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Association of *Helicobacter pylori* and Giardiasis in Children with Recurrent Abdominal Pain

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SUMMARY: The aim of this study was to examine the frequency and the relationship of *H. pylori* infection and giardiasis in children with recurrent abdominal pain. The study group included 98 patients and 88 healthy controls. Patients' sera were examined for anti-*H. pylori* specific IgG antibodies using *H. pylori* IgG ELISA. Analysis of stool samples was carried out by the *H. pylori* stool antigen (HpSA) enzyme immunoassay. For the diagnosis of giardiasis, all stool samples were examined by saline-Lugol and formalin-ethyl-acetate sedimentation methods. *H. pylori* was detected in 40 (49.0%) patients and 40 (45.5%) controls. *G. intestinalis* was detected in 30 (30.6%) patients and 18 (20.4%) controls. There was no significant difference in frequency between the groups in the distribution of *H. pylori* (p=0.6) and giardiasis (p=0.4). The frequency of the combination of *H. pylori* infection and giardiasis in the patient groups was 22.4% compared to 6.8% in the control groups and this result was statistically significant (p=0.002). It seems that the relationship of *H. pylori* infection and giardiasis represent an important ethiologic factor in children with recurrent abdominal pain.

Key Words: Recurrent abdominal pain, giardiasis, *H. pylori* infection

Rekkürren Karın Ağrısı Olan Çocuklarda *Helicobacter pylori* ve Giardiasis Birlikteliği

ÖZET: Rekürren karın ağrılı çocuklarda, *Helicobacter pylori* (*H. pylori*) enfeksiyonu ve giardiasis en yaygın iki organik nedendir. Bu çalışmanın amacı rekürren karın ağrısı olan çocuklarda *Helicobacter pylori* ve *giardiasis* birlikteliğinin sıklığını göstermektir. Çalışmaya 98 semptomatik ve 88 sağlıklı kontrol olgu alındı. Hastalardan elde edilen serumda anti- *H.pylori*-spesifik IgG antikorları ELISA yöntemi ile araştırıldı. *H.pylori* için dışkı örneklerinin analizi *H. pylori* stool antigen (HpSA) enzyme immunoassay yöntemi ile bakıldı. Giardia için dışkı örneklerinin incelenmesi salin-lugol ve formalin-etil-asetat sedimantasyon metodu ile yapıldı. *H. pylori* hastalarının 40 (%49)'ında, kontrol olgularının da 40 (%45,5)'ında saptandı. *G. intestinalis* hastaların 30 (%30,6)'unda, kontrol olgularının 18 (%20,4)'inde saptandı. İki grup arasında *H. pylori* (p=0,6) ve giardiasis (p=0,4) sıklığı açısından istatistiksel olarak anlamlı bir fark saptanmadı. Fakat *H. pylori* ve giardiasis birlikteliği, hastalarda %22,4 olarak bulunurken kontrol grubunda %6,8 olarak bulundu ve iki grup arasındaki fark istatistiksel olarak anlamlı saptandı (p=0,002). Bu bulgu rekürren abdominal ağrılı çocuklarda *H. pylori ve* giardiasis birlikteliğinin etyolojide rol oynayabileceğine işaret etmektedir

Anahtar kelimeler: Rekürren karın ağrısı, giardiasis, *H. pylori* infeksiyonu

INTRODUCTION

Recurrent abdominal pain (RAP) is one of the most common complaints of childhood. RAP is defined as at least three episodic attacks of abdominal pain over at least three months that are severe enough to affect the usual activitiy of the child. The prevalence of RAP in children ranges between 10-20% (1, 11). The incidence of organic and non-organic causes of RAP are variable in different studies (2, 12, 25, 26). Organic causes like *Helicobacter pylori* (*H. pylori)* infection, cholelithiasis and parasitic infections have also been reported (3, 27).

Two important factors for *H. pylori* and g*iardiasis* playing role on RAP ethiology, both are transmitted by oral-fecal ways. *H. pylori* that is acquired in the developing countries at very early ages is comperatively common up to 80-90% (27). *H. pylori* and intestinal infections frequencies and giardiasis especially at young children are comperatively common in Sanliurfa (24, 30). Even though the predisposition effects of giardiasis and *H. pylori* infections to each other were reported, there is no study concerning the association of *H. pylori* and giardiasis on the children with RAP. For this reason, after the other reasons were excluded, we aimed to evaluate the frequency of association of giardiasis and *H. pylori* and it's role on RAP ethiology.

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MATERIAL AND METHODS

This study included 98 children with RAP and 88 healthy control groups similar age and gender. All patients were recruited from the first admitted centers to randomised the patient groups. Control group were recruited from the same centers who came for vaccination as healty subjects.

Abdominal pain was asked mothers and/or children. RAP defined by the presence of nonorganic abdominal pain in children qualified by at least three episodes of abdominal pain, weekly episodes of abdominal pain, and/or a symptom duration of at least 3 months used by Apley and Naish (1). A detailed history of similar pain in the family members, treatment received outside, school absenteeism and nocturnal pain was recorded in a proforma. Other causes of pain abdomen were ruled out by doing hemoglobin, total leukocyte count, differential count, peripheral smear, mantoux test, hepatitis B surface antigen, ultrasonography of abdomen, microscopy examination of stool samples, urine routine examination and microscopy, and nocturnal smear for microfilaria. The patient's stool was measured for *H. pylori* antigens for epidemiology or differential diagnosis of abdominal pain. Serum and stool samples were frozen at -20^0C until assayed for diagnosis of *H. pylori*. Antibodies to *H. pylori* were examined using an *H. pylori* IgG ELISA (Euroimmun, Germany). All samples were measured using the manufacturer's instructions. Analysis of stool samples was carried out by the HpSA ELISA (Meridian, USA), used according to the manufacturer's instructions. Samples were read by spectrophotometry (450/630) with cut-off values of: less than 0.100 was considered negative, 0.100-0.119 was undetermined, and greater than or equal to 0.120 was positive. Undetermined results of HpSA were excluded in this study. All stool samples examined first saline-lugol and then formalin-etil-asetat sedimentation methods for the diagnosis of giardiasis.

