

Swimming and risk of asthma and allergies in Portuguese school aged children

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Suggestions of an increased asthma risk associated with swimming pool attendance have been made but evidence is conflicting.

We aimed to assess the impact of swimming pool attendance on lung function, airway inflammation, and risk of asthma and allergic diseases in Portuguese school aged children.

A cross-sectional survey in 348 children, aged 7 to 12 years, from 10 primary schools in Porto, was carried out from January to June 2014. Parents completed a questionnaire on demographics, environmental exposure, expiratory health and participants had lung function assessed by spirometry, airway inflammation by exhaled nitric oxide and atopy by skin prick tests. Final analysis included 269 children, aged 8.8 ± 0.9 years, 144 girls. The association between current swimming and health outcomes was evaluated using multivariate logistic regression models or chi-square test were appropriate.

No differences in prevalence of atopy (34% vs. 40%; $p=.471$), asthma (15% vs. 7%; $p=0.062$); allergic rhinitis (15% vs. 19%; $p=0.509$), and eczema/dermatitis (18% vs. 11%; $p=0.542$) were observed between current swimmers ($n=53$; 3.1 ± 2.8 hours/week.year of swimming pool cumulative exposure) and others ($n=216$). Lung function parameters (FVC, FEV1, FEF2575) were similar but significant differences in exhaled nitric oxide levels were observed (mean 95%CI: 24.9 ppb (15.7 to 34.2) vs. 14.7 ppb (12.0 to 17.5); $p=0.004$) after adjustment for atopy, height, weight and age, between current swimmers and others. Increased levels of exhaled nitric oxide remained significant even after excluding subjects with asthma from the analysis ((mean 95%CI: 18.0 ppb (12.5 to 23.6) vs. 13.7ppb (12.0 to 15.5); $p=0.018$).

The findings of our study are limited by its cross sectional nature and do not allow us to establish causal relationships. Nevertheless, swimming pool attendance was associated with non-pathological increased levels of airway inflammation assessed by exhaled nitric oxide independently of the presence of asthma.

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