ORIGINAL ARTICLE

Helicobacter pylori Prevalence in Pediatric Patients in Kırşehir Region

Kırşehir Bölgesinde Çocuk Hastalarda Helicobacter pylori Sıklığı

Fikriye Milletli Sezgin [1], Rukiye Nar [2], Ülken Tunga Babaoğlu [3], Bilal İlanbey [4]

ABSTRACT

Purpose: Helicobacter pylori (H. pylori) is a common pathogenic bacteria and related on etiology of chronic gastritis, peptic ulcer and intestinal metaplasia. The aim of this study is to investigate the prevalence of H. Pylori infection in the pediatric population in the Kirsehir region.

Materials and methods: H. pylori antigen prevalence in stool samples of 1083 pediatric patients with various gastrointestinal complaints who had admitted pediatry department of Ahi Evran Unıversity Training and Research Hospital were evaluated by Helicobacter pylori stool antigen (HpSA) test in the study.

Results: Of the 1083 children, 82 (7.6%) were positive for HpSA. HpSA positivity was %8 (44/546) in males and %6.8 (38/537) in females. There was no significant statistical difference between sexes in terms of H. Pylori positivity (p=0.304).

Conclusion: H. pylori antigen prevalence in pediatric patient was lower than the studies published before in Kirsehir. In our opinion that more extensive research needs to be done using gold standard tests.

Keywords: Child, Helicobacter pylori, stool antigen test.

ÖZET

Amaç: Helicobacter pylori (H. pylori) yaygın bir patojen bakteri olup, kronik gastrit, peptik ülser ve intestinal metaplazi etiyolojisinde rol oynamaktadır. Bu çalışmada Kırşehir bölgesinde yaşayan çocuk hastalarda H. pylori sıklığının belirlenmesi amaçlanmıştır.

Materyal ve Metod: Ahi Evran Üniversitesi Eğitim ve Araştırma Hastanesi çocuk hastalıkları polikliniğine çeşitli gastrointestinal yakınmalarla başvuran 1083 çocuk hastanın dışkı örneklerinde H. Pylori antijen varlığı H. Pylori dışkı antijen testi ile araştırıldı.

Bulgular: 1083 çocuk hastanın 82' sinde (%7.6) H. Pylori dışkı antijen pozitifliği belirlendi. HpSA pozitifliği erkeklerde %8 (44/546) iken kızlarda %6.8 (38/537) idi. HpSA pozitifliği açısından cinsiyetler arasında istatistiksel olarak fark yoktu (p=0.304).

Tartışma: Kırşehirde çocuk hastalarda H. pylori sıklığı diğer çalışmalara göre daha düşük bulunmuştur. Tanıda altın standart testlerin kullanılarak daha kapsamlı araştırmaların yapılmasının gerektiğini düşünmekteyiz.

Anahtar kelimeler: Çocuk, Helicabacter pylori, dışkı antijen testi.

Gönderilme tarihi: 15.5.2017; Kabul edilme tarihi: 4.7.2017

[1]Department of Medical Microbiology, Ahi Evran University School of Medicine, Kırşehir, Turkey

[2]Department of Medical Biochemistry, Ahi Evran University School of Medicine, Kırşehir, Turkey

[3] Department of Public Health, Ahi Evran University School of Medicine, Kırşehir, Turkey

[4]Department of Medical Biochemistry, Ahi Evran University Training and Research Hospital, Kırşehir, Turkey

Sorumlu Yazar: Fikriye MİLLETLİ SEZGİN, fikriye.sezgin@ahievran.edu.tr

INTRODUCTION

Though prevalence of infection in children is lower than adults, the role of Helicobacter pylori in duodenal ulcer and primary antral gastritis has been identified. H. pylori is a bacterium that is gram-negative, spiral-shaped, and unipolar with a large number of flasks and easily passes into the stomach mucus layer (1, 5). Especially in developing countries people are infected with this bacterium in early ages and continue to live with it unless it is treated. In older ages, H. pyloriis is responsible for the development of stomach cancer, mucosal lymphoid tissue (MALT) lymphoma (2. 3).

Although transmission routes of H. pylori are not known precisely, factors such as poor living conditions, poor hygiene conditions, low socio-economic status, malnutrition, 0 blood group, low education level of mother are considered to be risk factors in terms of bacteria's entry into the body. The fact that people living in crowded areas with poor hygiene conditions have more frequent H. pylori infection supports the idea that it is transmitted via fecal-oral way (4).