Statistical Analysis: Statistical analysis of the data was performed with SPSS 11.0 computer programme. The mean age of both groups were compared by student t test. Other comparisons were evaluated by Pearson's chi-square test and Odd ratios with 95% confidence intervals (95%CI). A p value <0.05 was considered significant.

RESULTS

As seen in Table 1 the age and sex distributions of the patients and the control group were found to be similar. Of the 98 children with RAP included in this study, 40 (40.8%) children were HpSA positive, 58 (59.2%) were negative. 32 (32.6) were positive for IgG antibodies, 66 (67.4%) were negative. *H. pylori* diagnosis were performed in the presence of any positive value of IgG or HpSA. Accordingly 48 (49%) children were found to be infected with *H. pylori*. When *H. pylori* seropositiveness to the age distribution were investigated, significant difference between ages was not detected (p>0.05) (Table 2).

The parasite frequency was slightly more in the children with RAP higher than that in the control group, but was not statistically significant difference (p>0.05). The association of *H.pylori* and other intestinal parasites in the children with RAP and control group were established 30.6% and 25% respectively and was not statistically significant difference (p>0.05). *Giardia intestinalis* was found in 32 (32.7%) patients, either alone or with other parasitic infections. The association *H. pylori* and g*iardiasis* was found in 22.4% of children with RAP and 6,8% of control group. The differences was statistically significant (p= 0.02) (Table 1).

Table 1. Profile of childrens with RAP and control groups

	Patient group (n: 98)	**Control group (n: 88)**	**OR**	**95%CI**	**p**
Age (mean±SD, range)	9.0±3.0 (3-15)	8.1±3.1 (3-15)			> .05
Sex (M/F)	52/46	48/40			> .05
***H.pylori* seropositivity**	48 (49)*	40 (45.5)	1,15	(0,62-2,14)	=0,6
Presence of parasites	44 (44.9)	34 (38.6)	1,29	(0,69-2,43)	=0,4
Giardia intestinalis	30 (30,6)	18 (20,4)	1,72	(0,83-3,52)	=0,1
Ascaris lumbricoides	7 (7,1)	11 (12,5)			
Entamoeba histolytica	3 (3)	2 (2,2)			
Enterobius vermicularis	6 (6,1)	9 (10.2)			
Association of *H.pylori* and parasites	30 (30.6)	22 (25)	1,32	(0,66-2,66)	> .05
Association of *H.pylori* and *G. intestinalis*	22 (22,4)	6 (6,8)	3,96	(1,42-11,57)	=0,002

*Numbers in parenthesis are percents otherwise stated.

Table 2. Association between age and *H. pylori* seropositivity in children with RAP

Age group (in yr)	Number of subject	*H.pylori* seropositivity	
	n: 98	n	%
3-8	46	20 ()	43.4
9-15	52	28 ()	53.8

OR:0,15, 95%CI:0,27-1,58, p=0,3

DISCUSSION

While organic reasons were reported to be less at RAP ethiology previously, the technological developments about gastrointestinal system increased the diagnosis facilities and organic disorders are happened to be determined at higher ratios lately. At various studies the high ratios of organic reasons were reported (14, 23, 25). Among organic reasons, *H. pylori* and *Giardia* are being reported the most often (6, 27). However, the role of *H. pylori* at RAP ethiology is still controversial. While some studies propose that it is related with RAP (7, 8, 20, 21, 22), some studies reported that it did not have a role at all (4, 9, 13). We did not determine a relation between *H. pylori* and RAP neither. For the exclusion of *H. pylori* and RAP caused by organic reasons the gastroendoscopic examinations were not done due to insufficient technical support. However, we used both the detection of *H. pylori* antibody in serum and very reliable ELISA test in order to search for *H. pylori* antigen (HpSA) in stool (18, 29), so we consider our results being reliable. In some studies, because of getting *H. pylori* at older ages, it is proposed that it is more significant at older children ethiology (19). But we did not see any difference between years. Because of the socio-echonomical circumstances and deficiencies in infrastructure, recieving *H. pylori* at early ages might have a role.

As the intestinal parasites and giardiasis were determined in the cases with RAP slightly more, statistically significant difference could not be maintained. But we determined *H. pylori*- giardiasis relationship significantly high at the events with RAP (p= 0.02). In a study in Italy, Doglioni et al. (10) , found *H pylori* infection in 37 of 41 (90.2%) patients with gastric giardiasis. Moreira et al (15). also reported the association of *H. pylori* and giardiasis in their study. In most of the cases, antral mucosa colonized with giardia was found to be coinfectant with *H. pylori* (16, 17).

Because of the high concentration of urea in their stomach, at the patients having urea who were said to have predisposition to *H. pylori* infection, giardiasis were determined to be high (5). But it is still not known whether giardiasis increases the sensitivity to *H. pylori* or vice versa. However, it is proposed that the achlorhydria and atrophic gastritis developing only after *H. pylori* infection (10). At the coinfected patients, the treatment of one agent would not improve the complaints of patients, it is recommended to treat both agents at the same time (5). As a result, we think that while investigating ethiology on the patients with RAP, this relationship is important for the patients diagnosis and consequence. Further studies to investigate this relationship are warranted.

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