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Original Article

Gastroesophageal reflux frequency of children in Hatay: A retrospective analysis

Füsun Aydoğan[a,*], Ebuzer Kalender[a], Erhan Yengil[b], Recep Dokuyucu[c,] Murat Tutanc[d]

[a]*Department of Nuclear Medicine, Mustafa Kemal University Faculty of Medicine, Hatay/Turkey*
[b]*Department of Family Medicine, Mustafa Kemal University Faculty of Medicine, Hatay/Turkey*
[c]*Department of Physiology, Mustafa Kemal University Faculty of Medicine, Hatay/Turkey*
[d]*Department of Paediatrics, Mustafa Kemal University Faculty of Medicine, Hatay/Turkey*

Abstract. Gastroesophageal reflux disease (GERD) refers to clinical symptoms caused by pathological escape of stomach contents to esophagus. Several diagnostic methods are used for the detection of GERD in children. In our study, gastroesophageal reflux scintigraphy cases performed in our clinic between April 2012 and September 2010, were retrospectively analyzed visually and quantitatively. It was aimed to evaluate the frequency of GERD according to age groups in the pediatric population of Hatay.

A total of 122 patients aged between 2 months and 15 years with suspicion of GERD were included to our study retrospectively. Patients were divided into 4 groups according to their ages, and each group was divided into 2 groups as GERD positive and negative ones. Scintigraphic imaging was performed using Tc-99m DTPA. Images were evaluated visually and quantitatively.

There were pathologic reflux in 36 of 122 patients (29.5%) according to gastroesophageal reflux scintigraphy. GERD was found higher in boys than in girls statistically (p= 0.008) and positivity rate in 0-2 age group was significantly higher than in other age groups (p=0.001). The index values were higher in 0-2 age group cases who had negative gastroesophagial reflux index and this was statistically significant (P=0.007) than other age groups.

As a result, gastroesophagial reflux scintigraphy is a well-tolerated imaging modality that allows the diagnosis of the disease noninvasively in children by avoiding the invasive diagnostic tests.

Key words: Gastroesophagial reflux, scintigraphy, children

1. Introduction

Gastroesophageal reflux disease (GERD) refers to clinical symptoms caused by pathological escape of stomach contents to esophagus and the histological changes in the esophagus and it affects the 3.3%-8% of the pediatric population (1, 2).

Gastroesophageal reflux is a physiological and self-crossed condition that is commonly seen in infants (3). However, as a result of the increase in frequency and duration of reflux, many pathological conditions like as recurrent pneumonia, chronic cough, apnea, laryngitis, asthma, wheezing, esophagitis, Barrett's esophagus, growth retardation, can be seen (4). On the other hand, many diseases with chronic regurgitation may imitate the GERD. These diseases include hydronephrosis, brain tumors and other reasons caused to increased intracranial pressure, metabolic diseases such as intestinal obstruction and uremia (5).

In older children GERD can be diagnosed similarly to adults with symptoms such as pyrosis, regurgitation, continuously bitter taste in the mouth, but the evaluation of the symptoms in children who don't speak can be very difficult.

GERD in children, especially in infants, differs from adults because of the clinical symptoms, easily applicable and reliable alternative diagnostic methods and the lifelong following potential of disease (6,7). Several diagnostic methods are used for the detection of GERD in children. These methods include gastroesophageal reflux scintigraphy, upper gastrointestinal passage graphy, ultrasound,

[*]Correspondence: Yrd. Doç. Dr. Füsun Aydoğan
Mustafa Kemal University Faculty of Medicine, Department of Nuclear Medicine, Hatay/Turkey
Phone: 0 505 6579710
E-mail: drfusunay@yahoo.com
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esophagogastroduodenoscopy and biopsy, esophageal pH monitoring and manometry.

