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RISK FACTORS FOR CHRONIC CAGA-POSITIVE HP-ASSOCIATED GASTRITIS IN CHILDREN

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In this article risk factors of development of chronic gastritis caused by HP-infection in children are presented, analized and organized in order of importance and level of information.
Key words: chronic gastritis, HP-infection, risk factors, children.

Introduction

Diseases of the digestive system occupy a leading position in the overall structure of childhood diseases, yielding a prevalence of bronchopulmonary diseases. In recent years, inflammatory and destructive diseases of the upper part of the digestive tract in children are registered at an early age, increasingly have a long-standing recurrent course and lead to anatomico-functional changes of target affected organ and to the progression of complications [1, 5]. Almost in 50–96 % of cases the inflammatory diseases of the stomach and dodecadactylon are associated with Helicobacter (HP) infection [4]. Contamination of mucous coat of stomach with HP, according to data of many studies, is a factor of progression of chronic gastritis, an important factor in the pathogenesis of peptic ulcer disease, gastric adenocarcinoma and MALT-lymphoma [7, 8].

HP-infection is the most common chronic bacterial infections of a human being, more than 50 % of the world's population are contaminated with HP. [8] Child's contamination is possible at the first year of life, the prevalence of helicobacteriosis increases with age [5]. In the developing countries, nearly 80 % of children aged up to 10 years are infected with HP [9, 11]. Among the developed countries, this figure is significantly lower (27 %), but the growth trend of the number of infected is preserved with age [6, 10, 12].

Control and prognosis features of chronic gastritis progression are limited at present stage, which causes the necessity of the search for new highly informative methods of diagnosis and treatment, as well as the development of new scientifically grounded approaches to the control of this disease.

Work objective — is to identify the informative significant risk factors for the formation of HP-associated patholobiology in children with chronic gastritis.

Material and methods of the research

124 children aged 5–18 years with active chronic gastritis who were treated at the children's gastroenterology department of CCTH № 1 during 2009–2010 were under our supervision. To the main study group were included 64 HP-positive patients in the serum of which total antibody to the protein CagA-HP in titer from 1:5 to 1:80 with a positive breath test was detected. Comparison group consisted of 60 patients with negative results of ELISA and breath test.

EGC by the standard technique of biopsy of mucous coat of stomach and morphological examination of bioptate was conducted to all children who were under our supervision. For the diagnosis of HP-infection, the following methods: determination of total antibodies to CagA-HP protein in the serum (ELISA, «Vector-Best», Russia), respiratory Helic-test (LLC «AMA», Russia, St. Petersburg).

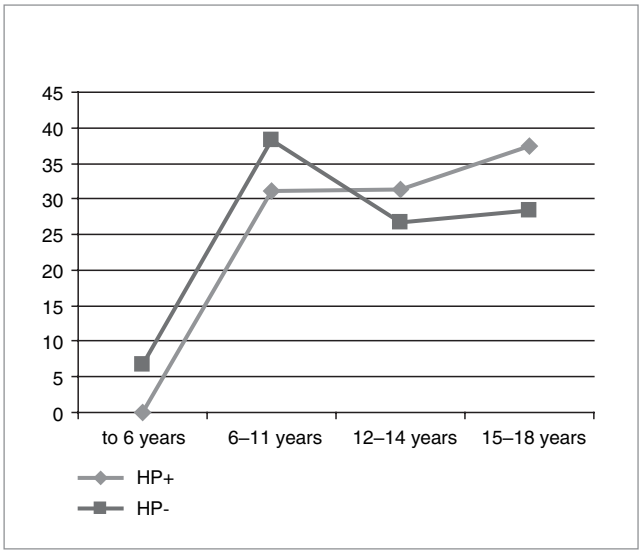

Fig. Frequency of HP-positive and HP-negative chronic gastritis in different age groups (%)

Table 1

Biological and social risk factors for the formation of HP-associated pathobiology

Risk factor	Relative risk	Diagnostic coefficient
Aggravated heredity for duodenal ulcer and chronic gastritis on the child's father side	7.61	+8.82
Low level of parent's work qualification	6.55	+8.16
Premature birth	4.84	+6.85
Cesarean delivery	4.84	+6.85
Transferred infectious diseases	4.69	+6.71
Lack of central water supply	4.69	+6.71
Prematurity	2.90	+4.63
Induced abortion	2.15	+3.33
Usage of unboiled water	2.11	+3.24
Early artificial feeding	1.97	+2.94
Birth body weight of 3 kg.	1.67	+2.22
Low level of parents education	1.67	+2.22
Unsatisfactory level of family incomes	1.54	+2.0

