Original Article

Endoscopy in adolescents and its clinical correlation

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Abstract

Background: The relation of digestive symptoms and pathologies seen at endoscopy in adolescents is not well established and controversial. **Purpose:** This study had the objective of investigate the relation of digestive signs and symptoms and the presence of endoscopic findings. **Methods:** A prospective study was conducted between April 2005 and September 2005. 162 adolescents were studied, 120 female and 42 male ordered to endoscopy. To determine the symptoms one used a questionaire with digestive symptoms. To make a diagnose, the adolescents were submitted to endoscopy and biopsied according to the Sydney System modified by Dixon. To detect Helicobacter pylori was used two methods, urease test and histopathological exam. **Results:** There was a significant correlation between the presence of Helicobacter pylori and epigastric pain. Gastritis at endoscopy was two times more frequent in patients with epigastric pain than in patients without it. Esophagitis occurred more in patients with heartburn, this was statistical significant. The others digestive symptoms were not related to endoscopic and histopathological findings. **Conclusion:** These data confirm the importance of investigate adolescents with digestive symptoms like epigastric pain and heartburn, mainly in developed countries.
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Key Words: *endoscopy, adolescents, dyspepsia, clinical-endoscopical correlation*

Background

Dyspepsia is a syndromic condition that may be described as upper abdominal pain or discomfort, early satiety, postprandial abdominal bloating or distention, nausea and vomiting with an estimated annual prevalence in Western countries of approximately 25–40%, accounting for 4–7% of all primary-care consultations.[1,2,3,4,5] The

initial management may include empiric antisecretory therapy, “test and treat” for Helicobacter pylori, “test and scope,” and prompt endoscopy.[6] Though individual studies have suggested that therapy based on endoscopy performed before any other study (early endoscopy) may be superior to empiric antisecretory therapy and as efficacious as a "test and treat" strategy in symptom relief.

Many dyspeptic patients will be treated empirically with acid-suppressive therapy without investigations, such as gastroscopy, being done to reach a definitive diagnosis. Endoscopic examination is essential for the classification of the patient’s condition as organic or functional, and in the current

clinical practice it is often the first investigation in the work-up of a patient with dyspeptic symptoms. The major abnormalities found are peptic ulcer, reflux esophagitis, gastro-duodenitis, and gastric malignancy.[7] In our country, endoscopy is the strategy preferred by general practitioners, who order it for all patients with persisting dyspeptic symptoms despite a course of antacids or prokinetic drugs. Such a choice in primary care is encouraged by the wide availability of endoscopy. Unfortunately, endoscopy is invasive and carries a risk of complications, albeit small, which may be unacceptable to the patient.[8] In some countries, it can be expensive and is often limited availability.[9] Attempts to identify those dyspeptic patients most likely to benefit from early endoscopy have met with variable success. Clinical parameters such as dyspepsia subtypes, age, and "alarm symptoms" have been shown to be poor predictors of endoscopic findings among patients with dyspepsia.[10]

The age of the patient at presentation is often used as a reason for referral for endoscopy. The American Gastroenterological Association recommends 45 years of age, the Canadian Dyspepsia Working Group 50 years.[11] The UK National Institute for Clinical Excellence and the Scottish Intercollegiate Guidelines Network have done away with the age criteria because of lack of evidence that age is a predictor of serious disease. The clinical dogma has always been that patients with alarm symptoms need urgent endoscopy. Uncomplicated dyspepsia is not a reason for urgent endoscopy. Uncomplicated dyspepsia was defined as any patient above 55 years of age with onset of dyspepsia within the past year or continued symptoms since the onset of dyspepsia.[12] Greater uncertainty exists about the optimal initial management of younger patients with uncomplicated dyspepsia; the exact age at which immediate investigation should be favored over attempts at empiric therapy is unclear.[13,14,15]

Adolescence is a period of transition between puberty and adulthood. It is a situation in wich the subject remakes his concepts about himself and that leads to abandon his infantil image and to project it in the future of his adult life, ambivalent, painful, characterized by fights with the family and its enviroment. This picture is frequently confused with crisis and diseases that makes the adult look for equivocal solutions.

The aim of the present study was to identify clinically significant endoscopic findings in adolescents with dyspepsia.

