Association Between Body Mass Index and Spirometric Measurements of Patients with Chronic Obstructive Pulmonary Disease

Dr. Md. Jahangir Hossain¹, Dr. A.R.M. Saifuddin Ekram², Dr. Zahirul Haque³, Dr. Azizul Haque Azad⁴, Dr. Samir Mojumdar⁵, Dr. Md. Nur-e-Alam Siddique⁶.

Rajshahi Medical College Hospital, Rajshahi
Background

Chronic obstructive pulmonary disease (COPD) is a major cause of chronic morbidity and mortality throughout the world. It is a preventable and treatable disease with significant extra pulmonary effects that may contribute to the severity in individual patients.
Body mass index (BMI) is an important indicator that can well reflect nutritional status of patients, and low BMI is an independent risk factor for mortality in patients with COPD. The decline in BMI in patients with COPD is a marker of advanced disease. This study is undertaken to investigate the relationship between BMI and pulmonary function of COPD patients.
Objective

To investigate the relationship between BMI and spirometric measurements of COPD patients.
Materials & Methods

Study design

Cross-sectional type of descriptive study.

Study period

1 year (Dec 2010 to Nov 2011)

Study place

Department of Medicine, Rajshahi Medical College Hospital, Rajshahi.

Sample size

Sample size was 82 having exposure to > 10 pack year smoking and who fulfill the inclusion and exclusion criteria was enrolled in this study.
Materials & Methods

Sampling Method

Purposive sampling.

Inclusion criteria

Patients admitted in Rajshahi Medical College Hospital, who fulfilled the following criteria ---

1. Age more than 40 years.
2. Patients of both sexes
3. Established patients of COPD with or without cor pulmonale evidenced by spirometry and echocardiography
Exclusion criteria

1. Patients who did not agree to be included in this study.
2. Age less than 40 years.
3. Patients having active or old pulmonary tuberculosis, bronchiectasis, malignant disease, chronic liver disease, diabetes mellitus.
Materials & Methods

- BMI was categorized as underweight (<20kg/m²), overweight (25.0-29.9kg/m²), and obese >or=30.0kg/m².
- Spirometry was done before and after bronchodilator. The parameters measured were FEV₁, FVC and FEV₁/FVC%.
Of the 82 patients, 20 (24.39%) were of normal weight, 22 (26.82%) were underweight, 25 (30.48%) were overweight, 15 (18.29%) were obese.
FEV1/FVC and FEV1% predicted were lowest in the underweight patients and highest among the obese and overweight patients. A positive correlation between BMI and FEV1/FVC, FEV1% predicted was observed (correlation coefficient (r) was 0.788, 0.802 respectively, both P values were <0.05).
<table>
<thead>
<tr>
<th>Variables</th>
<th>Obese (BMI ≥30) (n=15)</th>
<th>Overweight (BMI ≥25-29.9) (n=25)</th>
<th>Normal weight (BMI ≥18.5-24.9) (n=20)</th>
<th>Underweight (BMI &lt;18.5) (n=22)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV₁% predicted</td>
<td>69.7±3.3</td>
<td>67.5±2.2</td>
<td>61±2.8</td>
<td>41.5±3.1</td>
<td>0.00</td>
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<tr>
<td>FEV₁/FVC (%)</td>
<td>64.8±3.5</td>
<td>63.5±3.3</td>
<td>59.2±2.7</td>
<td>43.4±4.6</td>
<td>0.01</td>
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<tr>
<td>BMI</td>
<td>31.5±2.9</td>
<td>27.3±1.21</td>
<td>20.9±1.86</td>
<td>17.07±2.2</td>
<td>0.02</td>
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</tbody>
</table>
Conclusion

BMI alterations are common in COPD patients. A high proportion of patients with COPD experience a significant weight loss which is associated with increased morbidity and mortality. Such patients should be alert to adhere to maintain nutritional status of the body so that they can avoid weight loss for better survival.
Authors

- Dr. Md. Jahangir Hossain\textsuperscript{1}, FCPS Course Student (Medicine), OSD (Deputation in BSMMU), DGHS, Mohakhali, Dhaka.
- Dr. A.R.M. Saifuddin Ekram, FCPS (Medicine), FACP (USA), PhD, FRCP (Edin), Professor (C.C.) and Head, Department of Medicine, Rajshahi Medical College Hospital, Rajshahi, Bangladesh.
- Dr. Zahirul Haque, FCPS (Medicine), Assistant Professor, Department of Medicine, Rajshahi Medical College Hospital, Rajshahi
- Dr. Azizul Haque Azad, FCPS (Medicine), MRCP(UK), Assistant Professor, Department of Medicine, Rajshahi Medical College Hospital, Rajshahi
- Dr. Samir Mojumdar, MD (Chest), Assistant Professor, Department of Respiratory Medicine, Rajshahi Medical College Hospital, Rajshahi
- Dr. Md. Nure Alam Siddique, FCPS (Medicine), MD (Int. Medicine), Rajshahi Medical College Hospital, Rajshahi

Address for correspondence:
- Dr. Md. Jahangir Hossain. FCPS Course Student (Medicine), OSD (Deputation in BSMMU), DGHS, Mohakhali, Dhaka.
- Mobile no.: +8801716734237
Thank You