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RESEARCH ARTICLE / ÖZGÜN ARAŞTIRMA

Predicting Hospitalization, Exacerbation and Mortality in Bronchiectasis Using Bronchiectasis Severity İndex and FACED Scores

Bronşektazi Şiddeti İndeksi ve FACED Skorlaması Kullanılarak Bronşektazide Hastaneye Yatış, Alevlenme ve Mortalite Öngörüsü

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ABSTRACT

Objective: Bronchiectasis (BC) is a multifaceted and etiologically diverse condition and, as a result, no single endpoint can be used to determine its general severity and prognosis. Two different validated scores are currently being used to evaluate the seriousness bronchiectasis: The bronchiectasis severity index (BSI) and the FACED score. It is aimed at comparing the bronchiectasis severity assessment questionnaires whichs are two different validated outcomes for mortality, exacerbation, and hospitalizations.

Material and Methods: Medical records for 107 subjects with NCFB, for which BSI and FACED scores could be calculated, were reviewed retrospectively. The correlations between the parameters and the BSI or FACED score were evaluated and a linear regression analysis was conducted to identify the independently associated variables of the BSI and FACED score.

Results: The mean scores of FACED and BSI were 3.5±1.9 and 9.8±4.7, respectively. A statistically significant relationship was found between the FACED and BSI scores ($p<0.0001$), Pearson Chi-square ($p=0.0001$), and tau-b de Kendall (0.59; $p=0.0001$). It was showed a 60.7% similarity between the two scales by Kappa test ($p<0.0001$). BSI and FACED reported an area under ROC curve (AUC) for exacerbations of 0.758 and 0.755; and for hospitalizations (due to BE exacerbations) of 0.864 and 0.597, respectively. The sensitivity of the BSI is higher (86% versus 59%) than the FACED rating.

Conclusion: Patients tended to obtain a higher BSI score relative to the FACED score, although the correlation between the two scales was statistically significant. BSI is a helpful clinical predictor tool for identifying patients at risk of death, hospitalization, and exacerbation in health-care systems.

Keywords: Bronchiectasis, exacerbation, mortality, prediction.

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ÖZ

Amaç: Bronşektazi çok boyutlu ve etyolojik olarak farklı bir hastalıktır ve sonuç olarak, genel şiddetini ve prognozunu belirlemek için tek bir referans kullanılamaz. Bu çalışmada, mortalite, alevlenme ve hastaneye yatışlar için doğrulanmış iki farklı sonuç olan bronşektazi şiddeti değerlendirme anketlerinin [Bronşektazi Şiddeti İndeksi (BSI) ve FACED] karşılaştırılması amaçlandı.

Gereç ve Yöntemler: BSI ve FACED puanlarının hesaplanabildiği nonkistik fibrozis bronşektazili 107 denek için tıbbi kayıtlar geriye dönük olarak incelendi. Parametreler ile BSI veya FACED skoru arasındaki korelasyonlar değerlendirildi ve BSI ve FACED puanının bağımsız olarak ilişkili değişkenlerini tanımlamak için doğrusal bir regresyon analizi yapıldı.

Bulgular: FACED ve BSI ortalama puanları sırasıyla 3,5±1,9 ve 9,8±4,7 olarak belirlendi. FACED ve BSI skorları arasında istatistiksel olarak anlamlı bir ilişki bulundu (p<0,0001). Pearson Chi-Square (p=0,0001), tau-b de Kendall (0,59; p=0,0001). Kappa testi ile iki ölçek arasında %60,7 benzerlik gösterildi (p<0,0001). Alevlenmeler için BSI ve FACED, 0,758 ve 0,755 ROC eğrisi (AUC) bir değer gösterdi; hastane yatışı için ise sırasıyla 0,864 ve 0,597 değerleri tespit edildi. BSI'nın duyarlılığı FACED derecelendirmesinden daha yüksektir (%86'ya karşı %59).

Sonuç: İki ölçek arasındaki korelasyon istatistiksel olarak anlamlı olmasına rağmen, hastalar FACED skoruna göre daha yüksek bir BSI puanı alma eğilimindeydi. BSI, sağlık sistemlerinde ölüm, hastaneye yatış ve alevlenme riski olan hastaları tanımlamak için yararlı bir klinik tahmin aracıdır.