In our study, gastroesophageal reflux scintigraphy cases performed in our clinic between April 2012 and September 2010, were retrospectively analyzed visually and quantitatively.We aimed to evaluate the frequency of GERD according to age groups in the pediatric population of Hatay and also it was aimed to discuss the results with current literature data.

2. Material and methods

A total of 122 patients aged between 2 months and 15 years with suspicion of GERD were included to our study retrospectively. Sixty-two of patients (50.8%) were male and 60 of (49.2%) them were female. Patients were divided into 4 groups according to their ages: There were 22 patients (18%) aged 0-2 years, 13 patients (10.7%) aged 2-5 years, 40 patients (32.8%) aged 5-10 years and 47 patients (38.5%) aged 10-15 years. Each group was divided into 2 groups as GERD positive and negative ones.

As a radiopharmaceutical, the 35-37 MBq Tc-99m DTPA was given to patients perorally in fruit juice or infant formula. Scintigraphic examination was performed by dual-head gamma camera (Symbia S, Siemens Healthcare) with low-energy general purpose collimator. Dynamic images were obtained from patients in the anterior position while stomach and esophagus enter into the image area. Images were evaluated visually and quantitatively. In quantitative evaluation, interest areas were drawn to stomach, esophagus and background (Figure 1). Gastroesophageal reflux index was calculated quantitatively using the following formula.

RI= (ET-EB) / G0 X 100

RI: Reflux Index

ET: esophageal count at time

EB: esophageal background counts

G0: Gastric counts beginning of study

Gastroesophageal reflux was considered as positive in patients who had radioactivity escaping to esophagus more than one image and gastroesophageal reflux index higher than 4%.

3. Results

There were pathologic reflux in 36 of 122 patients (29.5%) according to gastroesophageal reflux scintigraphy. In boys, GERD was positive in 25 cases (40.3%) and negative in 37 cases (59.7%). In girls, GERD was positive in 11 cases (18.3%) and negative in 49 cases (81.7%). GERD was found higher in boys than in girls statistically (p= 0.008) and positivity rate in 0-2 age group was significantly higher than in otherage groups (p=0.001). GERD distribution according to age groups is given in table 1.