Methods

Patient data on all upper endoscopies performed in routine clinical practice at a medical center over a period of 6 months (April 2005 to September 2005) were prospectively collected using a dedicated electronic database. The participating institution is a community-based hospital, and serves as primary care center for their region. It had open-access endoscopy unit to which primary care providers could directly refer their patients without prior gastroenterological consultation. It is also a referral center for digestive disease. This

prospective database study is on consecutive uninvestigated outpatients complaining of dyspepsia who were referred for upper endoscopy.

The preselection of the patients by the referring general practioners was based exclusively on their agreement to undergo endoscopy, because all patients consulting their physician for any symptom of dyspepsia were considered fit for endoscopy. Dyspepsia was defined according to the Rome II Consensus criteria as "moderate-to-very-severe pain and discomfort centered in the upper abdomen lasting for at least 4 weeks". In the absence of alarm symptoms and chronic intake of nonsteroidal antiinflammatory drugs (NSAIDs), it was defined as "uncomplicated." Dyspepsia subtypes were categorized as reflux-like, ulcer-like, dysmotility-like, or unspecified as previously described.

A questionnaire was systematically submitted to all patients prior to endoscopy. It included multiple variables such as: age, sex, comorbidities and coprescriptions (including steroids and anticoagulants), regular NSAIDs intake, H. pylori infection, presence of any alarm symptoms and type of dyspepsia. The endoscopist entered the procedure data, including presenting symptoms, preprocedure diagnosis, recent tests, and diagnostic findings immediately following endoscopy. Critical variables including age, sex, comorbidities, procedure indication, and endoscopic findings were required fields for all patients. Only patients who had dyspepsia as an indication were considered. Follow-up patient visit records were excluded from the analysis.

Patients were included if they had dyspeptic symptoms; complete diagnostic examination of the esophagus, stomach, and duodenum; no proven preprocedure upper GI diagnosis; no previous variceal treatment, dilation, stenting, tumor ablation, or foreign body removal; and no recent endoscopy or barium meal. H. pylori infection was detected by rapid urease test and histology. Gastritis was diagnosticated according to the Modified Sydney System by Dixon.[16]

S.tatistics

Analysis of variance was used for the comparison of mean values, and the $\chi 2$ test with Yates' correction, the Fisher´s test and the odds ratio, when appropriate, were used for the comparison of proportions. The fifth percentile, i.e., the value of alpha error, was chosen as the cut-off point. A post-hoc analysis was performed for the calculation of statistical error. Finally, the variables used were age, sex, helmintic and protozoan infections, Helicobacter pylori infection, NSAID use and endoscopic and histopathologic findings.

Results

A total of 162 consecutive outpatients with dyspepsia asan indication for upper GI endoscopy were inserted in the structured database. The mean age of the sample was 16,42 yr. There were 120 females (74%) and 42 males (26%). A total of 69 patients (42,59%) were on NSAIDs in the past 30 days before endoscopy. Epigastric pain was the main clinical feature. There were 97 patients (59,87%) with moderate to severe epigastric pain for a minimum of 90 days. Half of the patients had heartburn about 3

days a week. Regurgitation was present in 49 patients (30,8%). The great majority had early satiety. Half of patients had nausea. Almost none had vomiting. There were 9 patients with hematemeses and none with melena and/or hematochesia. The main preprocedure diagnosis was gastritis in 135 patients (83%).

Endoscopic Findings

Gastitis was present in 68 patients (41,9%), esophagitis in 27 patients (16,7%), peptic ulcer in 12 (6,8%), 2 patients had gastric ulcers. Endoscopy was considered normal in 74 patients (45,7%). One patient had hiatal hernia, another ectopic pancreas and another Brunner's tumor of duodenum.

The rapid urease test was positive in 58,6% of patients. The fecal parasitologic test was submitted by 135 patients, and 45 patients (34%) had at least one parasite. All of these patients had Ascaris lumbricoides. Giardia lamblia and Entamoeba sp were prevalents.

In all patients was done biopsy and sent to hispathology. There were Helicobater pylori in 75,9% of patients. Considering rapid urease test and histopathology the prevalence of Helicobacter pylori was 78%. Gastritis was present in 70,9% of patients. All of them had antral gastritis and 75,6% corpus gastritis. The majority had superficial gastritis.

There was a significantly difference in the frequency of early satiety and nausea according to gender, with the number of those symptoms higher in females than in males. To another symptoms there was no difference.

