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HELICOBACTER PYLORI SEROLOGY IN CHILDHOOD*

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Serology is now generally accepted as a valid noninvasive screening method for the detection of Helicobacter pylori (Hp) infection. We determined the frequency of serum Hp IgG antibodies in 59 children with dyspeptic complaints and 48 age-matched controls by ELISA. Positive Hp antibodies were found in 52.5 percent of patients and 41.7 percent of controls. The difference was not statistically significant. The percentage of positivity increased with age for both patients (50% in 5-9, 51.7% in 10-14 and 72.7% in 15-17 year age-groups) and controls (36.8% in 5-9, 50% in 10-14, 68.4% in 15-17 year age-groups). These results suggest that Hp infection has a relatively high prevalance among children in our region, and increase with age. A large proportion of asymptomatic children also demonstrate signs of past or present exposure. *Key words: Helicobacter pylori, children, serology.*

Nowadays there is little doubt about the relationship between Helicobacter pylori and the presence of active chronic gastritis, duodenitis and peptic ulcer in both adults[1,2] and children[3,4]. Very recently it has been suggested that this microorganism might play a role as a cofactor in the evolution of gastric cancer[5,6]. Asymptomatic carriers of Hp have been demonstrated[7]. The prevalence of Hp infection has been reported to increase with age[8]. The main reservoir of Hp seems to be the human stomach[9], and the main infection route person-to-person transmission[10].

As for any bacterial infection, culture is the preferred method of diagnosis of Hp infection[11]. An upper digestive tract endoscopy must be performed to collect a sample for culture, histological examination or rapid urease test, those being the other diagnostic methods for Hp. However, this invasive technique is difficult to use in children, have and cannot be proposed as a screening method. Recent articles have reported the reliability of serologic tests for the detection of Hp infection[12,13].

We determined Hp anibodies by means of an enzyme-linked immunosorbent assay (ELISA) to assess the prevalence of Hp serum antibodies in dyspeptic and asymptomatic children.

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Material and Methods

Over a six-month period (November 1993 - May 1994) we prospectively studied 59 patients referred to the Pediatric Gastroenterology Unit for evaluation of dyspepsia. None of these patients had received nonsteroidal antiinflammatory agents, antibiotics, H2 receptor antagonists or bismuth salts for one month prior to serologic examination. The patient group consisted of 31 boys and 28 girls, mean age 11.1 ± 3.4 years (range 5-17), who had had epigastric or periumbilical pain and/or nausea, vomiting and regurgitation for at least one month. They were subjected to a standard protocol consisting of routine laboratory investigations of blood and stool as well as radiological examination of the upper gastrointestinal system.

The control group consisted of 48 children, 24 boys and 24 girls, with a mean age of 10.73 ± 3.63 years (range 5 - 17 years), who were seen in the outpatient clinics for nongastrointestinal complaints. None of them had abdominal pain or vomiting. All patients and controls were grouped according to age.

Two ml of whole blood was obtained, and the serum was frozen at –20°C. Sera were coded and examined blindly by Hp-specific ELISA (Pyloriset EIA -G- Orion Diagnostica, Finland), which allows detection of IgG antibodies to Hp in human sera. The cut-off value (positive result) was defined as an IgG level greater then two standard deviations above the mean of all negative titers (in optical density units at 450 nanomicrons).

Statistical significance was determined utilizing chi square analysis and two-tailed Student's t test.

Results

Serology for Hp was positive in 31 of 59 patients (52.5%) and 20 of 48 controls (41.7%). The difference between the prevalence of Hp antibodies among the dyspeptic group compared to the control group was not statistically significant ($p>0.05$). Among the dyspeptic group, 15 were diagnosed with dudodenal ulcer. Seven of 15 peptic ulcer (46.7%) and 24 of 44 (52.5%) other dyspeptic patients were positive for anti-Hp IgG antibodies. There was no difference in the prevalence of Hp antibody between the two patient groups ($p>0.05$). The percentage of positivity increased with age for both patient and control groups (Fig. 1). In the patient group, Hp antibody positivity increased from 50 percent (8 of 19) in 5-9-year-old children to 51.7% (15 of 29) in the 10-14-year-old group, and to 72.7 percent (8 of 11) in the 15-17 years group. While Hp antibody positivity was 36.8 percent (6 of 20) for 5-9-years control group, it increased to 50 percent (9 of 19) in the 10-14-year-old and to 68.4% percent (5 of 9) in 15-17-year-old children. Although the positivity was higher for every age-group among dyspeptic patients

