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Decaf Score in Acute Exacerbation of COPD.

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Abstract

Background

AECOPD is an acute event characterized by the worsening of the patient's symptoms that is beyond normal day-to-day variations and leads to a change in medication. Exacerbations accelerate the rate of decline of lung function and are associated with significantly high mortality.

Most patients with AECOPD have a severe exacerbation and need hospitalization and may require Intensive care and mechanical ventilation if respiratory failure is present. In such situations, assessing the severity of Exacerbation is mandatory to guide decisions regarding the degree of care.

Objectives

To compare DECAF and CURB 65 in predicting outcomes of acute exacerbation of COPD patients.

Materials and methods

The study will be conducted on all patients with COPD visiting to OPD/ emergency department in the Department of General Medicine, ESIC MC & PGIMSR, Rajajinagar, Bangalore 560010.

Sample Size

The sample size was calculated based on the previous study by Ahmed et al.

It was found that the sensitivity of DECAF was 67.65% as compared to 64.71% for CURB-65. In the present study sample size was calculated using a sensitivity of 67.65% margin of error of 12% and a prevalence of AECOPD 38.8% for predicting mortality, the minimum required sample size was estimated to be 156 patients with AECOPD.

Results

The study was conducted on 160 patients with Acute exacerbation of COPD. The results showed mid-age and younger age groups at risk and hospitalizations unlike previously thought.

Strengths

This study is concerned with the prediction of prognosis as well as outcomes of AECOPD with comprehensive prognostic indicators using simple investigations that are

easily available at any healthcare facility. Secondly, the study assessed the high-risk groups of AECOPD patients, using DECAF scoring. Thirdly, the data from the study will be useful for other research studies and in Emergency departments for clinical decision-making.

Summary

The prospective cross-sectional study was conducted on all patients with COPD visiting OPD/emergency department in the Department of General Medicine, ESIC MC & PGIMSR, Rajajinagar, Bangalore 560010, from March 2021 to August 2022. Sample size was estimated to be 156 patients with AECOPD. The mean DECAF Score was 0.56 ± 0.97 and CURB-65 Score was 2.94 ± 1.00.

A study of decaf score in predicting the outcomes of acute exacerbation of COPD patients

An acute exacerbation of chronic obstructive pulmonary disease (AECOPD) is a clinical diagnosis made when a patient with COPD experiences a sustained (e.g., 24–48 h) increase in cough, sputum production, and/or Dyspnea. Although there is no universal agreement on how to define or diagnose AECOPD, they are commonly defined as acute events with worsening respiratory symptoms beyond normal day-to-day variations.

It is estimated that every year 22%–40% of all patients with COPD experience at least one moderate or severe exacerbation, while 9%–16% experience more than one.[1,2] As a result, exacerbations are responsible for one in eight emergency hospital admissions in the UK; an enormous number, considering that the 3-month mortality rate of a hospitalised exacerbation exceeds 15%.[3-5] Patients experiencing frequent exacerbations have worse quality of life, accelerated lung function decline and are at increased risk of future exacerbations, myocardial infarctions, cerebrovascular events and mortality.[6] The prevalence ranged between 2 and 22% among the men and 1.2 to 19% among women in different population-based studies across India [7].

AECOPD may be triggered by respiratory viral and bacterial infection; pollution or ambient temperature may also initiate or amplify AECOPD.[8] Characterized by increased systemic inflammatory activity, AECOPD has a negative impact on patients' health status and out comes [9-11].

The clinical manifestations of exacerbations of COPD are highly variable. Patients with AECOPD may present with symptoms and signs similar to those at baseline except with greater severity. Orthopnoea and paroxysmal nocturnal Dyspnea that are usually not present at baseline may become evident when congestive heart failure coexists. On physical examination, there may be increased expiratory wheezes and rhonchi.

Breath sounds or wheezing may decrease if the airway obstruction is severe. There is usually more prominent use of accessory muscle. Signs of muscle fatigue, such as paradoxical breathing (an inward motion of the upper abdominal wall with inspiration) and respiratory alternans (a cyclic alternation between abdominal and rib cage breathing), may be present and should raise suspicion of impending respiratory failure.

With AECOPD, cough may become more severe and strenuous. Sputum volume may increase, and the color of the sputum may change from whitish to yellow or green. Haemoptysis is not uncommon during AECOPD and may consist of streaks or specks of blood mixed in purulent sputum. Occasionally, hemoptys is may be of larger quantity. In this case, other causes, including lung cancer, pneumonia, bronchiectasis, and heart failure, should be considered.