Anahtar kelimeler: Alevlenme, bronşektazi, mortalite, tahmini değerlendirme.

INTRODUCTION

Bronchiectasis (BC) is a chronic respiratory disease with an abnormally permanent expansion of bronchi and bronchioles resulting in a deficiency of host defense, chronic bacterial colonization, and respiratory tract inflammation with progressive bronchial injury.[1,2] Bronchiectasis is associated with long-term hospitalizations and high mortality, resulting in considerable economic burdens.[3]

An evaluation of the seriousness of the disease in bronchiectasis is required for better treatment outcomes. Clinical decisions are based on the accurate identification of patients with a high risk of mortality, hospitalization, and exacerbation. Although several individual variables have been used in the assessment of the severity of non-cystic fibrosis bronchiectasis (NCFB), it is difficult to assess bronchiectasis alone due to the absence of a valid and simple measurement method. However, FEV_1 was not effective for clinical decision making, HRCT scores correlated with pulmonary function was weak.[4]

As a result, multi-dimensional scores including demographic, microbiological, radiological, and clinical data were recently developed and validated as a useful tools to better assess the severity and prognosis of the disease. Two multi-dimensional rating systems have been created and validated to categorize NCFB severity: The bronchiectasis severity index (BSI) and the FACED scores. The FACED score is a five-point evaluation system that estimates mortality in 5-year follow-up patients.[5] BSI is quite complex, assessing nine variables with different point values for identifying patients at risk of death, hospitalization, and exacerbations.[2] Both attribute points according to age, expected FEV_1% value, presence of chronic colonization by *Pseudomonas aeruginosa*, radiological extent, and type of bronchiectasis and degree of dyspnea. BSI also takes into account body mass index, frequency of exacerbation, previous hospitalization for severe exacerbation, and chronic colonization by non-*P. aeruginosa*. Exacerbations are chance events that play a significant role in treatment and the patient as a quality of life and are associated with health-care costs. Improved prediction of exacerbations can inform clinicians involved in their prevention and, as a result, reduce hospitalizations and the worst outcomes. Our objective was to identify all patients to evaluate the relevant clinical results of the disease in patients with NCFB and to identify risk factors for mortality and morbidity.; comparison of NBCF severity assessment results using FACED, E-FACED, and BSI notes. Are there any similarities between the paired groups between these scorings?

MATERIAL AND METHODS

This was a single-center retrospective research of population and clinical information from a practical sample of NCFB patients who attended Ankara Ataturk Sanatory Training and Research Hospital. The study protocol was approved by the Institutional Review Board and Ethics Committee (reference no/date: 2012-KEAK-15/2538/28.06.2022). Patients recruited from 15 April 2019 to 15 April 2020. There are 107 patients (23 female and 84 male) between the ages of 33 and 92. The inclusion criteria were as follows: At the time of the clinical evaluation, all patients were clinically stable and had not used any antibiotics during the previous 4 weeks. Bronchiectasis has been diagnosed with high-resolution chest computed tomography (CT) scan.[6] Basic demographic characteristics and clinical variable data, obtained to calculate BSI and FACED scores, included age, body mass index, FEV_1, Medical Research Council modified dyspnea score, radiological appearance of enlarged bronchial tubes (cylindrical vs. varicose vs. cystic), number of affected lobes; colonization by Pseudomonas; colonization by other organisms; number of hospitalizations; and number of exacerbations. These population were consisted of patients with bronchiectasis. Exacerbations and hospitalizations were recorded for 12 months. Hospitalization for severe exacerbations were defined according to BTS (British Thoracic Society) guidelines.[6] Comorbidities and laboratory values, including white blood cell count, hematocrit and serum hemoglobin, protein, albumin, uric acid, and C-reactive protein levels reactive also have

been achieved. The study excluded patients with coexistence of active malignancy, cystic fibrosis, HIV, non-tuberculous mycobacteria, primary diagnosis of pulmonary fibrosis/sarcoidosis, secondary traction bronchiectasis, and those who received long-term antibiotic treatment for a given time before the start of the study. All patients were assessed for the variables included in the BSI and FACED scores at the final appointment. Patients were categorized based on the severity thresholds outlined in the original literature.

