International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 04 Issue 10
September 2017

A Respiratory Health Survey and Effects of Air Pollution In Urban Community

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ABSTRACT: *The Community Respiratory Health Survey was planned to answer specific questions about the distribution of asthma and health care given for asthma in the Urban Community. There is various evidence that suggests that air pollution contributes to the large global burden of respiratory and allergic diseases including asthma, chronic obstructive pulmonary disease, pneumonia and possibly tuberculosis.*

Although associations between air pollution and respiratory disease are difficult to prove, but recent studies have led to an increased recognition of the emerging importance of traffic-related air pollution in both developed and less-developed countries.

This study indicate that air pollution from these sources is a major preventable cause of increased incidence and exacerbation of respiratory disease. Physicians can help to reduce the risk of adverse respiratory effects of exposure to biomass and traffic air pollutants by promoting awareness and supporting individual and community-level interventions.

Keywords

biomass; traffic; COPD; asthma; air pollutants, respiratory health.

Introduction

Worldwide increases in rates of asthma and COPD over the past several decades have motivated intensive investigation of the role of environmental factors, including air pollution, in their causation. Recent research also suggests that air pollution contributes to the substantial worldwide burden of disease from acute lower respiratory infections and possibly tuberculosis. While the health effects of air pollution have been an

international public health concern since at least the 1950's, recent research has heightened the focus on two broad sources of air pollution: biomass fuels (BMF) and motor vehicles. Understanding of the health effects of BMF and traffic-related air pollution (TRAP) has lagged behind that of ambient air pollution, at least in part due to challenges in estimating highly-variable individual exposure from these widespread, but very localized, air pollution sources.

Of course, air pollution is only one of many environmental (non-genetic) factors for which a causative role in exacerbation or incidence of complex respiratory diseases has been suggested. Indeed, based on ecological analyses from the International Study of Asthma and Allergies in Childhood (ISAAC)[1] , generally less-polluted developed countries (DCs) have much higher rates of asthma than many countries with higher levels of air pollution. However, studies with individual-level analyses that control for potential confounding have demonstrated associations between air pollutants, including TRAP, and asthma exacerbation, as well as possible links to increased asthma incidence. Additional evidence suggests that exposure to TRAP is correlated with the rising rates of allergic respiratory disease. [2] Although tobacco smoke is clearly the dominant cause of COPD worldwide, BMF smoke is now recognized as a major cause of COPD, especially among women in less developed countries (LDCs). Current evidence also indicates that BMF smoke plays a causative role in mortality from lower respiratory infections among children living in homes where BMF is used. The effects of indoor air exposures and individual ambient pollutants on asthma have recently been discussed in recent researches. [3] The growing body of recent research has been emphasized on pertaining to the relationship between respiratory health effects and exposure to TRAP and biomass air pollution. Recent reviews of the respiratory health effects of traffic exposures have been explained by Kelly and Fussell (2011)[4] and Salam et al. (2008)[5] , and for BMF by Torres-Duque C (2008)[6] , Balmes (2010)[7] , Fullerton (2008). [8] In our study we will study the effect of air pollutants exposure on the urban community and draw conclusion regarding it's effect and control. [9]

Materials and Methods

A descriptive, cross-sectional study was conducted in catering area of Urban health training centre of People's College of Medical Sciences and Research Centre, Bhopal (M.P). Participants were randomly selected from the houses of urban community near urban health and training centre. Questionnaire was given and filled by the participants with general check up done by physician in charge. All symptoms and signs of possibly affected participants were assessed and recorded. Those who were included in our study fulfilled the following inclusion criteria: age ≥16 years, presenting with mild respiratory symptoms that included cough, wheezes, shortness of breath, and chest tightness. Exclusion criteria were age <16 years, not presenting with mild, moderate or severe respiratory symptoms that included cough, wheezes, shortness of breath, and chest tightness, no respiratory illness symptoms. The age, sex, height, and weight of each participant were registered.

The patients were asked to give their written consent before participation in the study. Data obtained were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.

Results

Table 1: Distribution of study population according to gender, age group and body mass index (n=600)

Gender	Exposure Present	Exposure Absent	P value
Male	201	157	Chi square = 5.495
Female	159	83	P value = 0.019
	360	240	
Age group (years)			
≤30	78	96	Chi square = 34.388
31-50	256	143	
>50	26	1	P value = 0.00

	360	240	
Body Mass Index			
<18.50 18.50-24.99 ≥30	187 11 162	204 17 19	Chi square = 94.79 P value = 0.00
	360	240	

Table 2: Distribution of study population according to respiratory symptoms (n=600)

Respiratory Symptoms	Exposure present	Exposure absent	P value
Nasal symptoms	46	0	
Throat symptoms	56	9	
Eye symptoms	26	1	
Skin symptoms	5	51	
Headache	86	1	
Fatigue	39	41	P = 0.00
Cough	45	19	
Wheezing	14	0	
Breathlessness	28	0	Chi square = 355.263
Common cold	1	28	
Tonsillitis	11	26	
Sinus infection	1	1	
Middle ear infection	1	38	
Diarrhea	1	25	
Total	360	240	

