

OUTDOOR AIR POLLUTION AND ITS EFFECTS ON ALLERGIC DISEASES IN AN INDUSTRIAL CITY OF KOREA

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Background and aims: The prevalence of allergic diseases (AD) has significantly increased in recent decades. Outdoor air pollution can be considered as an important environmental risk to the increased prevalence of AD. This study aims to identify the major risk factors for childhood AD by a unique and standard ISAAC questionnaire and investigate relationship between outdoor air pollution and the AD prevalence in an industrial city of Ulsan in Korea.

Methods: Data on the physician-diagnosed prevalence in the past 12 months and potential risk factors of AD (asthma, allergic rhinitis and atopic dermatitis) were collected in 2009 and 2010 from the survey of 4,067 schoolchildren (grades 1-6) living near and far from industrial area. Exposure to outdoor air pollution was estimated by using annual mean concentrations of pollutants (PM₁₀, O₃, NO₂, SO₂ and CO) obtained from monitoring sites near the participant's residence. All data were analyzed with SPSS 18.0 and odds ratio was calculated by logistic regression analysis to estimate the independent effect of each study factor on AD.

Results: Current prevalence of AD was most strongly associated with parental AD history and place of residence. After adjusting for the parental AD history and other significant factors, we observed that the AD prevalence ratio for polluted urban area near the industrial complex as compared with the suburban was 1.39 (95% CI: 1.16–1.67). Statistically significant and robust association between air pollution levels and the prevalence of AD were also found both before and after adjustment by confounders. The adjusted odd ratio for the pollution effects were 1.24 (95% CI: 1.04-1.47) and 1.90 (95% CI: 1.23-2.93) with increase in PM₁₀ level of 10 µg/m³ and O₃ level of 10 ppb, respectively.

Conclusions: Although there should be other risk factors for AD, these results suggest that living in polluted area and exposure to high levels of air pollutants can contribute to the increased risk of childhood AD.