Key words: children, bronchial asthma, Helicobacter pylori infection, cytokines.

Introduction

The course of bronchial asthma in children is often accompanied by gastrointestinal diseases associated with H. pylori infection. The presence of H. pylori contributes to the activation and maintenance of inflammatory process in the digestive tract and bronchial mucosae with release of cytokines and mediators of inflammation.

Objectives: to study the peculiarities of IFN-γ and Il-4, -5 and -13 (IL4, IL5, IL13) production as they are markers of allergic inflammation intensity in children with asthma infected with H. pylori.

Materials and methods

120 asthmatic children of 6-18 y.o. were enrolled in the study. As criteria of BA control the recommendations of the Global initiative against asthma (GINA, 2014) were used. Identification of H. pylori infection was performed by determination of H. pylori Ig A by IEA (DAI "Microwell Elisa", USA), in case of positive result additional breathing "Helik-test" was performed (LLC "AMA", Russia). Serum concentrations of cytokines by IEA ("Diaklone", France) before and 7 days after treatment of gastrointestinal pathology. Statistical processing was performed using the methods of variation statistics implemented in the software package "STATISTICA 6.1".

Results

In 78 children with bronchial asthma pathology of the gastrointestinal tract was diagnosed, including 37 cases associated with H. pylori infection. To study the influence of H. pylori on the course of bronchial asthma children were divided into 3 groups: I - 37 children with bronchial asthma and gastrointestinal diseases, infected with H. pylori, II - 41 children with bronchial asthma and gastrointestinal pathology, H. pylori-negative, III - 42 children with bronchial asthma without pathology of gastrointestinal tract, H. pylori-negative. H. pylori infection was prevalent in children older than 11 years (72.9%) and was in direct ratio to asthma duration. Mean duration of asthma in group I was (7.8±0.17) years, in II – (5.9±0.26) years, group III – (3.9±0.48) years ($p<0.05$). In 56.8% of cases the presence of H. pylori infection was accompanied by destructive lesions of the gastrointestinal mucosa, in the absence of destructive lesions Helicobacter was detected only in 31,7 % of children ($p<0.05$).

According to the research results the presence of H. pylori infection did not significantly affect the parameters of asthma control, while contributing to deterioration of the prognosis of asthma due to increase in exacerbation rate requiring hospitalization, in comparison to children in whom the agent was not identified: ((2.27±0.13) hospitalizations a year and (0,73±0,1) cases per year respectively, $p<0.05$). The presence of H. pylori infection in children with bronchial

asthma was accompanied by lower concentrations of IFN-γ compared to children of group II (respectively (of 8.47±0.14) pg/ml and (9.69±0.32) pg/ml, $p<0.05$). The level of IL13 in serum was significantly higher in children of I group versus patients of group II ((8.74±0.22) pg/ml and (7,21±0,35) pg/ml, respectively, $p<0.05$). Serum concentrations of IL4 and IL5 were increased in all studied groups compared to the control group and had no correlation with the presence of H. pylori infection.

After treatment of gastrointestinal pathology improvement in asthma control was noted, which was accompanied by a significant reduction in serum concentrations of IFN-γ and IL13 in group I, and IFN-γ and IL5 and IL13 in group II.

Conclusion

The presence of H. pylori infection in children with gastroduodenal pathology, occurring against the background of bronchial asthma is accompanied by an imbalance of the immune response, which manifested as reduced production of IFN-γ and IL4, and IL13 increase compared to N. pylori-negative children. Treatment of gastrointestinal tract pathologies was accompanied by decrease in IFN-γ and the cytokines mentioned above and was clinically associated with improvement of asthma control.