BSI Score

The nine parameters for BSI are age, body mass index (BMI), 1-s forced expiratory volume (FEV_1) % expected, hospitalization with severe exacerbation in the past 2 years, number of exacerbations in the previous year, the score of the Modified Medical Research Council (mMRC), pseudomonas colonization, colonization of other organisms, and radiological seriousness (≥3 lobes involved or cystic bronchiectasis). These scores rank patients in mild (0–4 points), moderate (5–8 points) and severe (9 points and above) groups and identify patients at risk of death, hospitalization, and exacerbation.[4]

The FACED Score[5]

The scores include five dichotomous variables. Total scores are calculated by adding the scores of each variable and can vary from zero to seven points. This score classifies bronchiectasis into three categories of seriousness: Mild bronchiectasis (overall score zero to two points), moderate bronchiectasis (overall score three to four points), and severe bronchiectasis (overall score five to seven points).

Analysis of Patient Samples

The severity of shortness of breath was evaluated using mMRC[7] in 5: Level 0 (the patient is not disturbed by shortness of breath unless exercising intensively), level I/(short breathing when hurrying on the level or while climbing a slight hill), level II/(walking slower than most people of the same age due to shortness of breath or having to stop breathing after walking 15 min at one's own pace), level III (stop breathing after you have walked about one hundred meter or after a few minutes on flat ground), and level IV (too shortness of breath when leaving home or shortness of breath when undressing).

Spirometry[8] has been carried out in accordance with ERS/ATS standards. Spirometry results are expressed in predicted percent. All bacteriological analyses were carried out on samples of spontaneous expectorations early in the morning, as described above. Chronic colonization has been defined as the isolation of potentially pathogenic bacteria from sputum culture on twice or several times, at least 3 months interval over a 1-year period. The dominant pathogen used to be the most produced organism. Patients have been requested to provide sputum specimens a minimum of 2 times per year during clinical examinations.[9,10] The radiological severity of bronchiectasis was assessed with a modified Reiff score that evaluated the number of affected lobes (with the lingula seen as a single lobe) and the degree of dilatation (tubular=1, varicose=2, and cystic=3).[11] Hospitalization for severe acute exacerbations was determined in accordance with guidance from the British Thoracic Society.[6] Exacerbations were defined based on the BTS definition as acute impairment with increased sputum volume and purulence and/or systemic disruption.[6] Patients were categorized based on the frequency of exacerbations per year during follow-up into two groups (low-EXAC (exacerbations): <2/year and high-EXAC: ≥2/year). As a result, our main outcome has been patients who have ≥ two exacerbations each year in follow-up (high-EXAC). Hospitalizations resulting from BE exacerbations were also assessed.

Table 1: Characterization of study participants

Characteristics	Sample (n=107)	
	n	%
Age*(years)	66±12	
Gender		
Male	84	
Female	23	
BMI (kg/m²)	26.6±5.9	
Dyspnea mMRC**	2.4±1	
FEV_1% predicted	48.1±20.1	
Pseudomonas aeruginosa colonization	7	6.5
Colonization with other microorganisms		17.8
Number of affected lobes (≥3 lobes)		78.9
Exacerbations in previous year	81	75.0
Hospital admission due to bronchiectasis in the previous 1 years		35.5
BSI score***	9.8±4.7	
FACED score***	3.5±1.9	

*Mean±SD, **Median, ***Fisher's exact test (p<0.001) and tau-b Kendall test (0.677; p<0.001) between FACED and BSI scores. BMI: Body mass index, FEV_1: Forced expiratory volume in 1 s, BSI: Bronchiectasis severity index.

