ASSOCIATION OF TUMOR NECROSIS FACTOR-a AND TRANSFORMING GROWTH FACTOR-b1 LEVELS WITH PULMONARY FUNCTION TEST IN CHILDREN WITH BRONCHIAL ASTHMA

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The aim was to study the relationship between tumor necrosis factor-α (TNF α), transforming growth factor- β 1 (TGF-β1) levels in blood and pulmonary function test (PFT) parameters in children with bronchial asthma (BA).

Methods: 124 children aged 5–17 years with BA were examined, of which 37 had intermittent BA (1st group), 46 mild persistent asthma (2nd group) and 41 moderate or severe persistent stage of BA (3rd group). Twenty seven healthy children were included in a control group. Levels of TNF- α and TGF- β1 in blood serum were measured by enzyme-linked immunosorbent assay. PFT was performed according to ATS/ERS Recommendations (forced expiratory volume (FEV1), vital capacity (VC)), respiratory resistance by forced oscillation (Rfo). Statistical analysis was performed with StatSoft Statistica Version 8.0.

Results: In BA exacerbation periods, TNF- α levels were significantly increased in the patients of 1st, 2nd and 3rd groups, compared with the control group ((109.52 (87.06; 126.45), 96.62 (83.52; 109.52) and 100.43 (77.89; 117.79) pg/ml compared with 23.55 (15.12; 31.05) pg/ml, respectively) (p<0.001).There were no differences in TNF- α levels in BA patients of the different groups (p > 0.05). TGF- β1 levels were significantly elevated in patients of 1st, 2nd and 3rd groups, compared with controls ((532.2 (341.9; 920.7), (1111.3 (705.2; 2374.2) and (590.5 (498.1; 942.7) pg/ml compared with 307.8 (268.8; 339.7) pg/ml, respectively) (p < 0.001).TGF- β1 level in 2nd group patients was significantly higher compared with the 1st (p < 0.0006) and 3rd groups (p < 0.00124). Multiple linear regression analysis showed TNF- α level in patients with BA in exacerbation was associated with FEV1, VC and Rfo (p < 0.05). There were no associations between TGF- β1 level and PFT parameters.

In BA remission, TNF-α levels were significantly increased in patients of all groups, compared with the control group. TGF- β1 levels were also significantly elevated in children of all groups, compared with controls. TGF- β1 level in 3rd group patients was significantly higher than in patients of the 1st and 2nd groups (p < 0.0086 and p < 0.0489, respectively).

Multiple linear regression analysis demonstrated that TNF- α level in patients with BA in remission was also associated with PFT parameters. Rfo, VC, FEV1 were significant in multiple linear regression (p < 0.001) for TGF- β1 in patients with BA in remission.

Conclusions: TNF- α level does not depend on BA severity and is associated with PFT parameters in the period of exacerbation and in remission. The significant increase in TGF- β1 level in remission and emergence of associations of TGF- β1 level with PFT parameters in remission may reflect its role in airway remodeling in children suffering from severe asthma.