

## **Indoor air pollutants exposure and the respiratory inflammation (FeNO) among preschool children in Hulu Langat, Selangor**

### **ABSTRACT**

Background: Children's increased risk of respiratory diseases is possibly due to exposure to indoor air pollutants since they spend much of their time indoors. This study aims to determine the association between indoor air pollutants (PM<sub>10</sub>, PM<sub>2.5</sub>, and NO<sub>2</sub>) and respiratory inflammation among preschool children. Methods: A cross sectional comparative study was conducted among healthy preschool children selected from urban (n=129) and rural (n=141) area preschools in Hulu Langat District. Questionnaires were used to determine respiratory symptoms reported among respondents. Indoor exposure to PM<sub>2.5</sub> and PM<sub>10</sub> was measured using Dustrak DRX Aerosol Monitor, while LaMotte Air Sampler was used to monitor NO<sub>2</sub> in class. Fractional exhaled Nitric Oxide (FeNO) was measured by instructing respondents to exhale directly into the NIOX MINO device ('online' technique). Result: The median (interquartile range) concentration of PM<sub>2.5</sub> (63.0 (32) g/m<sup>3</sup>) and PM<sub>10</sub> (68.2 (31) g/m<sup>3</sup>) in preschools in urban area were slightly higher compared to the preschools in rural area (PM<sub>2.5</sub>= 55(37) g/m<sup>3</sup>; PM<sub>10</sub> = 62 (35) g/m<sup>3</sup>). A significant difference was found in NO<sub>2</sub> (p<0.01) measurements between the two areas. NO<sub>2</sub> was found to be significantly associated with Fractional exhaled Nitric Oxide (FeNO) measured in rural area (p<0.05). Conclusion: It was suggested that preschool children in urban area are highly exposed to indoor air particles compared to those from the rural area. The exposure to NO<sub>2</sub> was associated with Fractional exhaled Nitric Oxide in rural area suggesting that greater exposure may later influence children's respiratory health causing, particularly, inflammatory airways.

**Keyword:** Indoor air pollutants; FeNO; Respiratory symptoms; Preschool