

Detection of helicobacter pylori in pediatric patients with adenotonsillar hypertrophy

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Abstract

Background: Adenotonsillar hypertrophy is one of the most prevalent causes of upper airway obstruction in pediatric patients. Recent studies have shown contradictory findings about helicobacter pylori colonization in adenotonsillar tissue and its role on adenotonsillar hypertrophy. According to this, we decided to investigate relationship between helicobacter pylori colonization and adenotonsillar hypertrophy.

Methods: This is a comparative study in otorhinolaryngology department of Amir Almoemenin hospital in Semnan. In this study, pediatric patients with adenotonsillar hypertrophy (n=50) were compared with control group (n=50) in terms of H. pylori colonization in adenotonsillar tissue. All of them were examined by urease breath test (UBT). Adenoid and tonsil biopsy specimens (in 30 patients with adenotonsillectomy) were collected and underwent the RUT for investigating colonization of Helicobacter pylori.

Results: Fourteen percent of patients with adenotonsillar hypertrophy and 20% of control were found helicobacter pylori infection. There was no significant association between helicobacter pylori and adenotonsillar hypertrophy (odds ratio: 0.65 with confidence interval: 0.2-2.09).

Conclusion: This study showed lack of relationship between adenotonsillar hypertrophy and Helicobacter pylori. However, more studies and samples are needed to provide a definitive judgment.

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Introduction

Helicobacter pylori (H. pylori) is a gram-negative bacterium that uses main enzymes such as urease, catalase and lipase cause chronic infection in gastrointestinal mucosa (1, 2). Epidemiologically, the prevalence of H. pylori infection is different worldwide. In developing countries are higher than developed countries (3). The method of H. pylori detection are various, which include directly investigate on tissue sample: Histology, rapid urease test and polymerase chain reaction, indirectly methods: serological tests and urea breath test (3, 4, 5).

Recently, multiple studies have showed that the oropharynx can be a reservoir for H. pylori and this microorganism may colonize on tonsillar and adenoid tissues (6, 7).

Adenotonsillar tissue is a part of pharyngeal lymphoid tissue (6). Hypertrophy of this tissue can cause recurrent tonsillitis and airway obstruction that may indicate adenoidectomy and tonsillectomy. These surgeries are the most common major operations that were done on pediatric patients (8).

The aim of this study was to investigate the association between adenotonsillar hypertrophy and H. pylori colonization in this site.

Patients and Methods

This comparative study was conducted at otorhinolaryngology department of Amir Almoemenin hospital, Semnan University of Medical Sciences, Semnan, Iran. The ethic committee of Semnan University of Medical

Sciences approved it. The using convenience sampling, 100 pediatric patients were included in this study, so that 50 pediatric patients were referred to otorhinolaryngology clinic due to complications of adenotonsillar hypertrophy (ATH) and were undergone adenotonsillectomy based on clinical indications under general anesthesia. The comparative group (n=50) were children referred to general pediatric clinic in the same of hospital. They had no ATH on examination. Two groups were matched in terms of age and sex. The exclusion criteria were patients receiving any of antibiotic therapy and anti-secretory therapy in one month before, prior history of head and neck surgery and chronic systemic diseases or anatomical disorders.

Informed consent was obtained from parents of children for participating in this study. All patients were investigated by urea breath test (UBT). This test is a diagnostic method for detecting active infection of *H. pylori*. A capsule containing urea made from an isotope of carbon was swallowed by the pediatric patients and then evaluated the presence of isotopic carbon in the exhaled carbon dioxide. In order to detect *H.pylori* colonization in adenotonsillar tissue, samples were taken from adenoid, the right and left tonsil in 30 patients. The samples were tested with rapid urease test (RUT) and were examined after 1 and 24 hour at room temperature. A red-pink color change in urea solution was considered positive result. SPSS 16 carried out data analysis. The mean and standard deviation was used for age. Chi-square and independence t-test were considered for qualitative and quantitative data respectively. The odds ratio was calculated for determination relationship between *H. pylori* infection and ATH. The confidence level was fixed 95%.