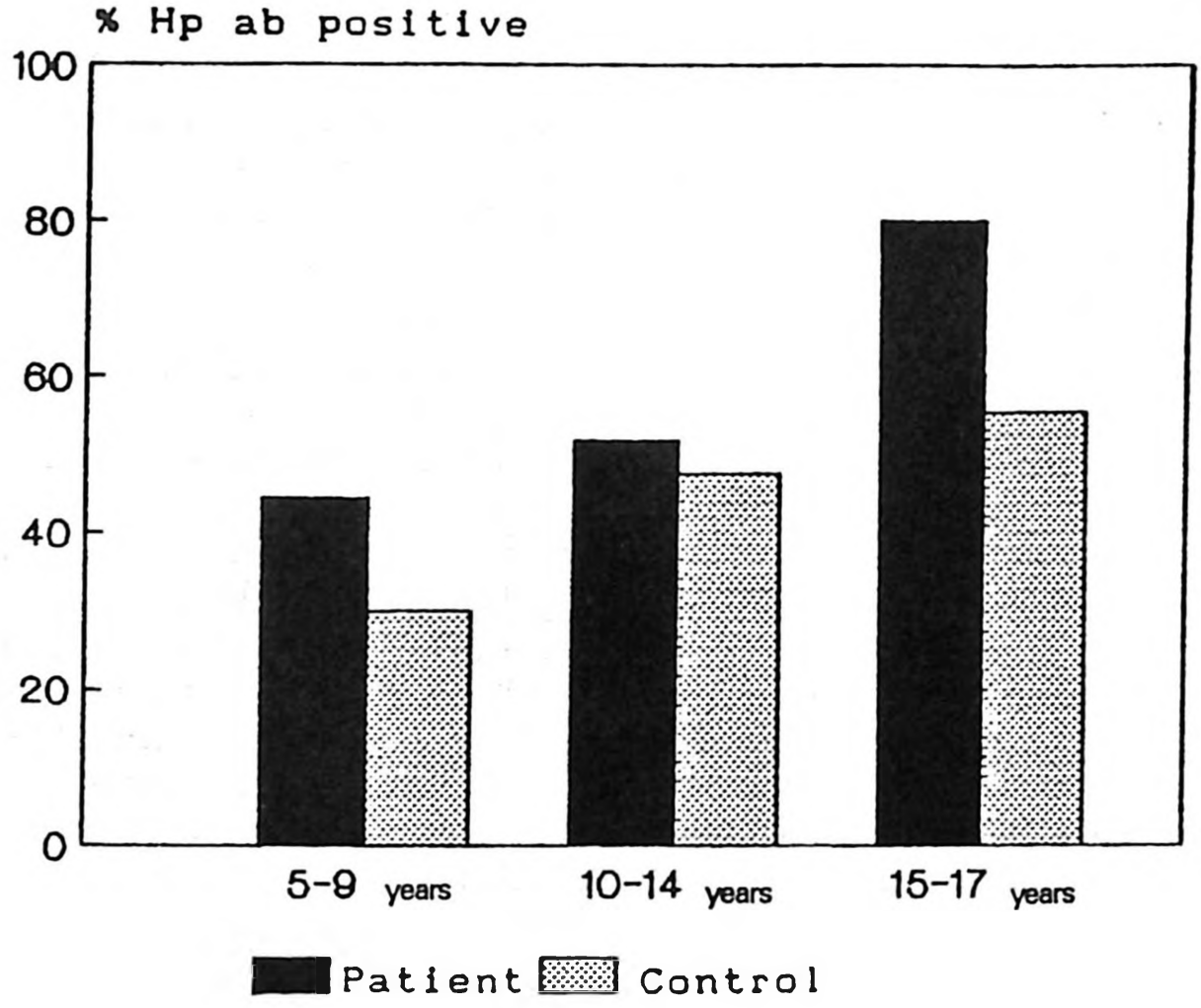

Fig. 1: Hp antibody positivity according to age-groups.

compared to the control group, these differences were not statistically significant at any age ($p > 0.05$ for all).