Statistical Analysis

Descriptive statistics of mean and SD were used for continuous variables. Parametric statistics were used to confirm the normal distribution of data using the Kolmogorov-Smirnov test. For the categorical variables, we obtained absolute frequencies and percentages relative to total and conditioning. Statistical data processing was conducted through the Microsoft Excel® and IBM SPSS® v23 programs. Comparisons between two groups were conducted using the unpaired t-test, the Mann-Whitney U-test, or the Chi-square test, depending on the distribution of the data. We used Cohen's Kappa(k) coefficient to measure concordance among the classification of the severity of scores. The yield of the resulting model for mortality, exacerbation, and hospital admissions was assessed using the area under curve (AUC). Statistical significance was determined to p<0.05.

RESULTS

Data were collected from 117 patients diagnosed with bronchiectasis and excluded ten patients with different variables, the remaining 107 patients (92%) for testing. The study patients' characteristics are described in Table 1. The outcome variables FACED and BSI are illus-

Table 2: Values of FACED score variables

Variables	n (%)
FEV_1% predicted	
≤50%	60
>50%	40
Age (years)	
>70	62
≤70	38
p. aeruginosa colonization	
Yes	7
No	93
Radiological extension of the disease	
>2 involved lobes	87
≤2 involved lobes	13
Dyspnea-mMRC	
>II (III and IV)	46
≤II (0–II)	54

FEV_1: Forced expiratory volume in 1 s, mMRC: Modified medical research council

Table 3: Values of BSI score variables

Variables	n (%)
Age (years)	
<50	9
50–69	22
70–79	30
≥80	37
Body mass index (BMI)	
≥18.5	93
<18.5	7
FEV_1% predicted	
>80%	8.3
50–80%	34.3
30–49%	38.9
<30%	17.6
Hospitalization preceding 1/year	
No	61
Yes	39
Exacerbations in previous year	
0–1	24
≥2	76
Dyspnea-MRC scale	
0–2	43
3	28
4	29
Pseudomonas aeruginosa colonization	
No	93
Yes	7
Colonization with other microorganisms	
No	82
Yes	18
Radiological severity (more than 3 lobes involved or cystic BC)	
No	12
Yes	88

BSI: Bronchiectasis severity index, mMRC: Modified medical research council, FEV_1: Forced expiratory volume in 1 s, mMRC: Modified medical research council.

trated in Tables 2 and 3 (respectively). FACED score were found 37 patients (34.3%) with mild BC, 41 patients (38%) with moderate, and 29 patients (26.9%) with severe BC. The frequency of low, medium, and high BSI cases was 16 (14.8%), 32 (29.6%), and 59 (54.6%), respectively, in relation to derived.

A moderate and statistically significant relationship between the FACED and BSI scores was also identified with Fisher's exact test (p=0.0001) and tau-b de Kendall (0.59; p=0.0001).

This test revealed a similarity of 60.7% (65 equations/107=0.60) between the two scales. It was established 68.1% similarity between the two scales using Cohen's Kappa test. (κ=0.42, p<0.0001) (Table 4).

BSI and FACED Compared for Low-EXAC and High-EXAC Patients

Overall, during the previous year, 26 patients (24.1%) had no exacerbations, 25 (23.1%) had an exacerbation, and 56 (51.9%) had two or more exacerbations. In patients who experienced one or more exacerbations during follow-up, 50% (41 of 81) were hospitalized. As a result, we have divided our patients into two groups, as outlined in the procedures: Low-EXAC 25 patients (30.8%) and High-EXAC 56 (69.1%).

The frequency of the different components of the FACED and BSI scores between Low-EXAC and High-EXAC patients was compared (Table 5). For FACED, statistically significant differences were found for chronic bronchial infection with FEV_1%, colonization of *P. aeruginosa*, age, CT extension, and dyspnea components between low-EXAC and high-EXAC. For BSI, significant group differences were observed in chronic bronchial infection by *P. aeruginosa* colonization, MRC, age, Components of radiation severity (as in FACED), and of two additional components not included in the FACED score: previously hospitalization and previously exacerbations. Chronic bronchial infection with *P. aeruginosa* was detected 6% of the patients. Mean FACED and E-FACED scores were 3.5±1.9 and 9.8±4.7, respectively.