Results

Of 100 investigated patients (male: 64, female: 36), 50 patients were in each group. There are no significant difference age ($p=0.237$) and sex ($p=0.405$) between groups. To detect *H. pylori* infection UBT was performed in all patients. Seven (14%) patients in ATH group and 10 (20%) patients in control group had positive results that there was no statistically significant relationship between hypertrophic adenotonsillar and *H. pylori* infection ($p=0.424$, odds ratio: 0.65 with confidence interval: 0.2-2.09) (table 1).

Table1: The results of the comparison between pediatric patients with and without adenotonsillar hypertrophy.

Variable	ATH Group (n=50)	Without ATH Group (n=50)	P-value
Age (Mean±SD years)	8.9±2.6	8.6±2.8	0.237
Gender			
Male (n, %)	34(68%)	30(60%)	0.405
Female (n, %)	16(32%)	20(40%)	
Helicobacter.pylori infection			
Positive UBT	7 (14%)	10 (20%)	0.424
Negative UBT	43(86%)	40(80%)	

ATH: adenotonsillar hypertrophy, UBT: urea breath test
Variables were compared by chi square test (except age was used independence -t test) The significant level was less than 0.05.

Ninety tissue samples were taken in adenotonsillectomy (right tonsil: 30, left tonsil: 30 and adenoid: 30) were investigated with RUT. This test was conducted for each separate sample. Only 6 tonsil samples (10%) and 8 adenoid samples (23.3%) were identified, so 9 patients (18%) in ATH group were demonstrated positive RUT.

Discussion

Helicobacter pylori is one of the most common bacterial infections in human and its discovery returns to 1983. Its prevalence is difference worldwide, because various agents can affect *H. pylori* colonization, which the most important include socioeconomic condition, genetic, usage of antibiotics. The prevalence is almost 40% in developed countries and 80% in developing countries (8, 9, 10). This gram-negative, microaerophilic bacterium has a known relationship to some gastrointestinal diseases such as peptic ulcers and gastritis (3, 8). The presence of *H. pylori* has been reported in extra gastrointestinal system. Some studies have shown it in middle ear effusions, oropharyngeal diseases and adenotonsillar tissue (1, 8, 11, 12). Also a study found decreasing *H. pylori* colonization in gastric antrum after tonsillectomy patients (13). Adenotonsillar hypertrophy is a common problem in children that cause upper airway obstruction and associated complications. In some cases due to chronic tonsillitis and respiratory disturbance, it needs surgical treatment. The pathophysiology of ATH is unclear and agents such as gastroesophageal reflux and extraesophageal reflux are

suspected (3, 4, 14). In addition, the studies were investigated about the role of *H. pylori* for ATH (4, 15,16). Our results the similarity to some studies found statistically no significant relationship between *H. pylori* and ATH (2,11,12,18). We found odds ratio less than 1 so that in a systematic review was found higher than 1 that had statistically no significant relation (5). In our study, the positive result of RUT was 18% like vaysoglu et al. study and wibawa et al. study that were unremarkable. However, in unver et al. study reported 57.9% (12,17,19). These results were based on diagnostic tests, which the accuracy is questionable. There is no golden standard test for detecting oral *H. pylori*. It is important to know that detect of *H. pylori* in oropharyngeal and especially its culture is difficult (20). Because the microorganisms' oropharyngeal can produce urease, so may induce false results. On the other hand all diagnostic tests for *H. pylori* are standardized for detecting gastric *H. pylori*. Therefore, it is recommended to use more accurate diagnostic tests for detecting *H. pylori* in larger samples.

Conclusion:

This study showed lack of relationship between adenotonsillar hypertrophy and *Helicobacter pylori*. It is necessary to design and conduct follow-up studies using more accurate diagnostic tests in adequate sample size for supporting this result.

Conflict of Interest:

The authors declared no Conflict of Interests.

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