Seroprevalence of helicobacter pylori in a pediatric population

İmre Altuğlu[1], A. Arzu Sayıner[1], Tijen Özacar[1], Ayten Egemen[2], Altınay Bilgiç[1]

Departments of [1]Microbiology and Clinical Microbiology, and [2]Pediatrics, Ege University Faculty of Medicine, İzmir, Turkey

SUMMARY: Altuğlu İ, Sayıner AA, Özacar T, Egemen A, Bilgiç A. Seroprevalence of Helicobacter pylori in a pediatric population. Turk J Pediatr 2001; 43: 125-127.

Helicobacter pylori (H. pylori) is one of the common bacterial infections in humans. In this study, seroprevalence of H. pylori infection in a pediatric population in İzmir and its relationship with different variables were investigated. Two hundred twenty-six children (115 boys, 111 girls, age range: 1-18) were tested for anti-H. pylori IgG. Socioeconomic conditions, living area (urban or rural), and number of people living in the same house were noted for each subject. H. pylori antibodies were determined by an enzyme immunoassay. Overall, 120 (53%) subjects were seropositive for H. pylori. The seroprevalence of H. pylori increased significantly with age and poor socioeconomic conditions. Seroprevalence did not differ according to sex, number of people living in the same house or living area.

Key words: Helicobacter pylori, seroprevalence, children, age, sex, socioeconomic conditions.

Helicobacter pylori (H. pylori) is now thought to be one of the most important factors in the etiology of chronic gastritis, peptic ulcers, noncardia gastric cancer and gastric mucosa associated lymphoid tissue lymphoma[1].

H. pylori infection is probably the most common chronic bacterial infection in humans. The prevalence of the infection varies from 50% of adults in developed countries to nearly 90% in developing countries[2].

Overcrowding and poor socioeconomic conditions during childhood appear to be risk factors for H. pylori infection. The data available is consistent with the suggestion that the infection may be acquired in early life and that person to person contact plays an important role in its transmission[3,4].

The aim of this study was to investigate the seroprevalence of H. pylori infection in different parts of İzmir and to determine the relationship of seropositivity with age, sex, number of people living in the same house, socioeconomic conditions and living area (urban or rural).

Material and Methods

The study was planned as part of the rubella seroprevalence study. In the mentioned study, a cluster sample design was carried out for the selection of the study population[5]. Among those, children aged 1-18 were selected for the presented study. The study population consisted of 226 asymptomatic children (115 boys, 111 girls, age range 1-18). The children were distributed into four groups by age: group A, 1-5 years; group B, 6-9 years; group C, 10-13 years; group D, 14-18 years.

The children were selected from different regions of Izmir and examined in two different groups, urban and rural. Socioeconomic conditions and number of people living in the same house were noted. Socioeconomic conditions were classified into three main categories (low, middle and high) according to the annual household income. Children were examined in two groups according to the people living in the number of same house (group I: 1-4 people, group II: ≥ 5 people).

Serum samples obtained from the children were stored at -20 °C until tested.

IgG antibodies to H. pylori were determined qualitatively by a commercial enzyme linked immunosorbent assay (Zeus Scientific Inc, USA).

The seroprevalence of H. pylori infection was analyzed in relation to all considered variables (age, sex, number of people living in the same house, socioeconomic conditions and living area). Chi-square test was used to examine the relation of H. pylori infection and the variables.

Results

Seropositivity for H. pylori was found in 120 of the 226 subjects (53%). Characteristics of the study population and H. pylori status are shown in Table I.

Table I. Characteristics of the Study Population

Groups		H. pylori IgG (+) Number (%)	H. pylori IgG (-) Number (%)	p value
Sex	Boys	60 (52.2)	55 (47.8)	NS
	Girls	60 (54.1)	51 (45.9)	
No of people living in the same house	1-4	64 (50.8)	62 (49.2)	NS
	≥ 5	56 (56)	44 (44)	
Socioeconomic conditions	Low	45 (65.2)	24 (34.8)	p = 0.048
	Middle	65 (48.5)	69 (51.5)	
	High	10 (43.5)	13 (56.5)	
Age	1-5	16 (33.3)	32 (66.7)	p = 0.003
	6-9	28 (50)	28 (50)	
	10-13	34 (55.7)	27 (44.3)	
	14-18	42 (68.9)	19 (31.1)	
Living area	Urban	90 (52.6)	81 (58.4)	NS
	Rural	30 (54.5)	25 (45.5)	

NS: Non-significant.

The seroprevalence of H. pylori increased significantly with age and poor socioeconomic conditions. There was only one seropositive child (1/11) among the one-year-old group. The number of children infected reached 46.8 percent (57/122) by the age of 10 years. Seroprevalance did not differ according to sex, number of people living in the same house or living area.

Discussion

In this study, the prevalence of antibodies to H. pylori and associated risk factors were determined in asymptomatic children living in different parts of Izmir.

Published studies on the epidemiology of H. pylori infection show considerable differences in the prevalence of antibodies to H. pylori in the different populations studied. In a study from India, the frequency of H. pylori infection increased with age and was > 80 percent by age 20[6]. In a study from Italy, seropositivity was 29 percent in the same age group, increased significantly with age and did not differ according to sex[7]. In France, seropositivity was 16 percent in a group aged between 10-19[9].