Invasive and non-invasive tests are performed in the diagnosis of H. pylori infections. Bacterial reproduction from culture in the sample taken via biopsy and endoscopy as an invasive test or histopathological presentation of bacteria are gold standard methods. Rapid urease test can also be performed with biopsy sample (5). However, biopsy based invasive methods may not be preferred due to the difficulty of application in children, cost and labor. Non-invasive tests are specific serum anti-H. Pylori IgG test, urea breath test and stool antigen test. H. pylori-specific IgG positivity may continue to exist in 50-60% of the patients after treatment of the infection or in cases when the bacteria cannot be eradicated with treatment or it continues to exist spontaneously. Therefore, the test's usefulness in the differentiation of acute, chronic or previous H. pylori infections and monitoring of the response to treatment is limited. Since seropositivity is high in our country, the results of this test should be evaluated together with clinical findings and other diagnostic methods. However detecting H. pyloriIgG is significant for eradicating the infection. Since the practice of urea breath test requires special equipment, radioactive substance and it is expensive, its application in routine is limited. In recent years H. pylori antigen test in stool has become useful since it is easy, cheap and practical and it can be easily performed for children and in cases when urea breath test cannot be performed. This test is used routinely in many laboratories of hospitals. H. pylori antigen positivity in stool can be detected early in the infection and becomes negative with treatment, which is why this test is quite useful in monitoring of the response to treatment (6). There are a number of studies in literature indicating that it is safe to use this test which has high sensitivity and specificity (7). In this study it is aimed to examine the results of retrospective evaluation of H. pylori antigen test in the stool specimens of pediatric patients applied to our hospital's pediatric outpatient clinic with a variety of clinical complaints and it is also aimed to detect the prevalence of H. pylori.

MATERIALS AND METHODS

The results of 1083 fresh stool samples of different patients sent from pediatric outpatient clinic with stool antigen test request between July 2014 and December 2016 were examined retrospectively. The first examination of stool antigen of each patient upon the admission to the hospital was included in the study. Helicobacter pylori ag test (Rds, Turkey) which is a rapid test was used in our study. The working principle of the test is immunochromatographic method. This method is also called lateral flow because the labeled antigen or the antibody flows along the membrane after binding to its specific analyte in the test process. Monoclonal antibodies formed against H. pylori antigen were conjugated and immobilized in the nitrocellulose membrane test zone. If the H. pylori antigen is present in the stool samples, it interacts with antibody by the conjugate-bound and it is caught by immobilized antibodies after moving to this complex test zone. A visible red line (test band) which is a sign of positive result is formed. If the H. pylori antigen is not present in the sample, there will be no red line in the test zone. After the test is run, there should always be a control line (C) in the control zone. Absence of a colorful control line in the control zone shows that the test is invalid. In the test procedure, there should be a plastic bottle with a buffer solution within and a test card on which the reaction is monitored. Stool samples taken from the patient were at the size of lentils and they were taken from different parts of the stool. The bottles were opened from the screw. The bottles with screws were closed tight. The extraction buffer in the bottle was strongly shaken up in order to mix it the sample and was vortexed for 15 seconds. The test card was removed from the bag. The top end of the plastic bottle was broken and opened, 4 drops were added to the gap at the edge of the test card. The results were obtained 5 minutes later. All statistical analyses were done using SPSS version 20 software (SPSS Inc., Chicago, IL, USA).

RESULTS

Records of total 1083 pediatric patients were examined retrospectively. 537 (49.6%) of the patients were female and 546

(50.4%) of them were male and also their age average was 4,80±4,47 years. Prevalence of H. pylori in the whole group was found to be 7.6%.. H. pylori stool antigen (HpSA) positivity was 8% (44/546)in males and 6.8% (38/537) in females. There was no significant statistical difference between sexes in terms of H. pylori positivity (p=0.304). No relation was found between H. Pylori (+) and age groups. The ratio was 7.02% (49/698) in ages between 1-5, 8.6% (19/220) in ages between 6-10 and 8.4% (14/165) in ages between 11-18 (p=0.384).Table 1 and 2 shows the distribution of HpSA positivity according to sex and age respectively.