No significantly diference was observed in the frequency of dyspeptic syntoms according to age.

There was a difference in the frequency of heartburn in patients that were on NSAIDS in the past 30 days. No difference to all other dyspeptic symtoms.

Although no association was observed between symptoms and each parasite alone (Ascaris lumbricoides, Entamoeba sp., Giárdia lamblia), a significantly association between all of them together and dyspeptic symptoms was observed (Table 1).

Patients with epigastric pain had 81% of probability of being infected by Helicobacter pylori, otherwise the probability for those that didn't have this symptom was 63%, and this was a significantly diference. There was no diference for others symptoms (Table 2).

Gastritis shown at endoscopy was two times more frequent in patients with epigastric pain (Table 3).

Patients complaining of heartburn showed a frequency significantly higher of esophagitis than patients with other symptoms and those with early satiety and nausea showed a frequency significantly lower than others (Table 4). There was no correlation between dyspeptic symptoms and peptic ulcer (Table 5).

TABLE 1 - Relation between signs and symptoms and infestation by intestinal parasites in a sample of adolescents from June to September , 2005.

Symptom	Total	Intestinal parasites[¶].		p-value
		N	%[§]	
"Epigastric pain":				
Absent	18	7	38,9	
Present	117	38	32,5	0,591[¥]
"Heartburn":				
Absent	61	13	21,3	
Present	74	32	43,2	0,007[¥]
"Regurgitation":				
Absent	94	31	33,0	
Present	41	14	34,2	0,895[¥]
"Early satiety":				
Absent	46	14	30,4	
Present	89	31	34,8	0,608[¥]
"Nausea":				
Absent	59	21	35,6	
Present	76	24	31,6	0,624[¥]
"Vomiting":				
Absent	109	39	35,8	
Present	26	6	23,1	0,217[¥]
"Hematemesis":				
Absent	129	44	34,1	
Present	3	1	16,7	0,663[£]

[¶]*A. lumbricoides* e/ou *Entamoeba sp* e /ou *G. lamblia*
[§]Probability.
[£] Fisher´s test.
[¥] $\chi 2$ test

TABLE – 2 Relation between signs and symptoms and the presence of H. pylori in a sample of adolescents from June to September, 2005.

Symptom	Total	*H. Pylori*		p-value
		N	%§	
"Epigastric pain":				
Absent	27	17	63,0	
Present	135	109	80,7	0,043¥
"Heartburn":				
Absent	78	57	73,1	
Present	84	69	82,1	0,165¥
"Regurgitation":				
Absent	112	83	74,1	
Present	50	43	86,0	0,093¥
"Early satiety":				
Absent	57	41	71,9	
Present	105	85	81,0	0,187¥
"Nausea":				
Absent	67	52	77,6	
Present	95	74	77,9	0,966¥
"Vomiting":				
Absent	126	100	79,4	
Present	36	26	72,2	0,363¥
"Hematemesis":				
Absent	153	120	78,4	
Present	9	6	66,7	0,417£

§Probability.
£ Fisher´s test.
¥ $\chi 2$ test.

TABLE 4- - Relation between signs and symptoms and the presence of esophagitis by endoscopy , a sample of adolescents from June to September , 2005.

Symptom	Total	Esophagitis		p-value
		N	%§	
"Epigastric pain":				
Absent	27	7	26,0	0,157¥
Present	135	20	14,8	
"Heartburn":				
Absent	78	6	7,7	0,003¥
Present	84	21	25,0	
"Regurgitation":				
Absent	112	17	15,2	0,447¥
Present	50	10	20,0	
"Early satiety":				
Absent	57	16	28,1	0,004¥
Present	105	11	10,5	
"Nausea":				
Absent	67	17	25,4	0,013¥
Present	95	10	10,5	
"Vomiting":				
Ausente	126	24	19,1	0,128¥
Presente	36	3	8,3	
"Hematemesis":				
Absent	153	27	17,7	0,358£
Present	9	0	0,0	

§Probability.
£ Fisher´s test.
¥ $\chi 2$ test.