In a Japanese study, of 1,043 healthy adults, 416 (40%) were seropositive for H. pylori. The seropositivity rates for H. pylori significantly increased with age[8]. In another study from Japan[10] the data strongly suggested that the highest infection rates for H. pylori occur among infants and children.

Dominici et al.[11] reported that children in families where both parents were infected had a higher prevalence of H. pylori infection (44%) than children from families with only one (30%) or no parents (21%) infected. In the mentioned study, it was concluded that social status may be a risk factor for H. pylori infection.

In a study from Estonia, of the 421 schoolchildren selected from urban and rural areas, H. pylori prevalence rate was 65 percent in rural areas and 49 percent in towns[12]. In our study, no significant difference was found in the seropositivity between the groups from different living areas.

In a Turkish study in the Çukurova region, 25.9 percent of 54 asymptomatic children were found to be anti-H. pylori positive[13]. In adults anti H. pylori IgG seropositivity was determined in two different study groups in Izmir. The results were 62.5 percent in 40 asymptomatic infants and 73.8 percent in 244 adults, respectively[14,15]. Seropositivity was related to socioeconomic conditions in both studies. In another study from Turkey, 59 children with dyspeptic complaints and 48 asymptomatic children (age range 5-17) were tested for H. pylori antibodies, and 52.5 percent and 41.7 percent, respectively,

were found to be positive. The difference was not statistically significant. Seropositivity increased with age in both groups[16].

There are common patterns in most of the studies. The acquisition of H. pylori infection is early in life. The high prevalence of H. pylori infection in developing countries is a reflection of the lower socioeconomic level of those areas[6].

A number of studies indicate that crowding and number of siblings were associated with H. pylori seropositivity[7,15]. In the presented study, H. pylori seropositivity increased from 50.8 percent and 56 percent when the number of people living in the same house was ≥ 5, but the difference was statistically nonsignificant.

In this study, high seroprevalence of H. pylori and a relationship with age and socioeconomic conditions were determined. Our findings also support the fact that H. pylori is usually acquired early in life. Children in poor socioeconomic conditions are at a greater risk of infection. However, in this study, no correlation was found between seropositivity and number of people living in the same house.

REFERENCES

1. Blaser MJ. Helicobacter pylori and related organisms. In: Mandell GL, Bennett JE, Dolin R (eds). Mandell, Douglas and Bennett's Principles and Practice of Infectious Diseases. NY: Churchill Livingstone Inc, 1995: 1956-1964.
2. Megraud F. Epidemiology of Helicobacter pylori Infection. Gastroenterol Clin North Am 1993; 22: 73-88.
3. Malaty HM, Graham DY. Importance of childhood socioeconomic status on the current prevalence of Helicobacter pylori infection. Gut 1994; 35: 742-745.
4. Webb PM, Knight T, Greaves S, et al. Relation between infection with Helicobacter pylori and living conditions in childhood: evidence for person to person transmission in early life. Br Med J 1994; 308: 750-753.
5. Akşit S, Egemen A, Özacar T, et al. Rubella seroprevalence in an unvaccinated population in İzmir: recommendations for rubella vaccination in Turkey. Pediatr Infect Dis J 1999; 18: 577-580.
6. Graham DY, Adam E, Reddy GT, et al. Seroepidemiology of Helicobacter pylori infection in India. Dig Dis Sci 1991; 36: 1084-1088.
7. Luzza F, Imeneo M, Malletto M, et al. Seroepidemiology of Helicobacter pylori infection and hepatitis A in rural areas, evidence against a common mode of transmission. Gut 1997; 41: 164-168.
8. Furuta T, Kamata T, Takashima M, et al. Study of transmission routes of Helicobacter pylori in relation to seroprevalence of hepatitis A virus. J Clin Microbiol 1997; 35: 1891-1893.
9. Megraud F, Brassens-Rebbe MP, Denis F, Belbouri A, Hoa DQ. Seroepidemiology of C. pylori infection in various populations. J Clin Microbiol 1989; 27: 1870-1873.
10. Fujisawa T, Kumagai T, Akamatsu T, Kiyosawa K, Matsunaga Y. Changes in seroepidemiological pattern of Helicobacter pylori and hepatitis A virus over last 20 years in Japan. Am J Gastroenterol 1999; 94: 2094-2099.
11. Dominici P, Bellentani S, Di Biase AR, et al. Familial clustering of Helicobacter pylori infection: population based study. Br Med J 1999; 319: 537-540.
12. Vorobjova T, Grunberg H, Oona M, et al. Seropositivity to Helicobacter pylori and CagA protein in school children of different ages living in urban and rural areas in Southern Estonia. Eur J Gastroenterol Hepatol 2000; 12: 97-101.
13. Sadri R, Yiğit S, Köksal F, et al. Dispeptik çocuklarda H. pylori IgG antikorlarının insidansı. Türk Mikrobiyol Cemi Derg 1993; 23: 80-83.
14. Özgenç O, Boldemir A, Taştan A, Erdenizmenli M. Semptomatik ve asemptomatik populasyonlarda Helicobacter pylori antikorlarının araştırılması. İnfeksiyon Derg 1992; 6: 193-196.
15. Akarca SU, Aydın A, Özütemiz AÖ, et al. Ege yöresinde Helicobacter pylori infeksiyonunun seroprevalansı. Ege Tıp Dergisi 1993; 32: 31-35.
16. Gürakan F, Koçak N, Yüce A. Helicobacter pylori serology in childhood. Turkish J Pediatr 1996; 38: 329-334.