

Cysteinyl leukotrienes as biomarkers of effect in linking exposure to air pollutants and respiratory inflammation among school children

ABSTRACT

Background: Industrial activities contribute to poor air quality either directly or through background concentrations, bringing to fore health issues regarding the health effects of the release of malodourous air pollutants. **Methods:** This research focused on the effects of exposure of air pollutants from industrial facilities and traffic on school children by using selected airway inflammation biomarker, cysteinyl leukotrienes (CysLTs), in sputum. Questionnaires adapted from the American Thoracic Society (ATS) and the International Study of Asthma and Allergies in Childhood (ISAAC) were used to compile respiratory symptoms, history of exposure, and demographic data. **Results:** CysLTs level measured by using enzyme-linked immunosorbent assay (ELISA) was higher in the exposed group (0.402 ± 0.389 ng/mL) than in the comparative group (0.191 ± 0.231 ng/mL). A strong, significant correlation was established between sulfur dioxide (SO₂) ($r = 0.924$, $P < 0.001$) and particulate matter 2.5 (PM_{2.5}) ($r = 0.242$, $P = 0.014$), with the levels of CysLTs among school children in exposed group. This study reveals that SO₂ is the most significant factor that influenced CysLTs levels among school children at P less than 0.001. **Conclusion:** CysLTs are proven to be reliable biomarkers of airway inflammation in healthy children, whereas sputum method is proven to be a reliable, safe and noninvasive procedure for school children with their reproducibility and sensitivity as portrayed in this study. Thus, the findings provide fundamental aspects relevant to future interventions to healthy children living near an industrial area from the environmental scope.

Keyword: Cysteinyl leukotrienes; NO₂; PM₁₀; PM_{2.5}; School children; SO₂