Table 6 shows the outcome of the logistic regression analysis, including as independent variables the five dichotomized variables which would constitute the final score known as FACED. FEV_1 (F, 1.65, OR [95% CI] 5.19 [2.76–9.75], p=0.0001); age (A, 1.61, OR [95% CI] 4.98 [2.67–9.28], p=0.0001); chronic colonization by *P. aeruginosa* (C, 0.86, OR [95% CI] 2.37 [1.28–4.58], p=0.006); extension of bronchiectasis (E, 0.62, OR [95% CI] 1.87 [1.01–3.46], p=0.04), and dyspnea (D, 1.01, OR [95% CI] 2.75 [1.46–5.18], p=0.002).

Table 4: Classification of patients by BSI versus FACED (2A) or Exa-FACED (2B) and FACED versus Exa-FACED (2C) scores

2A				
BSI		**FACED**		**Agreement**
	Mild	**Moderate**	**Severe**	
Mild	16	0	0	Kappa=0.42 (p=0.0001)
Moderate	12	20	0	Concordance 39.3%
Severe	9	21	29	
2B				
BSI		**Exa-FACED**		**Agreement**
	Mild	**Moderate**	**Severe**	
Mild	16	0	0	Kappa=0.31 (p=0.0001)
Moderate	18	14	0	Concordance 47%
Severe	9	24	26	
2C				
FACED		**Exa-FACED**		**Agreement**
	Mild	**Moderate**	**Severe**	
Mild	37	0	0	Kappa=0.87 (p=0.0001)
Moderate	6	35	0	Concordance
Severe	0	3	26	

BSI: Bronchiectasis severity index.

Predictive Performance Evaluations Exacerbations

The discrimination of individual scores in predicting exacerbations (1/year.) or hospitalizations (1/year.) is illustrated in Figure 1. The AUC was 0.75 (95% CI: 0.6–0.85) for BSI and 0.75 (95% CI: 0.66–0.85) for FACED regarding exacerbations (p=0.0001 for BSI vs. FACED) (Fig. 1). Regarding hospitalizations, the AUC was 0.758 (95% CI: 0.663–0.852) for BSI and 0.755 (95% CI: 0.660–0.850) for FACED (p<0.001 for BSI vs. FACED). Again, BSI showed similar sensitivity with FACED (Fig. 2).

Predictive Performance Evaluations Mortality

Figure 1 presents annual AUC ROC for FACED (range 0.43–0.67) and E-FACED scores (range 0.44–0.67) during the 1-year follow-up period. There were statistical differences between the BSI's annual predictive power relative to the FACED/E-FACED scores. The range value of AUC ROC for BSI (0.72–0.89) was different to the range value for FACED and E-FACED (Fig. 3).

DISCUSSION

This retrospective study suggests that BSI is superior to FACED to predict clinically significant disease-related outcomes, including hospitalizations, exacerbations, and mortality in bronchiectasis. The current medical community has two major challenges in bronchiectasis management: (1) Whether bronchiectasis severity tools must be used in clinical practice to guide escalating treatment, they should anticipate the results relevant to such decisions[6] and (2) identification of low-risk patients that may be appropriate for simpler treatment regimens to increase health-care costs and patient satisfaction with bronchiectasis.

At present, two scales are available for assessing the severity and prognosis of BC: FACED and BSI. The use of the FACED and BSI scales presents some benefits and problems. The FACED score is simple to get, calculate, and interpret, because it integrates five dichotomous variables. Moreover, different objectives were used to develop these two scales: while FACED was designed specifically to predict the probability of mortality in the 5-year monitoring period of NCFB of any etiology, this allows the initial severity to be assessed rapidly, BSI was designed to predict death, severe exacerbations requiring hospitalization and frequency of exacerbations. Our results demonstrate that neither the BSI nor the FACED index are excellent predictors exacerbations or hospital admissions in BE patients. However, in our research, BSI had a greater capacity to predict exacerbations than FACED, and particularly, the exacerbations that necessitate hospitalization.

