ABSTRACT

Background: The study aims is to determine any relationship between the peak expiratory flow rate and absolute eosinophil count among the cement workers and the non cement workers not exposed to cement in the Guwahati city.

Methods: Peak expiratory flow rate were obtained from 30 cement dust exposed male workers and 30 non cement male workers between 20-40 years using Medspiror (HELIOS) digital spirometer in the department of Physiology, Gauhati Medical College, Guwahati, Assam and absolute eosinophil count were done by collection of blood samples in EDTA test tube in a improved Neubauer's chamber. Statistical analysis was done as Mean±standard deviation.

Results: It was observed that PEFR showed a significant decrease value and Absolute eosinophil count showed a significant increase value among the cement workers.

Conclusions: Cement exposure can lead to respiratory diseases associated with eosinophilia.

KEYWORDS

Peak expiratory flow rate, Absolute eosinophil count, Age 20-40 years, Cement dust particles.
significant increase as compared to the non cement workers with $P$-value $<$0.01.

### TABLE 1- AGE DISTRIBUTION OF NON CEMENT WORKERS AND CEMENT WORKERS

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Non Cement workers (Mean±std)</th>
<th>Cement workers (Mean±std)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>33.03±3.8</td>
<td>31.5±4.2</td>
<td>0.14</td>
</tr>
</tbody>
</table>

### TABLE 2- PEFR AMONG CEMENT WORKERS AND NON CEMENT WORKERS

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Cement workers (Mean±std)</th>
<th>Non Cement workers (Mean±std)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEFR (litres/sec)</td>
<td>5.3±1.69</td>
<td>6.8±1.11</td>
<td>$&lt;0.05^*$</td>
</tr>
</tbody>
</table>

*Unpaired t-test; $p$-value $<$0.05 =significant

### TABLE 3- ABSOLUTE EOSINOPHIL COUNT AMONG CEMENT WORKERS AND NON CEMENT WORKERS

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Cement workers (Mean±std)</th>
<th>Non Cement workers (Mean±std)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEC(cells/cum m)</td>
<td>253.8±58.7</td>
<td>140.9±53.5</td>
<td>$&lt;0.01^*$</td>
</tr>
</tbody>
</table>

*Unpaired t-test; $p$-value $<$0.01 =highly significant

### DISCUSSION:
The peak expiratory flow rate and absolute eosinophil count were studied and compared among the cement industry workers and non cement workers of Guwahati city. We observed that the peak expiratory flow rate among the cement workers were significantly low which also correlated with other studies.[6,13,16] Study showing higher prevalence rates of recurrent and prolonged cough, phlegm, dyspnoea, bronchitis, shortness of breath and bronchial asthma with cement dust exposure were observed further correlating the role of cement with respiratory impairments.[1] The cement dust particles accumulate in the upper and lower airways of the tracheo-bronchial region of the lungs resulting in shortness of breath and coughing. Interaction between cement dust particles and the mast cell or basophil surface results in their degranulation and release of a variety of pharmacological active agents, including histamine and serotonin; the effect of these amines on tissues such as bronchial smooth muscles and vascular endothelium produces many of the symptoms of atopic conditions observed.[2] Bioaccumulation of some specific components as chromium and silica present in the cement dust in the respiratory tract may lead to delayed hypersensitivity reaction and chronic inflammation and hence impaired respiratory function.[12] We also observed that the absolute eosinophil count of the cement workers were significantly increased which correlates with the study done by Mandal et al.[7] This increase in eosinophil count is showed to be associated with allergic responses that contribute to the respiratory diseases.[5]

### CONCLUSION & FUTURE SCOPE:
Occupational hazards like cement dust are a growing concern in this industrialized world. Lung function parameters along with hematological investigations are an important tool for monitoring the health of the cement workers and should be performed at regular intervals. India is a country of different ethnic groups which should be taken into consideration and studies with a larger sample size relating to it should be done to observe the variations seen among them.

### ACKNOWLEDGEMENT:
I express my sincere sense of gratitude and regards to all the faculty members of Department of Physiology, Gauhati Medical College and Hospital, Guwahati; all study participants and my family Members for their supports and advice in completing this work.

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