last year for ECOPD were 3 (7.14%).

Table 1: Distribution of the patients according to MDECAF variables:

MDECAF variable	MDECAF score	Number of patients	Percentage%
eMRCD 5a	0	10	23.80%
	1	22	52.38%
eMRCD 5b	2	10	23.80%
Eosinopenia	0	7	16.66%
	1	35	83.33%
Consolidation	0	14	33.33%
	1	28	66.66%
Acidemia	0	32	76.19%
	1	10	23.80%
Frequency of hospitalizations in last 1 year (2 or more)	0	39	92.85%
	1	3	7.14%

Length of hospital stay (LOS)

Average LOS for patients in low risk group was 6days, in intermediate risk group was 9 days and in high risk group is 12days. 8 patients in high risk group were on noninvasive ventilation (NIV) and 2 patients were initially intubated and later put on NIV.

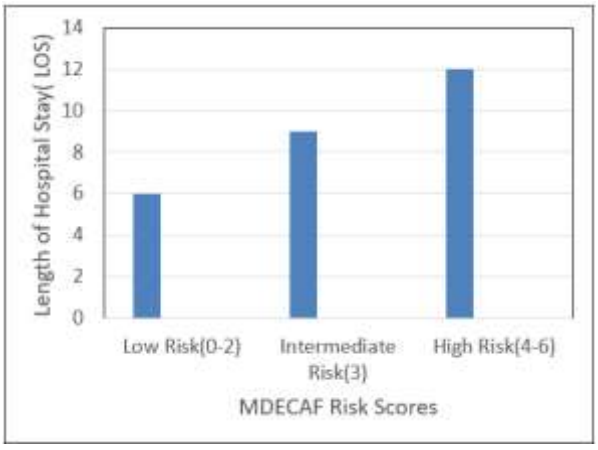

Table 2: MDECAF risk score in relation to LOS

Discussion

According to age wise distribution, patients in age group 51 – 60 years were more than other age groups. There was a predominance of male population in our study which could be attributed to the higher prevalence of smoking among males in our society than the females. Most of the females in our study were non-smokers but had a positive history of biomass fuel exposure as well as passive smoking.

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In our study Intermediate risk group patients were more in number. Most of the patients had 5a eMRCD scoring and eosinopenia. Eosinopenia accompanies the response to acute infection and inflammation. Gil *et al.*[8]found that the presence of leukocytosis along with eosinopenia was significantly associated with the occurrence of bacterial infections. In a study by Holland *et al.*[9] eosinopenia is an independent marker for assessing severity and length of stay in ECOPD patients.

In our study Length of stay is longer in MDECAF high risk category patients. These patients needed support with Non invasive ventilation (NIV) and longer antibiotic therapy. Some of these patients were discharged with advice of long term oxygen therapy and NIV support. According to Sharma *et al.*[10]length of stay for low risk patients is shorter compared to that of other risk groups. Number of ventilator days and NIV days were also longer in high risk groups. Respiratory acidosis being one of the indications for ventilator support in ECOPD, can be provided either by non-invasive or in some conditions may require invasive ventilation also. Longer duration of hospital stay was observed in ECOPD patients with prior history of two or more hospitalizations in the last one year as compared to those with history of not more than one hospital admission in last one year. According to Zidan *et al.*[5] study who compared conventional DECAF and MDECAF, using frequency of hospital admissions is a significantly better prognostic tool for mortality in ECOPD patients compared to atrial fibrillations.

Conclusion

Patients with lower Modified DECAF scores are found to have better prognosis and shorter duration of LOS, but those who have higher Modified DECAF scores are associated with the need for prolonged hospital stay and NIV use. MDECAF score is a reliable prognostic bedside tool in predicting LOS in ECOPD patients, thereby helping physicians for planning management and counselling the patients on prognosis, duration of hospitalization, need for NIV support and also long term supportive care like long term oxygen therapy and domiciliary NIV support.

References

1. Global Initiative for Chronic Obstructive Lung Disease. Global strategy for prevention, diagnosis and management of COPD: 2023 report. Global Initiative for Chronic Obstructive Lung Disease; 2023. Available from: https://goldcopd.org/2023-gold-report-2/. Google Scholar
2. Celli BR, Cote CG, Marin JM, Casanova C, Montes de oca M, Meindez RA, *et al.* The body-mass index, airflow obstruction, dyspnea, and exercise capacity index in chronic obstructive pulmonary disease N Engl J Med. 2004;350:1005–1012
3. Bansode PM, Kumar C, M S. Usefulness of Cat Score in Patients with Stable Copd and Acute Exacerbation of Copd and it's Co-Relation with PFT. J Assoc Physicians India. 2022 Apr;70(4):11-12. PMID: 35443452.
4. Steer J, Gibson J, Bourke SCThe DECAF Score: predicting hospital mortality in exacerbations of chronic obstructive pulmonary diseaseThorax 2012;67:970-976.
5. Zidan, Mohamed, Heba Said Gharraf and Basma Wahdan. "A comparative study of DECAF score and modified DECAF score in predicting hospital mortality rates in acute exacerbation of chronic obstructive pulmonary disease." *The Egyptian Journal of Chest Diseases and Tuberculosis* 69 (2020): 532 - 541.
6. Hurst, J. R. , Vestbo, J. , Anzueto, A. , Locantore, N. , Müllerova, H. , Tal-Singer, R. , Miller, B. , Lomas, D. A. , Agusti, A. , MacNee, W. , Calverley, P. , Rennard, S. ,

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 11, 2023

Wouters, E. F. & Wedzicha, J. A. (2010). The New England Journal of Medicine, 363 (12), 1128-1138. doi: 10.1056/NEJMoa0909883.

7. Steer J, Norman EM, Afolabi OA, Gibson GJ, Bourke SC.Dyspnoea severity and pneumonia as predictors of in-hospital mortality and early readmission in acute exacerbations of COPD. *Thorax* 2012;**67:**117-121.
8. Gil H, Magy N, Mauny F, Dupond JL. Value of eosinopenia in inflammatory disorders: An "old" marker revisited Rev Med Interne. 2003;24:431–5
9. Holland M, Alkhalil M, Chandromouli S, Janjua A, Babores M. Eosinopenia as a marker of mortality and length of stay in patients admitted with exacerbations of chronic obstructive pulmonary disease Respirology. 2010;15:165–7
10. Sharma, Sushant; Khan, Kalim; Yadav, Gulab Singh; Koolwal, Suresh. A Study of Modified Decaf Score in Predicting Hospital Outcomes in Patients of Acute Exacerbation of Chronic Obstructive Pulmonary Disease at SMS Medical College, Jaipur. Advances in Human Biology 10(3):p 171-175, Sep–Dec 2020. | DOI: 10.4103/AIHB.AIHB_35_20
11. Hurst, J.R., Han, M.K., Singh, B. *et al.* Prognostic risk factors for moderate-to-severe exacerbations in patients with chronic obstructive pulmonary disease: a systematic literature review. *Respir Res* **23**, 213 (2022). https://doi.org/10.1186/s12931-022-02123-5