Table 5: The frequency of the different components of the FACED and BSI scores between low-EXAC and high-EXAC patients was compared

Score	Component (points)	Low-exac (n=25)	High-exac (n=56)	p
FACED				
FEV_1	≥50%	54	53	0.05
	<50%			
Age	<70 years	46	21	0.0001
	≥70 years	8	32	
Chronic PA	Yes	2	5	0.05
	No	45	36	
CT extension	1-2 lobes	10	3	0,04
	≥2 lobes	44	50	
Dyspnea	mMRC=0-2	36	21	0.004
	mMRC=3-4	18	32	
BSI				
Age	<50	9	1	0.0001
	50–69	15	9	
	70–79	22	11	
	≥80	8	32	
BMI	<18.5	3	4	0.48
	≥18.5	51	49	
FEV_1%	>80	5	4	0.14
	50–80	24	13	
	30–50	17	25	
	<30	8	11	
Prior hospital admission	No	39	30	0.06
	Yes	15	23	
Prior execerbation	0–2	37	14	0.0001
	≥3	17	39	
MRC	1–3	36	21	0.03
	4	12	18	
	5	6	14	
PA colonization	No	52	48	0.05
	Yes	2	5	
Non-PA colonization	No	47	41	0.14
	Yes	7	12	
Radiological severity	No	20	12	0.03
	>3 lobes or cystic BE	34	41	

Data are expressed as n. *Chi-square test or Fisher's exact test,as appropriate. BSI: Bronchiectasis severity index, FEV_1: Forced expiratory volume in the 1 s, PA: Pseudomonas aeruginosa, CT: Computed tomography, BMI: Body mass index (kg/m²), MRC: Medical Research Council dyspnea scale (score 1–5). mMRC_modified MRC scale (score 1–4). BE: Bronchiectasis.

BSI also demonstrates a higher specificity than FACED, probably because it looks at many different elements in the scoring system. Our findings suggest that BSI is superior in the identification of patients at low risk for mortality, hospitalization, exacerbations, and morbidity that can benefit from primary care or nursing-monitoring, which has the potential to improve access or lower health-care costs and improve patient satisfaction.

What is the relation between the BSI and FACED scoring system? Should the BSI and FACED score be used alone or in an additional way in a clinical setting. A prospective observation study undertaken

Table 6: Predictive capacity for mortality of the different dichotomized variables

Variables	OR	p	B-coefficient
Age>70 years versus ≤70	2.9 (0.99–8.4)	0.50	1.06
mMRC score (3–4 vs. 1–2)	0.12 (0.45–0.36)	0.0001	2.06
Post-Bronchodilator FEV_1 <50 versus ≥50	0.50 (0.18–1.3)	0.17	0.6
Extension >2 lobes versus 1–2 lobes	0.64 (0.13–3.07)	0.58	0.4
Chronic colonization by *Pseudomonas aeruginosa* yes/no	1.08 (0.37–3.1)	0.88	0.8

OR: Odds ratio, mMRC: Modified medical research council, FEV_1: Forced expiratory volume in the 1 s.

by McDonnell et al.[12] (2016), which was developed to compare the predictive usefulness of BSI and FACED in evaluating clinically relevant findings of seven European cohorts with 1612 patients, who showed that both tools accurately predict mortality in bronchiectasis, however that the BSI is higher than FACED in predicting multiple clinically useful results including hospitalizations, exacerbations, respiratory symptoms, quality of life, exercise ability, and decreased lung function. A retrospective report from Ellis et al.[13] (2016) was developed to evaluate the capacity of these scores to predict long-term mortality across a cohort of 91 patients. Major findings include the following: (1) Both rating systems have produced similar predictive potency for mortality with great specificity, (2) according to the area under the receiver operating characteristic curve, there was no statistical difference in the ability to predict respiratory mortality at 5, 10 and 15 years of age, (3) there was a small proportion of patients with inconsistent BSI and FACED scores, and 4) compared to their peers, patients with severe BSI who had a mild FACED score were younger and had improved pulmonary function, lower extensive bronchiectasis, and a higher non-significant body mass index.