Table 2

Structure of endoscopic changes of mucous coat of stomach in patients with chronic gastritis (%)

Character of changes of mucous coat of stomach	Studied group	
	main (HP+)	Control (HP-)
Erythematous gastropathy	73	86
Hyperplastic gastropathy	17	7
Erosive gastropathy	10	7

Table 3

Clinical and endoscopic features of HP-associated gastric pathobiology in children

Risk factor	Relative risk	Diagnostic coefficient
Disfunction of the cardia	4.69	+6.7
Duration of dyspeptic syndrome over 4 days	3.60	+5.56
Associated pathology of gall bladder	2.81	+4.49
Duration of pain syndrome for more than 5 days	2.74	+4.38
Hyperplastic gastropathy	2.58	+4.11
Unstable stool	2.34	+3.70
Significant asthenic-vegetative disorders	2.11	+3.24
Diffuse lesion of mucous coat of stomach	2.07	+3.16
Presence of water brash	1.53	+1.86

Statistical processing of the results of the research was conducted using the computer programs: «Statgraf», «Matstat». Significance of differences in the case of normal distribution of data was evaluated using Student's t-test, in the case of distribution that differs from normal, Mann—Whitney test is applied. Informativeness of the researched features was assessed by the Kulback's criterion, considering the difference in the frequency of specific feature in the two comparison groups (in this case HP-positive and HP-negative patients) and calculation of the diagnostic coefficient of the relative risk for the studied feature.

Trial Results and Their Discussion

Analysis of gender differences showed inaccurate (pu>0.05) predominance of boys in the main study group in comparison with control group (respectively 54.7% and 43.3%). Average age of the patients of the main group was 12.6±0.4 year, of comparison group — 11.5±0.5 years (pu?0.05). The frequency of gastric pathobiology associated with HP, was similar and relatively high in children aged 6–11 and 12–14 years (respectively 31.2% and 31.3%) and reached the maximum level in adolescence (37.5%) which coincides with the findings of other authors [1,3,9]. In the overall structure of HP-negative patients the proportion of children under 6 years was minimal, which amounted to 6.7%, and the proportion of children of 6–11 years was the highest — 38.3% (fig.).

Conducting of this study allowed to identify the factors of high significance (relative risk (RR)>2.0) and additional factors (1.5<RR<2.0) associated with HP-

infection in children ($p<0.05$). According to our data, the biological factors of high importance are: aggravated heredity for duodenal ulcer and chronic gastritis mainly on the child's father side; feto-maternal disease and childbearing (induced termination of pregnancy, premature birth and Cesarean delivery), prematurity, transferred infectious diseases (measles, rubella, scarlet fever). Significant social risk factors are poor sanitary conditions of child's life — the lack of central water supply and the use of unboiled water (table 1).

The clinical picture of the disease in children of the main group showed more prolonged and intense pain and dyspeptic syndromes, the presence of significant asthenic-vegetative disorders, more ponderable part of overweight children (RR=2.5), comorbidity of nephros (RR=5.6) and disorders of the musculoskeletal system (RR=2.81) in comparison with the control group. Among HP-positive patients in 17% of cases the hyperplastic gastropathy was endoscopic registered and among HP-negative patients — in 7% of cases (table 2), also in the Hp-positive patients more frequently the diffuse lesion of mucous coat of stomach or a combination of damage of antral part and body of the stomach were observed.

Clinical and endoscopic features characteristic for HP-associated gastric pathobiology in children are given in the table 3.

Conclusions

Thus, among the risk factors of the formation of HP-associated gastritis in children of a high importance and informativeness are: aggravated heredity for duodenal ulcer and chronic gastritis mainly on the child's father side; feto-maternal disease and childbearing, prematurity, early artificial feeding, transferred infectious diseases, the lack of central water supply, the use of unboiled water, presence of comorbidity of nephors, gall bladder and musculoskeletal system, hyperplastic changes of mucous coat of stomach.

Based on these data we created a mathematical model of prediction of HP-associated gastritis in children, which enables to detect with high sensitivity and specificity the high-risk group for the development of HP-associated gastric pathobiology in children.

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