		Result			
		H. pylori (+)		*H. pylori* (-)	
		n	%	N	%
Sex	Female	38	6.8	499	93.2
	Male	44	8	502	92
	Total	82	7.6	1001	92.4

Table 1. Relation between H. pyloriseroprevalence and sex

DISCUSSION

Helicobacter pylori is a common pathogen in our country as it is in the whole world. H.pylori, which plays an important role in etiopathogenesis of various upper gastrointestinal system diseases such as peptic ulcer, chronic gastritis, gastric adenocarcinoma and MALT (mucosa-associated lymphoid tumor) lymphoma and considered to be carcinogenic in humans (8).

For this reason, it is a serious problem in terms of community health. Accurate and rapid diagnosis of H. pylori increases the likelihood of treatment. It is difficult to apply invasive methods in children. Since stool antigen test is not an invasive method, it is commonly preferred. The test is cheap, simple easy to apply. It has the advantage that it can be used in all ages for before and after treatment follow-up and for screening. In a study, histopathology and urea breath test and stool antigen test results were compared and a high rate of sensitivity (100%) and specificity (97%) was detected (9). In a study conducted in Italy, HpSA test was compared to culture and histopathology which are invasive methods and sensitivity, specificity predictive positive value (PPV) and predictive negative value(PNV) were found to be 100, 97.4, 91.8, 100% respectively (10).

Also in other studies, when this test was compared with invasive methods, the results were parallel (11,12,13).

		Result (%)			
		Positive		Negative	
		n	%	n	%
Age Group	Age 1-5	49	7.02	649	92.08
	Age 6-10	19	8.6	201	91.4
	Age 11-18	14	8.4	151	91.6

Table 2.Relation between H. pyloriseroprevalenceand age groups

The age at which H. pylori infection is acquired varies among communities. In some regions it is seen frequently under age 10 and an increase is observed in the frequency of infection with age (14).

In European based studies H. pylori prevalence is lower and the rate is 7-87% around the world (15). Mitchell et al. (13) found H. pylori prevalence 44% in South China and indicated that this rate is 21% in Austrian children (16).

Especially in developing countries, low socio-economic level and poor living conditions in a crowded population make it easy for this pathogen to spread in the childhood (17).

Prevalences in the studies conducted in Turkey using HpSA were ranged between 36% and 61%. But we see that this rate is relatively lower in our western regions (13, 18, 19, 20,).

H. pylori prevalence we found using stool antigen test is lower than other researchers' data in our region. In a 2010 study conducted in our region, the rate was found to be 16.6% in ages 1-9 and 25% in ages 10-19 (21). In this study we conducted, H. pylori antigen prevalence in ages between 1-18 was determined to be 7.6%. It has been emphasized that the prevalence has fallen in a study conducted in the Erzurum region (22). It is quite gratifying that the prevalence has fallen. We believe that positive developments in socio-economic level, increased education level and complying with hygiene conditions may have caused the prevalence to fall. In developed countries, the prevalence of H. pylori infection has declined rapidly in the last 50 years, with the abolition of the factors for the spread of H. pylori infection. It is known that decreasing the prevalence of H. pylori affects the incidence of these pathogen-related diseases. The incidence of gastric cancer can be reduced by diagnosis and treatment at an early age.

As a conclusion, the prevalence of H. pylori in children in our region was determined to be low. However, since we do not have the data of socio-economic level, nutrition habits and hygiene conditions that can explain the exact reasons of the decline in the prevalence, we think that this is the limitation of our study. Further and more comprehensive studies are needed to support this data.