In our study, there was a significant association between two scales, because patients tend to have a higher BSI than FACED. This may be due to the fact that BSI (not FACED) evaluates parameters such as hospitalization and exacerbations prior the study, chronic colonization by other microorganisms, and the development of cystic bronchiectasis. The fact that the BSI score carries out a different stratification of the age and level of dyspnea may also be a contributing factor. Dyspnea is generally a variable with high predictive potency in most respiratory tract disease studies, regardless of pulmonary function, and it is also the case with bronchiectasis.[14] It is therefore no surprise that this is an element of our score. The measurement was performed using the mMRC scale.[15] Because mMRC scale is simple and widespread method. The extension of bronchiectasis quantified depending on the number of affected lobes, BMI, the presence of chronic colonization by *P. aeruginosa*, or other colonized microorganisms showed no significant independent predictive power for mortality.

Since it is a multi-dimensional and heterogeneous disease, bronchiectasis is not a disease whose impact is mostly measured in terms of mortality. In this context, while the FACED score has shown predictability in the assessment of bronchiectasis, it does not consider the number or severity of exacerbations for the purpose of assessing the predictability of exacerbations and mortality, a scale,

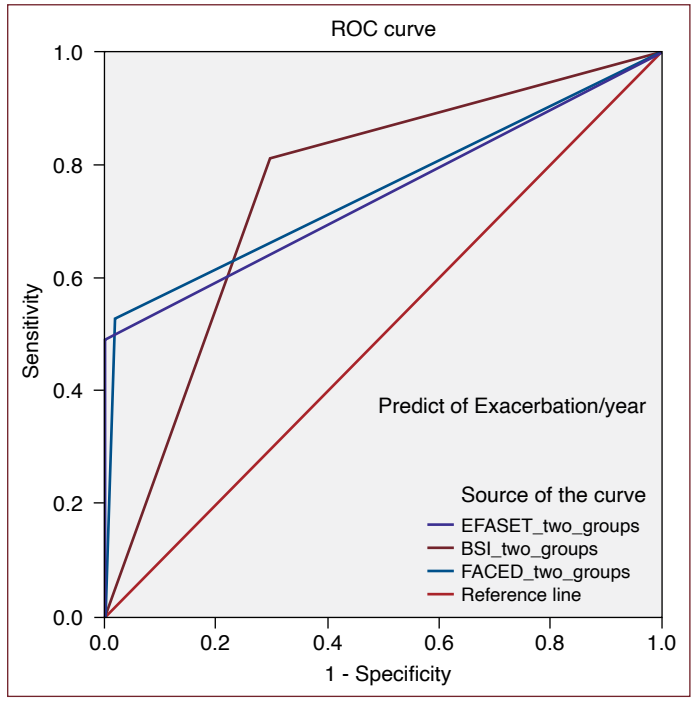

Figure 1: ROC curve for ≥2 exacerbation at 1-year of follow-up.

ROC: Receiver operating characteristic.

E-FACED,[16] has been recently designed and validated. This score considerably enhances the FACED's ability to anticipate future annual exacerbations while keeping the death score simple and predictable.[16] The FACED and E-FACED scores are easy to remember and apply and have been shown to be useful in predicting medium- and long-term mortality in different cohorts across multiple countries.[5,13,16,17] Findings our study indicate that they can also be useful, as can the BSI score, for short-term mortality predictions. This prognosis capability may enhance bronchiectasis management in day-to-day practice and clinical trial scenarios. In daily practice, this short-term prognosis can assist in identifying patients who require more intensive or preventive treatments and to develop personalized management strategies allowing an individualized approach. In terms of the clinical trial scenario, we think that these scores can play an considerable role in the identification of a more specific population that could benefit from specific interventions based on a planned mechanism of action that takes more or less time.[18]

