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Research Article

THE ASSOCIATION BETWEEN H. PYLORI AND GASTROESOPHAGEAL REFLUX IN OBESE CHILDREN

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ABSTRACT

The purpose of our study is to research whether the relationship between H.Pylori and gastroesophageal reflux (GER) in the obese pediatric population is different from that of the normal population, and to evaluate the frequency of the association of GER and H.Pylori. The study includes 40 patients with similar socioeconomic backgrounds and nutritional habits, and who have increased (≥ 25kg/m2) and normal (< 25 kg/m2) body-mass index. GER scintigraphy was performed to each patient on different days under proper conditions and the presence of H.Pylori was investigated through the C14 Urea Breath Test. The obtained data was analysed in the SPSS 15.0 programme. There is positive correlation between presence of obesity and the age (r:0,321 p:0,044). H.Pylori positivity is 55%. Although the positive rate of GER is 35% in the obese group and 25% in the control group, it is statistically shown that the presence of obesity among children with reflux does not constitute an important risk factor (OR:1,5 P:0,5). In the obese pediatric group, the presence of reflux in the presence of H.Pylori is 3.33 times more (OR: 3.337 p = 0.149). In both of the groups, there is no correlation between C14 positivity and the presence of GER (r:-0,175 p:0,279). According to the obtained data, there is no significant difference between the obese children and normal children in terms of the incidence of GER and H.Pylori. Also, no correlation between H.Pylori positivity and GER in the obese group could be observed.

Key Words: *Gastroesophageal Reflux, H. Pylori, Obese Children*

INTRODUCTION

The frequency of pediatric obesity is increasing dramatically (Patel *et al.*, 2010). In many studies, the ratio of obesity was reported as 10% in preschool children (Wang, 2011; El-Serag, 2005), 19.6% in school children (Moon, 2009; Boz, 2009) and 18.1% in adults (Wells, 2012; Locke, 1999).

It is known that obesity in childhood leads to major health problems such as joint and skeletal problems, hyperlipemia, abnormal glucose tolerance, hypoventilation and metabolic syndrome (Daniels, 2005; Chan, 2009).

Obesity is considered as an independent risk factor for gastroesophageal reflux (GER) in adults (El-Serag, 2005). On the other hand, the relation between obesity and GER in childhood could not be explained (Malaty, 2009). Furthermore, a limited amount of literature is seen about the association of GER and Helicobacter Pylori in children; and it could not be clarified whether there is a positive or a negative relationship between GER and Helicobacter Pylori (Moon, 2009). During our literature review, we had not encountered any publication on the issue focusing on obese children.

The aim of this study is to research the frequency and the association of H.Pylori infection and GER in obese pediatric cases.

MATERIALS AND METHODS

Patients

Fourty patients included to study. Twenty of them with mean age of 12.05 years were obese. Body mass indexes of obese patients (BMI) were higher 25 kg/m^2 and above 95% according to the age. They had

similar socioeconomic backgrounds and nutritional habits; and admitted to pediatric clinic of Mustafa Kemal University Medical Faculty Hospital with regurgitation, epigastric pain, nausea, heartburn and vomiting complaints. The rest of the patients constituted the control group and they had normal weight (BMI<25 kg/m2) (Barlow, 2007; Kyriazanos, 2002). The mean age of control patients was 9.9 years. Mustafa Kemal University Ethics Committee approved the study. Patients who had history of chronic disease and abdominal surgery, and patients who received treatment for GER and H.Pylori were not included the study.

Gastroesophageal reflux scintigraphy and C14 urea breath test were performed to all patients in different days.

Gastroesophageal Reflux Scintigraphy

After fasting for at least 4 hours, the patients were given orally 37–74 megabecquerel (MBq) 99mTc-diethylene triamine pentaacetic acid (Tc-99m DTPA) (Mon.DTPA, Eczacıbaşı/Monrol) in a mixture of orange juice (15 ml/kg) (Asakura, 2005; Boz, 2009). After the administration of radiolabeled fluid, patients were given normal orange juice to clear esophagus contamination.