The severity of AECOPD without respiratory failure can be classified according to several staging systems. The traditional system uses the Winnipeg criteria, which were derived from a double-blind, placebo-controlled trial that evaluated the role of antibiotics in patients with COPD with acute exacerbations.[12] The three-stage system is based on three principal symptoms: increase in sputum volume, increase in sputum purulence, and increase in shortness of breath. This staging system correlates well with the effectiveness of antibiotic treatment for AECOPD.

The Winnipeg criteria

Type of Exacerbations	Criteria
Type 1	All three of the following symptoms: increase in sputum volume, increase in sputum purulence, increase in shortness of breath
Type 2	Any two of the following symptoms: increase in sputum volume, increase in sputum purulence, increase in shortness of breath
Type 3	Any one of the following symptoms: increase in sputum volume, increase in sputum purulence, increase in shortness of breath, plus at least one of the following: upper respiratory tract infection lasting 5 d, fever; increase in wheezes, increase in cough, increase in heart rate ⩾ 20%

The Canadian Medical Association recently published guidelines for the management of AECOPD based on a five-stage severity system.[13] The system grades the severity based on the classic Winnipeg criteria and some of the factors known to correlate with poorer response to therapy, including age greater than 65 years, significant comorbid illness, FEV1 less than 50% of predicted, and number of exacerbations per year. The antibiotic therapy is adjusted according to the severity of the exacerbation. Another three-level staging system for AECOPD has been proposed that incorporates symptoms criteria and history of the disease and comorbidity.[14]

The CURB-65 score was derived and validated first time by Lim et al. based on 1068 patients from three prospective studies in the UK, New Zealand, and the Netherlands [15]. A 6-point score, one point for each of confusion, urea >7 mmol/l, respiratory rate ≥30/min, low systolic (<90 mm Hg) or diastolic (≤60 mm Hg) blood pressure, age ≥65 years (CURB-65 score) following initial hospital assessment data, enabled patients to be stratified according to increasing risk of mortality: score 0, 0.7%; score 1, 3.2%; score 2, 3%; score 3, 17%; score 4, 41.5% and score 5, 57%.

Steer et al., in 2010, developed a comprehensive score to predict the risk of in-hospital mortality in AECOPD called the DECAF score [16]. DECAF consists of five parameters: Dyspnea (D), eosinopenia (E), consolidation (C), academia (A), and atrial fibrillation (F). DECAF is a simple tool that can be administered at the bedside using indices routinely available on admission. Administering DECAF in severely ill patients can help to predict mortality. Identified high-risk patients must be closely monitored with efficient and timely medical interventions to help reduce the overall mortality rate. In

their study they compared DECAF and CURB 65score in predicting in hospital mortality.

Keywords: AECOPD, FEV_1, AF, ICU, AATD

Conclusions

The study was conducted on 160 patients with Acute exacerbation of COPD. The results showed mid age and younger age groups at risk and hospitalizations unlike previously thought. Routine blood tests and chest Xray imaging which are simple, convenient and easy accessible tools are still of diagnostic importance as there were many changes noted through the use of these simple yet effective tools. Higher DECAF scores were noted in older age groups in the study. Guidelines on management of this vulnerable elderly population and patient care would reduce the mortality risk. The DECAF score system was found to have significant association in predicting the outcomes in the AECOPD patients.

Strengths

This study concerns with the prediction of prognosis as well as outcomes of AECOPD with comprehensive prognostic indicators using the routine blood investigations, Chest Xray Imaging, which are easily available at any healthcare facilities. Secondly, the study assessed on the high-risk groups of Acute COPD patients, using the superior mortality risk predictor score system, i.e DECAF scoring. Thirdly, the data from the study will be useful for other research studies and also in emergency departments for clinical decision making and to be prepared with appropriate level of care so as to manage these high-risk population group for a safe discharge and reducing the deaths.

Limitations

In the study, there was a wide age range. The causal and the risk factors may be different for definite age groups. Considering the wide age range, a larger sample size with equal distribution of the population would create a stronger impact of the study. Also, the study was conducted at a single tertiary centre at a single point of time. So, generalizing the results would not be possible. Long term follow up is required to note the outcome of the discharged patients, as occurrence of re-exacerbations after discharges is not uncommon. Longitudinal study of minimum of two years, with a larger sample size would fill this research gap.

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