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Detection of airway inflammation among cement workers in a cement factory, Asyut Governorate, Egypt (2017-2018)

Introduction: There is rapid increase in the global production and consumption in cement industry. Egypt is one of the greatest cement producers worldwide. Cement dust particles is the major source of occupational hazard in cement factory. The main routes of entry of cement particles are inhalation and swallowing leading to different clinical affection involving respiratory and non-respiratory systems. Prolonged exposure especially to high concentration of cement dust may provoke inflammation, resulted in functional and structural abnormalities.

Objective: The current work aimed to explore the most important correlates associated with inflammation among cement workers.

Methodology: We conducted a cross-sectional study to elicit the effect of working in cement factory on the level of airway inflammations among workers. Inflammatory process was assessed by clinical manifestations, spirometer, fractional exhaled Nitric oxide (FeNO) (by exhaled breath condensate method), blood sample (for complete blood picture and inflammatory markers: total IgE, IL10 and TNF alpha), sputum analysis for eosinophilia.

Results: The total dust particles concentration ranged between 1.99 mg/m³ in raw mills area to 3.35 mg/m³ in quarry area. Total sample was 86 workers; from four main departments (quarry, production, packing and maintenance). There was significance difference in the level of markers between different departments; TNF alpha was higher in the packing area (p=0.002) and fractional exhaled nitric oxide was higher in the maintenance (p=0.02). Moreover there was negative mild correlation between dust particles concentrations (mg/m³) and FEV1 (predicted %) (r=-0.2, p=0.05) and FVC (predicted %) (r=-0.2, p=0.02). The difference in rates of respiratory symptoms among high vs. low exposed workers was statistically insignificant. TNF alpha was higher in high exposed workers than low exposed (p=0.01), there was positive strong correlation between TNF alpha and IL10 (r=0.8, p<0.001).

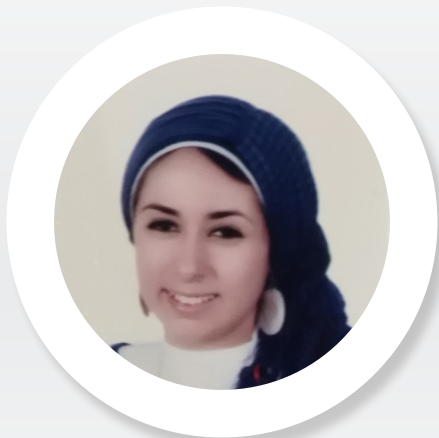
Conclusion: The study suggests that TNF alpha and exhaled NO are good predictors of early pulmonary inflammation even before symptoms and may be used in workers of cement factory especially those with higher exposure and in areas with higher dust concentrations, the most important inflammation correlates among cement workers were job stress and smoking.

Recommendations: The findings of this research will help building new strategies to protect the most vulnerable workers

Biography

Mariam Roshdy Elkhayat has completed her Master's degree from Assiut University in Egypt. She is working as an Assistant Lecturer in Public Health Department and has international participation in "HIS Middle East Infection Prevention Summit" Dubai, June 3-4, 2015 conference and publication in Egyptian Journal of Occupational Medicine 2015, also has effective activities in PLAN, CDC and Population Council organizations. She is also working as Safety Trainer for different companies such as CEMEX & TAQA (national gas company) and acts as Consultant in youth friendly clinic and in Assiut National Insurance Organization for occupational compensations.

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