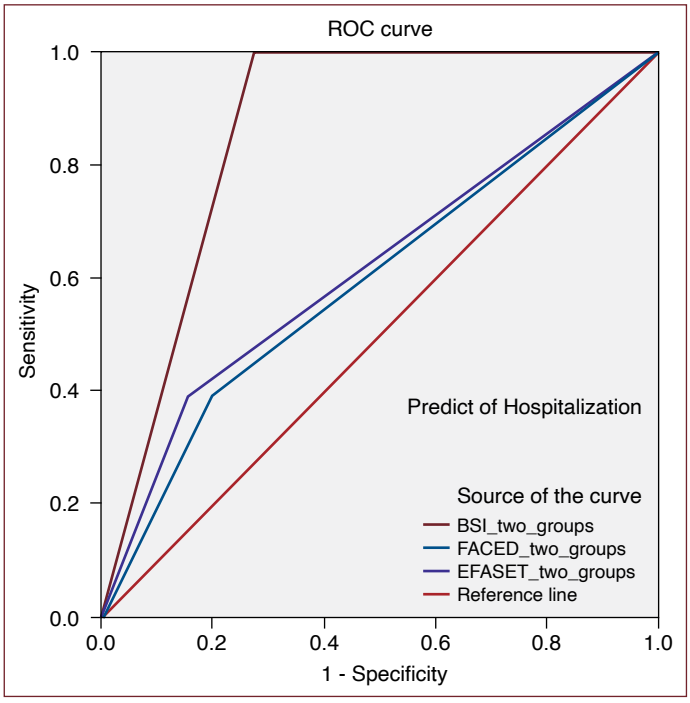

Figure 2: ROC curve for ≥1 hospitalization at 1-year of follow-up.

ROC: Receiver operating characteristic.

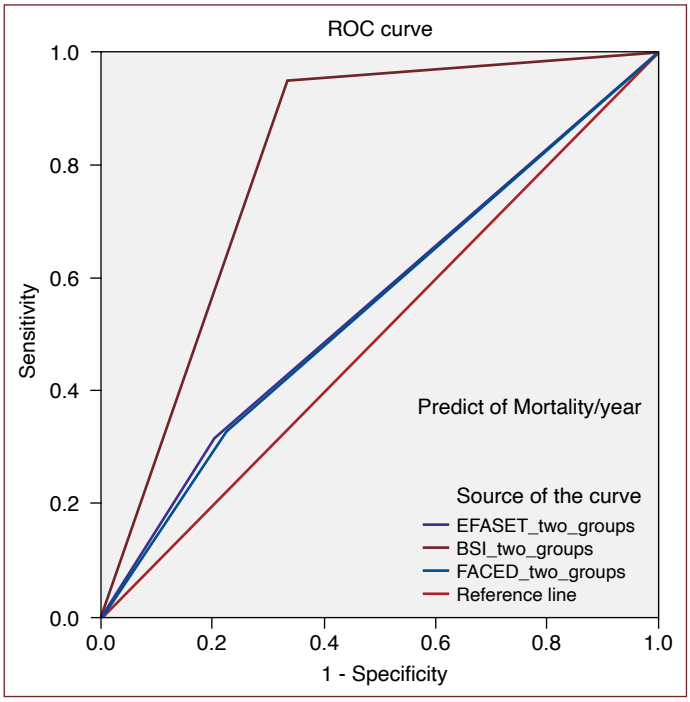

Figure 3: ROC curve for mortality at 1-year of follow-up.

ROC: Receiver operating characteristic.

There are some limitations to this research. First, it is a single-center study involving a relatively small number of patients that may have some impact on the data obtained and how its interpreted. Second, there is no long-term follow-up after a year.

CONCLUSION

The seriousness and prognosis of NCFB cannot be appropriately evaluated using a single variable analysis. Thus, while different, the FACED and BSI scores correspond multidimensional indexes, which allow a precise evaluation of the severity and prognosis of this pathology. BSI is a helpful clinical predictor tool for identifying patients at risk of death, hospitalization, and exacerbation in health-care systems. This may be due to the fact that BSI evaluates parameters such as hospitalization and exacerbations before research. Our findings are similar to those of other studies, which show that the score of age, dyspnea provides an accurate assessment of the severity of the disease to make decisions in terms of identification of high-risk patients who may benefit from aggressive treatment and low-risk patients who may be given non-specialized follow-up or simplified treatment regimens. Further studies should validate our results in different populations of patients with bronchiectasis and evaluate the sensitivity of the two scores to change following therapeutic interventions.

Disclosures

Ethics Committee Approval: The study was approved by The Ankara Ataturk Sanatory Training and Research Hospital Ethics Committee (date: 28.06.2022, number: 2012-KEAK-15/2538).

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