Scintigraphic examination was performed by dual-head gamma camera (Symbia S, Siemens Healthcare) device and low-energy high-resolution parallel-hole collimator was used. Patients lied in supin position under the gamma camera and stayed for 30 minutes with the help of their parents.

All images were evaluated for detection of reflux. Minimum one reflux episode in the esophagus was diagnosed as GER.

C 14 Urea Breath Test

Before the test, antibiotics were stopped for one month and patients were fasted at least 4 hours. Patients were given 37 kBq (1 μ Ci) C-14 in capsule form (Helicap TM, Kibion, Uppsala, Sweden). A dry cartridge system was used for collecting the breath samples (Heliprobe BreathCard TM, Kibion, Uppsala, Sweden). Patients were stopped the exhalating to cartridge when the colour of indicator membrane changed from orange to yellow. The breathcard was placed into a special Geiger-Müller counter (Heliprobe TM -analyser, Kibion, Stockholm, Sweden) which is counting the activity for 250 seconds. Results were given both as counts per minute (CPM) and as grade (O: infection negative, CPM < 25; 1: suspicious, CPM: 25–50; 2: infection positive, CPM > 50).

Statistical Analysis

Student's t-test and chi-squared test on SPSS 15.0 programme were used to analyse the data. Since the data did not have a normal distribution, it was compared with the Mann-Whitney U-test. The spearman correlation analysis was applied to present the relationship between the variables. Additionally logistic regression analysis was applied to identify the risk factors that were affecting development possibility of C14 (+) and reflux. The results with $p < 0.05$ were considered as significant.

RESULTS AND DISCUSSION

Results

The mean age was 12.05+2.6 years in obese children and 9.9+3.1 years in normal weighted children. The age difference of two groups was statistically significant (p: 0.04) and positive correlation was seen between the presence of obesity and age (r: 0,321 p: 0.044).

The mean age of children with and without reflux was 10.6+3.2 and 11.1+3.0 years. Difference between the two groups was not significant (p>0.05). Although the presence of reflux in boys was more frequent than girls; this was not statistically significant (OR: 2.962, p =0.190).

Although GER positivity in the obese group was 35%, it was 25% in the control group (As shown in Figure 1). Statistically presence of obesity was not an important risk factor for children with reflux (OR: 1.5 P: 0.5).

The mean age was 12.09±2.9 years in children with C14 (+) and 9.6±2.7 years in children with C14 (-). This was statistically significant (p: 0.007). Positive association was seen between positive C14 test and age (r: 0.434 p: 0.004).

While H.Pylori positivity in the obese pediatric group was 55%, it was also 55% in the control group. Although in the presence of reflux the presence of H.Pylori was 3.33 times more in the obese pediatric group, this was statistically not significant (OR: 3.337 p = 0.149). No correlation was seen between C14 positivity and GER in the obese and control groups (r:-0,175 p: 0,279).

