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Title: The airways response to inhaled corticosteroid therapy in children with asthma exposed to environmental tobacco smoke

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Body: Background: Corticosteroids are the most effective anti-inflammatory therapy for asthma. A reduction in histone deacetylase (HDAC) activity is suggested to prevent the anti-inflammatory action of inhaled corticosteroids (IC). Cigarette smoke is known to reduce HDAC expression. Aim: To compare the lung function test parameters and the response to the IC in the asthmatic children exposed and not exposed to environmental tobacco smoke (ETS). Methodology: 527 children (6-16 years) with moderate to severe asthma performed spirometry before and after the 6 months of IC. According to questionnaire, we divided children into two groups: ETS exposed (ETSE, N 337) and ETS free (ETSF, N 190). Results: There were 49.9% of boys and 50.1% of girls (mean age 10.83). Average dose of Fluticasone dipropionate (FP) was 225.11±119.98 mcg per day per child. Among ETSE children, 208 were with one, 129 with both smoking parents, 228 had smoking mother and 238 had smoking father. ETSE children received statistically higher dose of FP, and dose of FP increased with increasing of number of smokers in the family (F=45.412, p<0.001). ETSE children had lower lung function parameters before and after the IC, and the influence of mother and both smoking parents on lung function was more pronounced then fathers alone. After the 6 months of IC, both groups of children significantly improved lung function tests, no difference between groups. Conclusion: ETS impaired the lung function growing rate in exposed children with asthma, but did not decrease response to inhaled corticosteroids. It is necessary to educate smoking parents to protect asthmatic children from tobacco smoke negative influence.