EFFECT OF OCCUPATIONAL EXPOSURE TO VOLATILE ORGANIC COMPOUNDS AND INORGANIC DUSTS ON RESPIRATORY HEALTH

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Introduction Worldwide, workplace exposure to inorganic dusts and volatile organic compounds (VOCs) have detrimental effect on respiratory health and is a major public health challenge among industrial workers. The characteristic of the respiratory disease outcome is influenced by nature of the inorganic dust or VOCs, dose, duration of exposure and genetic factors. Hence, this study was conducted to evaluate the impact of occupational exposure to varied air pollutants among workers in unorganised and organised industrial sectors.

Methodology This cross-sectional study was conducted among 150 workers of age within 30–60 years after getting approval from Institutional Ethics Committee and authorities. Subjects with known history of tuberculosis, malignancy, and recent surgery were excluded. Exposure assessment was obtained using a validated questionnaire. The airborne concentration of top 10 VOCs were measured using gas chromatography. Respirable dust and total dust monitoring were carried out with area air samplers as per NIOSH guidelines. Pulmonary function parameters were measured using spirometry.

Results This study showed that cumulative VOC exposure index of construction painters was 5.73ppm. Total and respirable dust concentration ranged from 0.1 – 13.7 mg/m³ and 0.07 – 5.2 mg/m³ respectively. The mean Forced Expiratory Volume and peak expiratory flow rate of industry workers were 2.69 ±0.48L and 5.89 ± 1.7L/s respectively. The chief lung function parameters were lower in high exposure (above threshold limit) group than the low exposure group in steel industry.

Conclusion This study demonstrated a decline in the pulmonary function parameters among steel industrial workers than the painters exposed to VOCs. However, the strength of association varied with age, region and duration of exposure. The findings of this study has provided a clear insight about the varied health impacts of VOCs and industrial dusts which would pave way for creating awareness and developing appropriate protective intervention programs.