RESEARCH BRIEF

Growth Parameters in Children with Dyspepsia Symptoms and *Helicobacter pylori* Infection

SEYED MOHSEN DEHGHANI, *HAMDOLLAH KARAMIFAR, TAYEBBEH RAEESI AND MAHMOOD HAGHIGHAT

*From the Departments of Pediatric Gastroenterology, and Gastroenterohepatology Research Center; and *Department of Endocrinology, Shiraz University of Medical Sciences, Shiraz, Iran.*

Correspondence to:
Dr Seyed Mohsen Dehghani,
Assoc. Professor Pediatric Gastroenterology, Gastroenterohepatology Research Center, Shiraz University of Medical Sciences, Shiraz, 71937-11351, Iran. dehghanism@sums.ac.ir
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Controversy exists about relationship of *H. pylori* infection and somatic growth retardation of children. The aim of this study was to evaluate the relationship between *H. pylori* infection and growth parameters in children. 113 children with dyspepsia (4-18 years) were enrolled. C_{13} urea breath test was performed for determination of *H.pylori* infection. Height, weight, body mass index (BMI) and standard deviation score (SDS) was calculated and growth parameters were compared between two groups of *H.pylori* positive and those with negative results. The prevalence of *H.pylori* infection was 52.2%. There was no meaningful relation between calculated SDS (for height and BMI) and *H.pylori* infection.

Key words: *Children, Helicobacter pylori, Growth*.

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It has been estimated that at least half of the world population is infected by *H.pylori* [1]. Although, this infection occurs in childhood, but still its consequences are not identified thoroughly [2]. Some studies are claiming that *H.pylori* infection has an adverse effect on children's height [3-5]. The present paper investigates the relationships, if any, between growth parameters and symptomatic *H.pylori* infection in children.

METHODS

We evaluated 113 children (age 4-18 y) with symptoms of dyspepsia. Diagnostic criteria for dyspepsia were: persistent or recurrent pain or discomfort centered in the upper abdomen, not relieved by defecation or associated with the onset of a change in stool frequency or stool form, and no evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains the subject's symptoms (for at least once per week for at least 2 months). All children were subjected to urea breath test (UBT) with BreathTek UBT kits that contained two breath collection bags and granulated Pranactin-Citric consisting of 75 mg of C13-urea and 2 g of citric acid. The materials were dissolved in 100 mL of water. Patients were required to fast for at least 6 hour prior to administration of the UBT. Each patient provided two breath samples: a baseline breath sample and a post-dose breath sample 15 minutes after ingestion of the C13-urea. Breath samples were analyzed using UBiT-IR300 spectrophotometers. The results of UBT were scored based on enrichment of C13 in the breath as delta over baseline (DOB). *H.pylori*-positive and *H.pylori*-negative results were determined using the cut-off DOB greater than 2.4%. After measuring weight and height of children, body mass index (BMI) was calculated. Standard deviation score (SDS) of height, weight, BMI, and growth parameters were used for the comparison of *H.pylori* infected subjects with those who were not infected by *H.pylori*. We used WHO Child Growth Standards for calculation of SDS of height, weight, and BMI.

RESULTS

There were 113 children (58% girls) with mean age of 9.8±4.1 years (range 4-18 years). Among these, 59 (52%) patients including 33 girls and 26 boys were UBT positive for *H.pylori*; found differences were not significant comparing prevalence of *H.pylori* in boys and girls (P=0.577). Mean age for UBT positive children was 11.1± 4.1 years, and for the UBT negative was 8.5±3.4 years (P <0.001).

***Table* I** compares the gastrointestinal symptoms between *H. pylori* infected and non-infected children. Only anorexia had a significant relation with *H.pylori* infection (P=0.041). ***Table* II** compares the distribution of SDS for height and BMI for all subjects.

DISCUSSION

This study revealed that 52% of dyspeptic children were

WHAT THIS STUDY ADDS?

- Symptomatic *H. pylori* infection does not appear to influence the linear growth in children.

TABLE I SYMPTOM IN UBT [+] AND UBT [-] GROUPS

Symptoms	*UBT(-)*	*UBT (+)*	*P value*
Abdominal pain	54 (100%)	59 (100%)	—-
Anorexia	35 (64.8%)	48 (81.4%)	0.041
Early satiety	35 (64.8%)	37 (62.7%)	0.816
Nausea	27 (50%)	30 (50.8%)	0.928
Heartburn	12 (22.2%)	18 (30.5%)	0.319
Eructation	10 (18.5%)	12 (20.3%)	0.807
Vomiting	6 (11.1%)	14 (23.7%)	0.079

UBT: Urea Breath Test.

TABLE II COMPARISON OF DISTRIBUTION OF SDS OF HEIGHT AND BMI FOR UBT [+] AND UBT [-] CHILDREN

Variables	*UBT(-)*	*UBT (+)*	*P value*
SDS of Height			
Total	- 0.82 1.6	- 0.78 1.4	0.899
Girls	- 0.88 1.4	- 0.77 1.5	0.763
Boys	- 0.72 1.9	0.80 1.3	0.873
SDS of BMI			
Total	- 0.92 1.7	0.88 1.5	0.213
Girls	- 0.93 1.7	- 0.87 1.4	0.112
Boys	- 0.88 1.9	- 0.89 1.5	0.620

SDS: Standard Deviation Score; BMI: Body Mass Index; UBT: Urea Breath Test.

infected with *H. pylori*, but did not show any significant correlation between symptomatic *H. pylori* infections and SDS for height and BMI.

Prevalence rates of *H. pylori* infection in children ranged between 1-80%. Prevalence rates are higher in developing countries [6]. The rate of *H.pylori* infection as found in our study was higher than that in Sood, *et al*. [7] findings, in which the infection was prevalent in 38% of dyspeptic children in the United States. Contrary to our results, they observed that *H. pylori* infected children have significantly shorter height and lower weight in comparison to *H. pylori* negative children. However, in terms of socioeconomic and ethnic factors, these differences were not significant as their study did not make any appropriate adjustments of socioeconomic factors. Our results are similar to that of another study [8], which found no correlation between *H. pylori* infection and growth failure, and between its treatment and growth velocity. Another Egyptian study reported high prevalence of *H. pylori* among school children and demonstrated that the infection caused growth retardation in them [5]. However, a similar study done by Soylu, *et al*. [9] did not support this effect of the disease.

We found no significant evidence of the effects of *H. pylori* on growth, but socioeconomic parameters, if not appropriately adjusted, can limit the findings of growth related studies, including this study. However, SDS values were calculated and the age-group of the patients were excluded to improve the findings of this study. As our data presents, the mean SDS, for height and BMI, falls below zero; that means in average, height and BMI of subjects are below the 50th centile. It seems that all under study children with gastrointestinal symptoms, either those who had *H. pylori* infection or the others who were not infected, had a decreased growth in comparison with average of society. These results indicate the influence of other factors such as malnutrition on growth failure.

Based on data collected in this study, we have found no significant correlation between *H. pylori* infection and growth parameters. Symptomatic *H. pylori* infection does not appear to influence the linear growth in children.

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