In the patient group, the mean age of Hp antibody-positive children was greater than that of negative ones (mean age 11.96 m 3.15 years for Hp positive, 10.19 m 3.39 years for Hp negative, $p<0.05$). This difference was not statistically significant in the control group (mean age 11.42 m 3.48 years for Hp positive, 10.25 m 3.73 years for Hp negative, $p>0.05$). The difference between the mean ages of Hp antibody-positive children in the two groups was not statistically significant ($p>0.05$).

The difference betwen the prevalence of Hp antibodies among boys (40%) and girls (55.7%) was not significant overall, nor was there a significant difference within the patient (boys 45.2%, girls 60.7%) and control (boys 30%, girls 50%) groups ($p>0.05$).

Discussion

Infection with Hp increases an individual's risk of peptic ulcer and gastric cancer. Difference have been noted in the prevalence of Hp infection in various countries. In the developed world, prevalence increases with age and varies with social class[14]. In underdeveloped parts of the world. Hp infection appears to occur a decade of more earlier, with high rates even in young children[15]. In such countries, most people acquire the infection by late childhood[16].

Epidemiological studies using serological tests have shown that a large proportion of healthy people have antibodies to Hp. Musgrave et al.[17] reported that eight of 39 patients without gastritis and Hp colonization, had high anti Hp titers. Laffeld et al.[18] found that six of 22 patients without Hp had Hp antibodies in the range found in actively infected patients. Meyer et al.[19] showed that 49 percent of healthy blood donors had anti Hp, but only 24 percent had active infection. It is uncertain whether the presence of anti Hp indicate active infection or only past exposure to the microorganism. These studies suggest that a considerable number of healthy people previously infected with Hp have spontaneously eliminated the microorganism. That means that Hp colonization is a dynamic process with an active phase of infection and subsequent elimination in at least a proportion of infected people. Avşar et al.[20] found positive serology in 85.8 percent of asymptomatic adults in our country.

The prevalance of Hp in children with different gastrointestinal disorders is reported to range from six to 30 percent[21]. As in adults suffering from nonulcer dyspepsia, Hp can be responsible for the abdominal complaints in some children with recurrent abdominal pain (RAP). Meer et al.[22] however have shown no significant difference between the Hp antibodies in children with RAP and the control group. Our study also showed no difference in the Hp seropositivity rate between symptomatic and asymptomatic children. Blecker et al.[23] found seven percent seropositivity in asymptomatic children of all ages. While our antibody rate was 41.7 percent, another study from Turkey revealed 25 percent[24] seropositivity in a childhood control group. The higher rate from developed countries is an expected finding.

In both the patient and control groups, the Hp antibody rate increased with increasing age, in accordance with other studies[8,25]. Similarly no sex difference was found in this study.

Serologic tests are easy to perform, relatively inexpensive, devoid of radioactivity, and very acceptable to patients, including children. However, a solely serological diagnosis might negatively affect the actual prevalence of Hp. As there was no difference in antibody rate between dyspeptic and nondyspeptic children in our study, the diagnostic role of Hp antibodies in the gastrointestinal diseases of

pediatric patients should not be overestimated. Titers of antibody to Hp are known to fall with eradication of bacteria[26]. Therefore, serological testing might be a suitable method for monitoring treatment and probably for diagnosing recurrent but not primary infection.

Although some authors have proposed serological screening of dyspeptic patients for cancellation of endoscopy if negative[27], our findings do not support this recommendation. Eight of our fifteen duodenal ulcer patients (53.3%) were seronegative for Hp. Other diagnostic methods, such as endoscopic biopsy, urease test and culture, are necessary for accurate diagnosis of Hp infection.

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