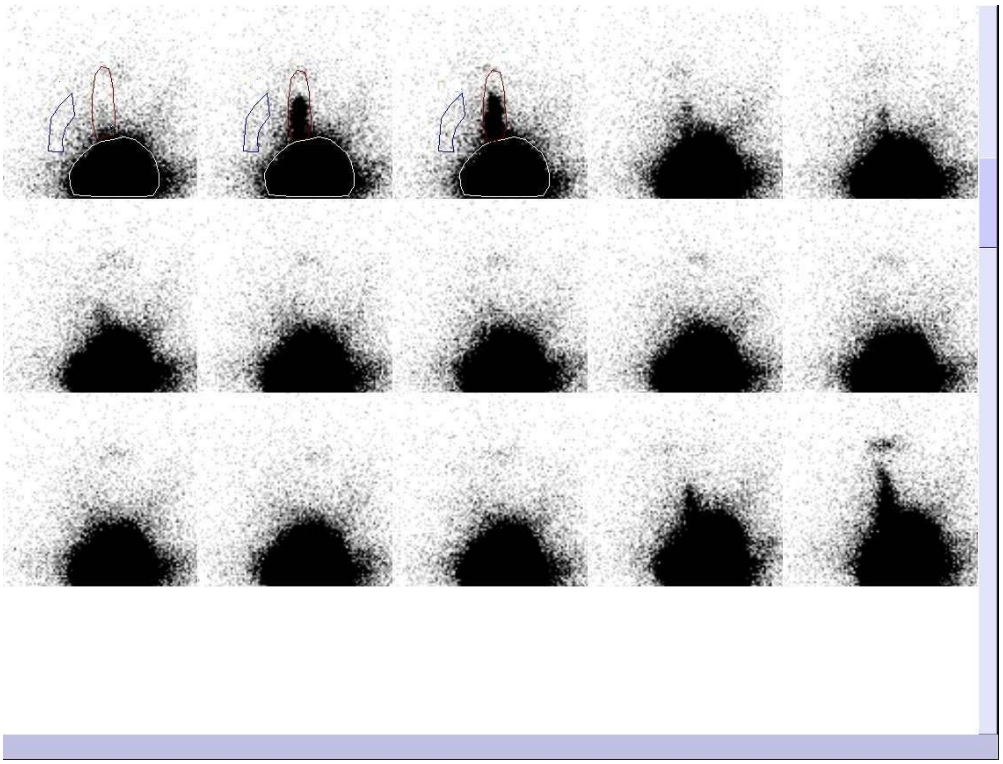

Fig. 1. Interest areas were drawn to point out the stomach, esophagus and background.

Table 1. The distribution of GERD according to age groups

Age (year)	GERD positive (%)	GERD negative (%)
0-2	13 (59.1%)	9 (40.9%)
2-5	4 (30.8%)	9 (69.2%)
5-10	13 (32.5%)	27 (67.5%)
10-15	6 (12.8%)	41 (87.2%)

According to the quantitative calculations obtained from the reflux positive and negative scintigraphic images, there were no significant difference between index values according to age groups in patients who had positive gastroesophagial reflux index (more than 4%). The index values were statistically higher than other age groups in 0-2 age group cases who had negative gastroesophagial reflux index (P=0.007) (Table 2).

Table 2. Gastroesophageal reflux indexes of patients with negative reflux, according to age groups

Age groups (year)	Gastroesophageal reflux index (±sd %)
0-2	2,5±0.7
2-5	1.6 ± 0.7
5-10	1.5±1
10-15	1.3± 0.7

4. Discussion

GERD can be defined as pathological escape of stomach contents to esophagus. On the other hand, gastroesophageal reflux is a physiological and self-crossed condition that is commonly seen in infants (3). In our study, the gastroesophageal reflux indexes of children in 0-2 age group who had negative gastroesophagial reflux scintigraphically, were higher than other age groups cases. We thought that this result may be due to physiological regurgitation.

Many pathological conditions like as recurrent pneumonia, chronic cough, apnea, laryngitis, asthma, wheezing, esophagitis, Barrett's esophagus, growth retardation, can be seen as a result of the increase in frequency and duration of reflux (8).

In the literature, the incidence of GERD in children was reported between 3.3% and 8% (1, 2). The rate of reflux was reported as 37% in pediatric patient group suspected with gastroesophageal reflux by Argon et al (9). We have found the frequency of pathological reflux as 29.5% according to the scintigraphy results. According to our results, the frequency of reflux in the 0-2 age group was higher than other age groups in accordance with other studies (10). Martigne et al have reported the GERD frequency of French children as 12.6% in 0-2 age group and 7.6% in the 12-17 age group (11). In our study the frequency of GERD is similar to literature as 13% for 0-2 age group and 6% for 10-15 age group.

Gastroesophageal reflux scintigraphy is a widely used method in the diagnosis of reflux without affecting the gastrointestinal physiology (4). Scintigraphic method was firstly used for adults, but later it was began to be used in the evaluation of children and infants (9). The amount of radiation exposure in scintigraphic examination is minimal and there is no need for hospitalization (12-14).

The sensitivity of gastroesophageal reflux scintigraphy was reported between 56% and 100% in several studies. The main factors affecting sensitivity are amount of isotope used in, sensitivity of gamma camera and duration of reflux (9). Combination of scintigraphic examination with 24-hour oesophageal pH monitoring and manometry studies are recommended to achieve the highest sensitivity for the diagnosis of GERD (15).

In conclusion, gastroesophagial reflux scintigraphy is a well-tolerated imaging modality that allows the diagnosis of the disease noninvasively in children by avoiding the invasive diagnostic tests.

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