Characteristics and symptoms of the study population

A higher proportion of men were observed among those with any exposure compared with those with no exposure ($p<0.05$) The differences in the other characteristics were smaller. Those with any exposure were more of 31 to 50 years age group. ($p<0.05$). Those with exposure were of similar proportion in BMI <18 and BMI >30 group participants. Nose and throat symptoms were more among exposed as well as more headache and fatigue was observed than those with no exposure. Occurrence of breathlessness was also more common among the exposed compared with the unexposed. Some respiratory infections occurred more commonly among the unexposed than among the exposed subjects, including sinus infections and middle ear infections. None of the 600 study subjects reported having experienced pneumonia in the past year.

Discussion

This descriptive, cross-sectional study was conducted in catering area of Urban health training centre of People's College of Medical Sciences and Research Centre, Bhopal (M.P) showed a significant effect of exposure to air pollutants with respiratory illness. A strikingly consistent finding was the relation of these exposures with headache and fatigue, even after adjustment was made for confounders such as psychosocial factors. The occurrence of headache showed a dose–response relationship with the number of exposures. These findings suggest that air pollutants may actually be absorbed into the circulation and dispersed to the central nervous system. Another possible explanation is that chemicals induce a low-grade inflammation, which in turn could entail production of cytokines that can pass through the blood–brain barrier, inducing general symptoms. Among chronic respiratory symptoms, the risk of breathlessness was consistently related to all exposures of interest. These findings suggest that there is airborne exposure to irritant agents, or perhaps even to some sensitising agents. Tonsillitis showed a dose–response relationship with the number of exposures. The relationship with diarrhea suggests that this exposure may affect health also through the oral route.

We found increased risks of nasal, throat and skin symptoms. In addition, we found significant relationships with the general

symptoms such as headache and fatigue, breathlessness, and tonsillitis and middle ear infections, which earlier studies did not investigate at all, or for which no significant association, as found.

We found a dose–response relationship between the number of exposures and the risks of headache and other respiratory symptoms.

Limitations: Our finding of increased risk of nasal symptoms as exposure is consistent with air pollutants.

CONCLUSION

This study provides new evidence that exposure to air pollutants increases the risk of headache, fatigue and chronic breathlessness . It also provides evidence that the risks of tonsillitis and middle ear infections are higher in employees exposed to these sources. The study strengthens the evidence that such exposures are related to upper airway symptoms and that exposure to pollutants is related to headache, fatigue, breathlessness, , sinus infections, and middle ear infections. Exposure to pollutants is also associated with increased risk of eye symptoms and diarrhoea, suggesting that direct contact of fingers, , with eyes and mouth may be an important exposure route. Irritative and neurotoxic effects seem to have importance as mechanisms, but immunological reactions cannot be excluded and they can be operating as well. This study suggests that reduction of these exposures in environments is likely to improve the health of urban community. The measures that can be introduced to reduce the exposures include reduced handling of the sources of exposure, improved ventilation where such handling is necessary.

ACKNOWLEDGEMENTS

We thank our urban health training centre staff and interns participating in this study.

REFERENCES

[1] Beasley R. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema: ISAAC. The Lancet. 1998; 351(9111):1225–1232.

[2] D'Amato G, Cecchi L, D'Amato M, Liccardi G. Urban Air Pollution and Climate Change as Environmental Risk Factors of Respiratory Allergy: An Update. J Invest Allerg Clin. 2010; 20(2): 95–102.

[3] Peden D, Reed CE. Environmental and occupational allergies. J Allerg Clinl Immunol. 2010; 125 Suppl 2(2):S150–S160.

[4] Kelly FJ, Fussell JC. Air pollution and airway disease. Clin Exp Allergy. 2011 Epub ahead of print.

[5] Salam MT, Islam T, Gilliland FD. Recent evidence for adverse effects of residential proximity to traffic sources on asthma. Curr Opin Pulm Med. 2008; 14(1):3–8.

[6] Torres-Duque C, Maldonado D, Perez-Padilla R, Ezzati M, Viegi G. Forum of International Respiratory Studies Task Force on Health Effects of Biomass E. Biomass fuels and respiratory diseases: a review of the evidence. Proc Am Thorac Soc. 2008; 5(5):577–590.

[7] Balmes JR. When smoke gets in your lungs. Proc Am Thorac Soc. 2010; 7(2):98–101.

[8] Fullerton DG, Bruce N, Gordon SB. Indoor air pollution from biomass fuel smoke is a major health concern in the developing world. Trans Royal Soc Trop Med Hygiene. 2008; 102(9):843–851.

[9] 9. Robert J. Laumbach, Howard M. Kipen, Respiratory Health Effects of Air Pollution: Update on Biomass Smoke and Traffic Pollution , J Allergy Clin Immunol. 2012 January ; 129(1): 3–13.