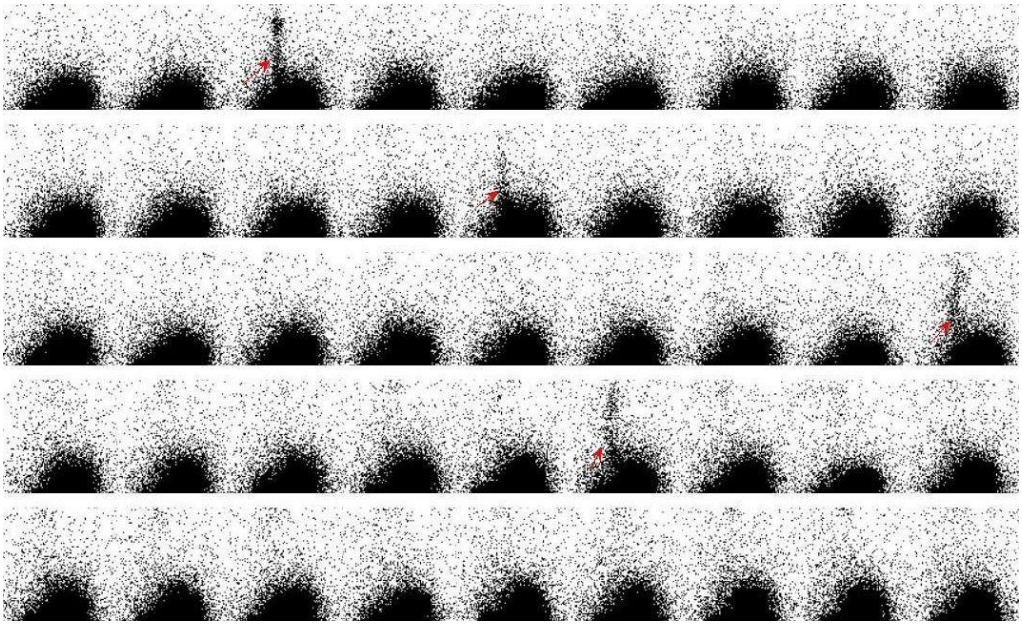

Figure 1: GER scintigraphy in obese patient

Discussion

Obesity can be defined as the excessive increase in body weight and fat cells (Wells 2012). In the last decades, pediatric obesity has become a global problem. Studies show that obesity increases by age. Likewise, in our study we found that obesity increases by age and there is a positive correlation between them (Wang, 2011; Al-Junaibi, 2013).

Cross-sectional studies and meta-analysis show that there is a connection between obesity and GER (Cook, 2008; Corley, 2006). However, there are a few studies on children about this. Although Pashankar *et al.*, (2009) and Stordal *et al.*, (2006) found a connection between increased BMI and GER, Patel *et al.*, (2010) and Elitsur *et al.*, (2009) claimed that prevalence of GER in normal weighted and obese childrens is not different. According to our data, GER is more frequent in obese children; but this was statistically not significant. According to our results which are consistent with the literature, no connection was identified between GER and age, and sex ($p>0.05$) (Pashankar, 2009).

Currently, the connection between GER and H.Pylori is still a discussion topic, and there is a limited amount of literature on the issue focusing on children.

In the diagnosis of H.Pylori, noninvasive tests have taken the place of biopsy-based tests (Hackelsberger, 1998; Rasool, 2007). Guidelines are recommending that noninvasive tests should be performed on dyspeptic patients under 45 years old, and appropriate treatments should be administered if infection is diagnosed (European Helicobacter Pylori Study Group 1997, The report of the Digestive Health Initiative SM International Update Conference on Helicobacter pylori, 1997). Among noninvasive tests, the sensitivity and specificity of urea breath test are found as 92-93% and 88-93%, and validity of the test is found as 90-93% (Rasool, 2007; European Helicobacter Pylori Study Group, 1997). Furthermore, compared to serologic tests, urea breath test is more sensitive in differentiating previous infection from active infection (Bruden, 2011; Seyda, 2007). Therefore, we have performed C-14 urea breath test in order to show the presence of H.Pylori.

It is stated that the rate of H.Pylori infection in developed countries is 20% whereas in developing countries the infection rate is 60-80% (Kyriazanos, 2002; Wu, 2005). In our study, H.Pylori positivity was found as 50%. Additionally, in compliance with the literature, we have observed that H.Pylori positivity is significantly increasing by age ($p<0.05$) (Ford, 2010).

Arslan *et al.,* (2009) have reported that H.Pylori positivity is increasing in the obese population. However, relying on their study on young adults, Kyriazanos *et al.,* (2002) have reported that there is no connection between H.Pylori and obesity. Our results showed that H.Pylori positivity was not different in obese and normal weighted childrens.

Relying on our literature review, we have conducted the first study on the association of GER and H.Pylori in obese children. Although our results showed that in the presence of reflux the presence of H.Pylori was 3.33 times more, this was statistically not significant. Also, association was not observed between C14 positivity and GER in the obese and control groups.

Major downside of our study is the limited number of patients. We have excluded morbid obese and overweight children from the scope of our study; it may be a reason for this situation.

Conclusion

In conclusion, gastroesophageal reflux scintigraphy in the diagnosis of GER and C14 urea breath test in the diagnosis of H.Pylori infection are easily performed on children and they are noninvasive tests. Although we have found that the presence of reflux is not increasing in obese pediatric population compared to the normal population, and we have not found a correlation between gastroesophageal reflux and H.Pylori positivity in the same populations. There is still a need for large-scale studies.

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