Pulmonary hemodynamics and respiratory function associations in children with bronchial asthma

Dr. Oleksandr Onikiienko1, Prof. Dr Margaryta Gonchar1, Prof. Dr Ganna Senatorovva1, Dr. Valentyn Polyakov2, Dr. Oksana Tsyura1, 1Department of Pediatrics #1 and Neonatology, Kharkiv National Medical University, Kharkiv, Ukraine, 2Regional Children Pulmonological Center, Regional Children Clinical Hospital, Kharkiv, Ukraine.

Aim. To study the correlations between respiratory function and pulmonary hemodynamics in children with persistent asthma.

Material and methods. 85 children aged 7-16 years who had bronchial asthma were observed. The 1stgroup (1gr.) 37 children with mild persistent asthma, the 2ndgroup (2gr.) 48 with moderate to severe bronchial asthma. Examination was carried out in exacerbation and remission periods. Pulmonary hemodynamics was assessed by Doppler echocardiography. Pulmonary functions test was performed with pneumotachograph assessing next parameters: FEV1, MEF-50, common airway resistance by forced oscillation (RFO), resistance at expiration (RFO-ex) and inspiration (RFO-in). Statistical analysis was performed with StatSoft Statistica Version 8.0.

Results. Direct relation between indexes of the mean pressure of the pulmonary artery (PAP) and RFO has been established in the period of exacerbation (r=+0,67, p≤0,012 - 1gr. and r=+0,75, p≤0,001 -2gr.). Negative relation between MEF-50 and the diastolic diameter of the right ventricle (RVDD) of the 2gr. were significant (r=-0,56, p≤0,012). In the period of remission in all groups are saved direct correlations between parameters of RFO and PAP, especially with RFO-ex (1gr.r=0,743, p≤0,002; 2gr. r=0,76, p≤0,001). In the 2gr.were indicated direct relationships between RFO and RVDD (r=0,63, p≤0,001).

Conclusions. Correlations have been established between indexes of respiratory resistance, PLA and RVDD in exacerbation period in both groups. Same correlations remain in remission period in 2nd group of patients due to severe course of bronchial asthma and the possible remodeling of the pulmonary vessels and airways.