

Field Study

The Influence of Workplace Environment on Lung Function of Flour Mill Workers in Jalgaon Urban Center

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Abstract: The Influence of Workplace Environment on Lung Function of Flour Mill Workers in Jalgaon Urban Center: Nilesh D. WAGH, *et al.* School of Environmental Sciences, North Maharashtra University, India—The workplace environment affects the health of workers. Unhygienic conditions are observed in the workplace environment of flour mills as fine organic flour dust gets airborne in the indoor environment of the flour mills. The present work was undertaken to study the health problems related to the workplace environment of flour mill workers. The results show that flour mill workers are receiving a heavy dose (average exposure concentration, $624 \mu\text{g}/\text{m}^3$) of flour dust. To determine the impact of flour dust on the lung function of the workers spirometric analysis was conducted. Significant declines in forced vital capacity (FVC), peak expiratory flow rate (PEFR) and forced expiratory volume in one second (FEV_1) were observed in the flour mill workers as compared to expected values. This study reveals reduced lung efficiency of flour mill workers due to excessive exposure to fine organic dust prevalent in the workplace environment. The impairment in lung efficiency was increased with duration of exposure in the flour mill workers. The analysis of questionnaires used to generate information on self-reported problems reveals that most of the workers were suffering from asthma and respiratory problems. Furthermore, the data shows that 42% of the flour mill workers were having shortness of breath problems, 34% of workers were having frequent coughing, and 19% workers were having respiratory tract irritation. We recommend the compulsory use of personal protective equipment (nose mask) by flour mill workers during working hours. This would help to protect the workers health from the flour dust prevalent in the workplace environment. A regular periodic examination is necessary to measure the

impact of particulate matter on the health of the flour mill workers.

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Key words: Dust dose, Flour dust PEFR, FEV_1 , FVC

Indoor air pollution is a major problem in developing countries, and is increasing more and more due to rapid industrialization and ineffective pollution control measures. It has increased due to lack of public awareness of the impact of indoor air pollutants on human health. Flour mills produce a large amount of flour dust. On average flour mill workers are exposed to the workplace environment for 8–10 h a day and there are no provisions for minimization of the dust produced in the flour mills in India. Poor ventilation is a basic problem in flour mills throughout the country. Flour dust accumulates in the workplace environment because of poor ventilation, hence workers get exposed to excessive amounts of flour dust. Long-term continuous exposure of workers to fine dust leads to pulmonary and respiratory diseases.

The respiratory health effects documented in workers exposed to a variety of dusts include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alteration of the body defense system against foreign materials, damage to lung tissue and premature death¹⁾. The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary diseases, cardiovascular disease, influenza and asthma^{2, 3)}.

Prolonged exposure to dust can result in chronic lung problems^{4–8)}. Investigations of the respiratory health effects from flour dust exposures are necessary in order to predict the risk factors that may cause an asthmatic response^{9–11)}. Sultan A Meo¹²⁾ has confirmed that the long-term exposure of human beings to flour dust may cause acute or chronic respiratory disease. Continuous flour dust inhalation can lead to symptoms of lower respiratory tract inhalation such as cough, shortness of breath and

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