**Respiratory Medicine**

# ASSESSMENT OF BRONCHIECTASIS WITH CORRELATION OF BSI AND SGRQ IN TERTIARY CARE HOSPITAL

| Dr. Chaliki Santoshi Devi | Post Graduate, Department of Respiratory Medicine, Rajahmundry |
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| Dr. G. Divya | Post Graduate, Department of Respiratory Medicine, Rajahmundry |
| Dr. Bandhavi Sayyapureddi | Post Graduate, Department of Respiratory Medicine, Rajahmundry |
| Dr. Somnath Dash | Professor, HOD, Department of Respiratory Medicine, Rajahmundry |

**ABSTRACT** **Introduction:** BRONCHIECTASIS is defined as the abnormal and irreversible dilatation of bronchi, it is a very common lung disorder. Bronchiectasis severity index (BSI) is a multidimensional grading system that classifies the severity of bronchiectasis according to its prognosis and assesses mortality, frequent exacerbations, hospital admissions, and health-related quality of life. The St. George's Respiratory Questionnaire is a self-administered health-related quality-of-life questionnaire containing 50 items and 76 weighted responses measuring patients' quality of life with respiratory morbidity. **Materials and Methods:** The prospective observational study amog 30 patients attending the respiratory medicine department at GSL medical college and general hospital in stable bronchiectasis patients from March 2021 to April 2022. Socio demographic and clinical variables were collected. Patients were subjected to routine blood investigations, HRCT. BSI score and SGRQ score were collected and correlated. **Results:** The mean age in our study 54.6, female were 60% and male were 40%. The mean BSI scores obtained was 8.66. Most of the participants in the study belong to severe bronchiectasis (53.4%) according to BSI severity score. There was a significant correlation between the BSI score and SGRQ score.

## INTRODUCTION

BRONCHIECTASIS is defined as the abnormal and irreversible dilatation of bronchi, it is a very common lung disorder. It is associated with the destruction of bronchial walls and their surrounding supportive tissues. It is idiopathic in many cases. It may also be attributed to prior lung infections, systemic inflammatory disorders, and genetic disorders of first defense.[1]

Bronchiectasis can be congenital or acquired. Congenital is due to developmental defects of the bronchial tree. Acquired can be due to prior infections, aspirations, etc. It usually occurs in older children and adults.

High-resolution computed tomography (HRCT) is the gold standard test for the diagnosis of bronchiectasis. The structural changes in bronchiectasis are the thickening of the bronchial wall, mucus impaction, atelectasis, and air trapping[2].

The pathogenic events in the development of bronchiectasis are infection, inflammation, and the release of inflammatory mediators.

Bronchiectasis are four types- cylindrical, which is characterized by uniform dilatation of bronchi without any tapering. Varicose is characterized by a beaded appearance due to alternating dilatation and constriction of bronchi. Cystic or saccular type is the most severe form characterized by peripheral bronchial dilatation to form large cysts with air-fluid levels. Follicular is characterized by extensive lymphoid follicles within bronchial walls, and this type usually occurs following childhood infections.

Patients with bronchiectasis are frequently colonized by pathogenic organisms. Gram-negative bacteria like pseudomonas aeruginosa are frequently isolated from sputum.

The most common pulmonary function abnormality seen in bronchiectasis is an obstructive airway defect, this can be seen in patients even without a prior smoking history. Patients with bronchiectasis have a higher rate of yearly decline in FEV1. The restrictive defect may be observed with severely advanced disease secondary to fibrosis of lung parenchyma with resultant traction bronchiectasis[3].

Bronchiectasis severity index (BSI) is a multidimensional grading system that classifies the severity of bronchiectasis according to its prognosis and assesses mortality, frequent exacerbations, hospital admissions, and health-related quality of life. Identifying high-risk patients may be very useful to guide clinical decision-making, such as chronic antibiotic therapy and the frequency and intensity of follow-up.

Health-related quality of life (HRQL) measurement scales are objective instruments to directly measure disease's impact on the diseased patient's day-to-day life.

The St. George's Respiratory Questionnaire is a self-administered health-related quality-of-life questionnaire containing 50 items and 76 weighted responses measuring patients' quality of life with respiratory morbidity.

### AIM AND OBJECTIVES

To compare the severity of bronchiectasis by correlating with BSI and SGRQ scores.

### MATERIALS AND METHODS

The prospective observational study among 30 patients attending the respiratory medicine department at GSL medical college and general hospital in stable bronchiectasis patients from March 2021 to April 2022. A proforma was made which includes age, gender, grades of dyspnea, smoking history, number of exacerbations, anthropometric measurements, spirometry, HRCT, sputum cultures, BSI, and SGRQ scores.

