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Title: 8-isoprostane in exhaled breath condensate (EBC) and air pollution exposure in children with wheezing

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Body: Background: Oxidative stress is proposed as the underlying mechanism of air pollutants aggression over the airways. 8-Isoprostane is a reliable biomarker of oxidative stress. 8-Isoprostane could be detected in several fluids including exhaled breath condensate (EBC). Objective: To study the relation between 8-isoprostane in EBC and air pollution exposure. Methods: In the scope of a prospective study, EBC samples were collected from 27 wheezing children in order to measure 8-isoprostanes. Children were also evaluated through spirometry and skin prick tests for airborne allergens. After the definition of a day activity pattern for each children and direct measurements of air pollutants in different microenvironments (home, school and outdoor), individual exposure was calculated for $PM_{10,}$ O_3, NO_2, xylene, toluene, benzene, formaldehyde and ethylbenzene. Spearman rank correlation was used to study the associations between 8-isoprostane and air pollutants. Results: The mean age of the studied children was 7.9 ± 1.1 years. Eleven were boys. The mean FEV_1 was 96.7 ± 9.6%. Ten of the studied children were atopic. Exposure to volatile organic compounds (VOCs) including toluene (rho = 0,604, p = 0,008), xylene (rho = 0,685, p = 0,002) and ethylbenzene (rho = 0,788, p<0,001) was correlated with 8-isoprostane concentrations in EBC. There were no correlations between EBC 8-isoprostane and $PM_{10,}$ O_3, NO_2 neither between EBC 8-isoprostane and spirometric results. Conclusions: Individual exposure to VOCs seems to be related with oxidative stress evaluated through 8-isoprostanes measurement in EBC. Granted by: Fundação Calouste Gulbenkian, SaudAr Project.