REFERENCES

1. Koneman EW, Allen SD, Janda WM, Schreckenberger PC, Winn WC. Color Atlas and Textbook of Diagnostic Micro¬biology. 6th ed. Philadelphia: Lippincott-RavenPublishers; 2006: 403-408.
2. Czinn SJ. Helicobacter pylori infection: Detection, investigation,and management. J Pediatr. 2005;146: S21-S26.
3. Uemura N, Okamoto S, Yamamoto S, Matsumura N, Yamaguchi S, Yamakido M, et al. Helicobacter pylori infection and the development gastric of cancer. N Engl J Med. 2001;345: 784-789.
4. Özkan TB. Çocuklarda Helicobacter pylori enfeksiyonunda seroloji, tanı ve tedavi. Uludağ Üni Tıp Fak Derg. 2007;33:81-85.
5. Arslan D, Tahan F, Demir F, Taşkın İ. Erciyes Üniversitesi Tıp Fakültesi Çocuk hastalıkları polikliniğine başvuran sağlıklı çocuklarda Helicobacter pylori enfeksiyonunun seroprevelansı ve bunu etkileyen faktörler. Erciyes Tıp Dergisi (Erciyes MedicalJournal). 2006;28 (4): 192-196.
6. Us AD. İşaretli katı faz yöntemleri. Temel İmmünoloji ve Seroloji. Ankara: Hipokrat yayınevi; 2016. 158.
7. Özdemir M, Kalem F, Dostbil Z, Taştekin G, Baykan M, Baysal B. Dispeptik Hastalarda Gaita Antijen Testinin Tanı Değerinin Üre Soluk Testi İle Karşılaştırılarak Araştırılması. Kocatepe Tıp Dergisi. 2007;8(2):25-28.
8. Dunn B E, Cohen H, Blaser M J. Helicobacter pylori. Clinical microbiology Reviews. 1997; 720–741.
9. Bosso S, Balbo L, Lerro P, Kuvidi M, Musso A, Ansaldi. Antigen detection in stools as a first choice for laboratory diagnosis of Helicobacter pylori disease. Minerva Gastroenterol Dietol. 2000;3;46(1): 15-18.
10. Peri F, Quitadamo M, Ricciardi R, Piepoli A, Cotugno R, Gentile A, et al. Comparison of a monoclonal antigen stool test (HpStAR) withthe 13C-urea breath test (UBT) in monitoringHelicobacter pylori eradication therapy. World J Gastroenterol. 2005;11(37):5878-5881.
11. Inelmen EM, Maccari T, Enzi G, Gasparini G. Helicobacter pylori infection diagnosis in hospitalized elderly patients: the stoo lantigen test (HpSA) in comparison with other methods. AgingClinExpRes. 2004;16(5):349-355.
12. Li Y, Guo H, Zhang P, Zhao XY, Da SP. Clinicalvalue of Helicobacter pylori stool antigen test, ImmunoCard STAT HpSA, fordetecting H pyloriinfection. World J Gastroenterol. 2004;10(6):913-914.
13. Özdemir M, Baykan M. Dispeptik hastalarda Helicobacter pylori infeksiyon tanısında Helicobacter pylori gaita antijeninin tanı değerinin incelenmesi. Genel Tıp Dergisi. 2005;15(2):65-70.
14. De Giacomo C, Valdambrini V, Lizzoli F, Gissi A, Palestra M, Tinelli C, et al. A populationbased survey on gastrointestinal tract symptoms and Helicobacter pylori infection in children and adolescents. Helicobacter. 2002; 7: 356-363.
15. Ford AC, Axon AT. Epidemiology of Helicobacter pylori infection and publichealth implications. Helicobacter. 2010;15(1):1-6.
16. Mitchell HM, Li YY, Hu PJ, Liu Q, Chen M, Du GG, et al. Epidemiology of Helicobacter pylori in southern China: identification of early childhood as the critical period for acquisition. J InfectDis. 1992;166(1):149-153.
17. Glassman MS. Helicobacter pylori infection in children. A clinicaloverview. Clin Pediatr (Phila). 1992;31:481-487.
18. Doğan Y, Barış S, Erkan T, Önal Z, Usta M, Çokuğraş F, et al. Çocuklarda Helicobacter pylori enfeksiyonu: yakınma, endoskopik bulgu, tanı yöntemleri ve tedavi sonrası eradikasyon oranlarının değerlendirilmesi. Türk Ped Arş. 2007; 42: 98-102.
19. Örmeci AR, Hekimoğlu Ü. Kronik karın ağrılı çocuklarda Helicobacterpyloriinfeksiyonu: Prevalans, tanı, tedavi ve risk faktörleri. Çocuk Dergisi. 2003; 3: 144-150.
20. Büyükbaba-Boral O, Küçüker-Anğ M, Aktaş G, İşsever H, Anğ Ö. HpSAfeco prevalence in patients suspected to have Helicobacter pylori infection in Istanbul, Turkey. Int J InfectDis. 2005; 9: 21-26.
21. Demir T, Turan M, Tekin A. Kırşehir bölgesindeki dispeptik hastalarda Helicobacterpylori antijen prevalansı. Dicle Tıp Dergisi. 2011;38(1):44-48.
22. Çiftel S, Okçu N, Dursun H, Albayrak F, Usta S. Bölgemizde Helicobacterpylori sıklığı. Akademik Gastroenteroloji Dergisi. 2016;15(1):1-4.