Ventilatory Function of Jute Mill Workers in Border Areas of Bihar

Kamakhya Kumar, Assistant Professor, Dept. of Physiology, M. G. M. Medical College, Kishanganj, Bihar.

Abstract

Aim: To study the effect of jute-dust and further impact of smoking on pulmonary function test parameters in jute mill-workers. Method and Result: With the help of computerized multifunctional spirometer 91 male workers were compared with 90 controls for their PFT-parameters. The study indicated an overall reduction in FVC, FEV1, PEFR, FEF (25-75) % and MVV. FEV1/FVC was within normal range. Further division of workers into smoker and non-smokers there was a more decline in FEV1 along with FEV1/FVC in smokers. Conclusion: Exposure of jute-dust lead to combined type of restrictive/obstructive lung diseases.

Keywords
pulmonary function, spirometer, jute-dust exposure

Introduction

Industrial dusts are known to cause an increased morbidity and mortality among exposed population all over the world. Most of the workers engaged in building, pottery, fabric, timber and mine industries suffer from non-specific lung diseases and ventilatory disorders. There are many such industries situated in border areas of Bihar nearby Kishanganj distt, and so far no study was undertaken. The present study was conducted to evaluate the pulmonary function of jute mill workers and examine the relationship with smoking in this environment, which are also exposed to industrial dust as other workers in similar type of industries.

Method

Present study was conducted in the dept. of physiology, MGM Medical College, Kishanganj over a period of one year (Aug’12-Aug’13). Study protocol has been approved by the institutional ethics committee and written informed consent was obtained from all study participants. 91 male workers of various jute- mills aged 20-60 yrs and 90 male employee 18-58 yrs of MGM Medical College were randomly selected. A brief clinical sheet regarding age, duration of dust exposure, smoking habit, presence/absence of respiratory symptoms, Ht. and Wt. were recorded. PFT – parameters were recorded in computerized spirometer. The test was performed with nose closed by nasal clip, and the mouth piece was inserted between the teeth and the lips. Subject is then instructed to breathe in with a maximum effort from the end of resting expiration and subsequently to breathe out completely with maximum effort. Best of three readings were considered for analysis. The statistical analysis was performed using unpaired student’s t-test of (mean ± SD) values. p-value<0.05 was considered as significant.

Results

Out of 91 male workers, 31 were smoker (32%) and 60 were non smokers (68%). They were compared with

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Controls (n=90)</th>
<th>Workers (n=91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>29 ± 8.5</td>
<td>28 ± 7.4</td>
</tr>
<tr>
<td>Wt.(kg)</td>
<td>56 ± 7.4</td>
<td>53 ± 8.5</td>
</tr>
<tr>
<td>Ht.(cm)</td>
<td>162 ± 5.5</td>
<td>164 ± 6.2</td>
</tr>
</tbody>
</table>

Table 1

Physical characteristics of workers and controls

Address for correspondence: Dr Kamakhya Kumar, New PGT Quarter, Room No. 214, M.G.M. Medical College, Kishanganj - 855 107, Bihar. E-mail : drkamakhya72@gmail.com
All characteristics of this work are tried to be shown in Tables 1, 2, 3, 4 & 5.

**Discussion**

The main objective of this study was to evaluate the effect of jute-dust exposure on PFT in workers of jute mills and examine the relationship with smoking. Determination of PFT-parameters revealed that all variables except FEV1/FVC were significantly reduced in workers. Similar type of result was found by Rastogi et al in saw-mill workers in 1989 and silica exposed workers in 1990. Lung function values recorded in mill workers exposed to dust showed a significant reduction in PEFR and FEF (25-75) % for both smoker and non smoker with the
exception of FEV1/FVC. In this study a combined type of spirometric deficit revealed restrictive/obstructive disease. This view is also supported by the evidence of their chief complaints. Becklake et al found similar type of result in 1996. Occupational exposures may also cause reversible airway obstruction. The PFT-parameters recorded for smokers in present study is similar in findings of other investigators. This study indicated an overall reduction in ventilatory capacity in particular FVC, FEV1, PEFR, FEF (25-75) %, MVV and higher % ge of chronic respiratory symptoms in jute-mill workers. Smoking in such environmental exposure may lead to further significant deterioration of PFT parameters. Engineering control, industrial hygiene and health education are mandatory for dusty activity.

Acknowledgement
I gratefully acknowledge the genius assistance of Mr. Mihir Hazra (Medical Technologist) of physiology deptt. for his useful contribution in typing works.

References