

Exposure to Particulate Matter and Pulmonary Function Status of Traffic wardens in Two Selected Local Government Areas in South-Western Nigeria.

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Abstract

Vehicular emissions are a complex mix of pollutants. Although data on road traffic emissions are available in Nigeria, information as regards the personal exposure of traffic wardens to particulate matter is lacking. We determined the levels of particulate matter and then assess its effect on the pulmonary function of traffic wardens.

Ibadan North and Northeast Local Government Areas were purposely selected for this descriptive cross-sectional study. Concentration of particulate matter was measured using personal respirable dust sampler model APM 801 within 30cm range of the traffic wardens' nasal region and values were compared with WHO guideline limit. Measurements were done in the morning (6am-8am), afternoon (12pm-2pm) and evening (4pm-6pm). A calibrated spirometer was used to determine the Force Expiratory Volume in 1 second (FEV₁) of traffic wardens. Data were analyzed using descriptive statistics, t-test and Pearson correlation test at P = 0.05.

The mean concentration of particulate matter recorded in the afternoon was $28.1 \pm 11.5 \mu\text{g}/\text{m}^3$. This value exceeded the WHO guideline limit for particulate matter ($25 \mu\text{g}/\text{m}^3$). The peak concentration of particulate matter ($49.01 \mu\text{g}/\text{m}^3$) was obtained in the evening. There was a significant difference between the actual FEV₁ of the Traffic wardens ($2.21 \pm 0.71\text{L}$) and their expected FEV₁ ($4.01 \pm 0.57\text{L}$). A significant negative correlation was observed between particulate matter and the actual FEV₁ of Traffic wardens ($r = -0.6$).

Traffic wardens are highly vulnerable to respiratory impairment due their exposure to particulate matter at concentrations that exceed WHO guideline limit. The use of nose mask and regular health check up is recommended.