The BSI incorporates 9 variables:

1. Age:
a. less than 50 years (0 points); b. 50-69 years (2 points), c. 70-79 years (4 points), d. more than 80 years (6 points)

2. Body mass index (BMI):
a. less than 18.5 (2 points), b. more than 18.5 (0 points)

3. FEV1 % predicted:
a. less than 80% (0 points), b. 50-80% (1 point), c. 30-49% (2 points), d. less than 30% (3 points)

4. Hospital admission in the previous year:
a. no (0 points), b. yes (5 points)

5. Exacerbations in the previous year:
a. 0-2 (0 points), b. 3 or more (2 points)

6. MRC dyspnea score:
a. 1-3 (0 points), b. 4 (2 points), c. 5 (3 points)

7. Pseudomonas aeruginosa colonization:
a. no (0 points), b. yes (3 points)

8. Colonization with other microorganisms:
a. no (0 points), b. yes (1 point)

9. Radiological severity (more than 3 lobes involved or cystic bronchiectasis):
a. no (0 points), b. yes (1 point)

Scoring: Total score is calculated as a sum of the scores for each variable.

According to the overall score value, the patients with bronchiectasis are classified into 3 BSI classes:
A. Low BSI score (overall score 0-4 points),
B. Intermediate BSI score (overall score 5-8 points)
C. High BSI score (overall score of 9 or more points)

The SGRQ is designed to measure health impairment in patients. Three-component scores are calculated for the SGRQ: Symptoms - this component is concerned with the effect of respiratory symptoms, their frequency, and severity. Activity - concerned with activities that cause or are limited by breathlessness Impacts - covers a range of aspects concerned with social functioning and psychological disturbances resulting from airway disease.

The Total score is calculated in a similar way:
Score = 100 x Summed weights from positive items in the questionnaire / Sum of weights for all items in the questionnaire
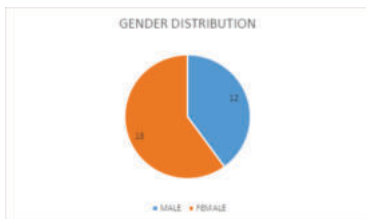
### STATISTICAL ANALYSIS:
All the variables will be recorded in the predesigned format and later in a Microsoft excel sheet. All the data will be analyzed by using the IBM-SPSS software version 20.0.
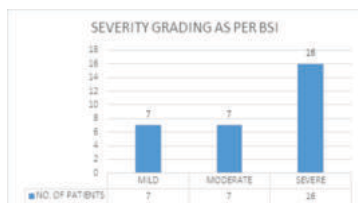
### RESULTS:
The mean age in our study was 54.46.


AGE DISTRIBUTION
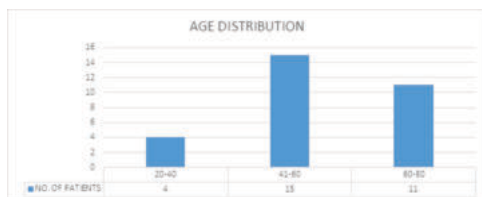
In our study, the female predominance (60%) > male (40%).


GENDER DISTRIBUTION

The mean BSI severity score was 8.66


SEVERITY GRADING AS PER BSI

### DISCUSSION:
The disease severity of bronchiectasis in the present study was obtained by BSI score. The BSI score was then correlated with health-related quality of life using the SGRQ questionnaire. The present study included 30 patients who were diagnosed with bronchiectasis based on clinical and radiological evidence and their severity index was compared to health-related quality of life. In the present study, most of the patients belong to 40-60 years (n=15), and 36.6% belong to >60 years. Many studies have shown that the prevalence of bronchiectasis increases with age. The mean age in our study was 54.46.

There was a higher proportion of female participants (60%) with bronchiectasis included in the study when compared to males (40%).

The Bronchiectasis Severity Index incorporates 9 variables including age, Body mass index (BMI), FEV1 % predicted hospital admission in the previous year, exacerbations in the previous year, dyspnoea scale by MRC, Pseudomonas aeruginosa colonization, and colonization with other microorganisms. The severity is classified viz: Mild: ≤ 4; moderate: 5-8 and severe: ≥9. The study participants obtained scores ranging from 1 to 20. The mean BSI score was 8.66. In our study 53.4% were characterized as severe bronchiectasis according to the BSI score. The mild and moderate bronchiectasis categories were 23.6% each. In a study conducted by Rosales-Mayor E et al. the proportion of mild, moderate, and severe bronchiectasis were 25%, 32 %, and 43% respectively which is similar to our study[4]. The mean SGRQ percentage was 18.38. The St. George Respiratory Questionnaire (SGRQ) is a health-related QOL questionnaire that was used in this study to estimate the QOL among patients suffering from bronchiectasis. The BSI score and SGRQ score percentage had a highly significant correlation (p <0.001). PG Varughese, Weatherall et al conducted a similar study which also showed similar results of correlation between the SGRQ score and BSI score. More the severity of the bronchiectasis according to the BSI score higher the SGRQ score and the lower will be the quality of life as more lung airways and parenchyma are involved[5].

### CONCLUSION:
Bronchiectasis is a chronic lung disease that damages the architecture of the airways which impairs lung function and in turn the quality of life in patients. The Bronchiectasis severity index (BSI) uses multiple parameters and determines the severity of bronchiectasis in patients and this helps in assessing the prognosis, exacerbations, and quality of life. In our study, there was a positive correlation between the BSI score and the SGRQ score.

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