TABLE 5 –Relation between signs and symptoms and the presence of ulcer by endoscopy, a sample of adolescents from June to September , 2005

Symptom	Total	Peptic ulcer		p-value
		N	%§	
"Epigastric pain":				
Absent	27	1	3,7	
Present	135	10	7,4	0,693£
"Heartburn":				
Absent	78	4	5,1	
Present	84	7	8,3	0,418¥
"Regurgitation":				
Absent	112	9	8,0	
Present	50	2	4,0	0,505£
"Early satiety":				
Absent	57	4	7,0	
Present	105	7	6,67	1,000£
"Nausea":				
Absent	67	6	9,0	
Present	95	5	5,3	0,358¥
"Vomiting":				
Absent	126	8	6,4	
Present	36	3	8,3	0,676¥
"Hematemesis":				
Absent	153	11	7,2	
Present	9	0	0,0	1,000£

§Probability.
£ Fisher´s test.
¥ $\chi 2$ test.

Discussion

The vast majority of individuals sought medical help because of stomach pain symptom . It is important to note that the minimum time of presentation of symptoms was 90 days , with burning characteristics and with a moderate to severe intensity .

The symptom of heartburn was quite prevalent in our study , occurring in 50 % of subjects . It is important to note that these individuals had a time of evolution of disease over 90 days with a symptom frequency of 03 times per week in most of these , which characterizes the clinical diagnosis of gastroesophageal reflux disease.[17] Sousa et al. investigating children and adolescents in Porto Alegre - RS with gastrointestinal symptoms , found a prevalence of 20% heartburn symptom.[18] In adults Thomson et al. noted that this prevalence is 38 % in Canada.[19]

Associated with heartburn symptom was observed that 30 % of subjects had acid regurgitation for a minimum of 90 days, which is sedimentary clinical diagnosis of this pathology. The clinical history is of great importance for diagnosis of disease reflux, heartburn is the most characteristic symptom of the disease, although also occur in other diseases of the upper digestive tract.[20] It is noteworthy that a significant contingent of patients with reflux disease, reflux esophagitis has not identifiable through endoscopy , which requires the completion of 24 hours esophageal pH monitoring .

Obtained a large number of individuals with early satiety and having nausea. Both symptoms are observed in patients with functional dyspepsia as the work done by Sarnelli et al. and Chitkara et al.[21,22] Nine individuals reported upper gastrointestinal bleeding as hematemesis , but at endoscopic examination there was no relationship with the pathologies encountered, nor the presence of active bleeding in these patients . One can explain this, because this symptom is associated with these individuals to acute mucosal or Mallory-Weiss syndrome , these conditions that heal spontaneously and cannot be identified by endoscopy , was performed after a few days.

Endoscopic findings in this sample are surprising, when it was observed that 41.9% of individuals had gastritis. This number is quite high when the fact is that in children and adolescents with digestive disorders are considered rare. It is important to emphasize that these results were found in individuals with signs and / or gastrointestinal symptoms with a time of evolution, mostly over 90 days . Ahmed et al[23], studied a rural population of 446 adolescents over 14 years in Pakistan, and who presented with dyspepsia , found a prevalence of 59.9 % of gastritis endoscopic examination. These data confirm the high incidence of endoscopic gastritis in adolescents.[24] Another finding is the relevance of reflux esophagitis was present in 27 subjects (16.7%) , two subjects observed esophagitis grade C rating for Los Angeles , which in clinical terms indicates a moderate to severe intensity . These numbers are similar to those found by Wang et al . in a study conducted in China , where he found a prevalence of 16.9 % of symptomatic gastroesophageal reflux disease of mild to moderate.[25] It is amazing the percentage of (6.8%) patients with peptic ulcer , highlighting that almost entirely these had multiple ulcers differentiating themselves from the general population .

The endoscopy was considered within the normal macroscopic patterns in 45.7% of examined , these numbers similar to those found by Thomson et al ., in Canada , obtaining 42% of normal exams. This shows us that the number of tests performed "unnecessary" is equal to developed countries . These patients can be framed within the concept of functional dyspepsia, since it does not show any organic substrate that could explain your symptoms.[26,27,28]

The association of dyspeptic symptoms with the presence of Helicobacter pylori remains controversial in the literature and the studies found no symptoms disappear when the eradication of this bacterium. It is important to remember that we are dealing with a country with high prevalence of

Helicobacter pylori in the general population. As the urease test was positive in 58.5 % of subjects and research of Helicobacter pylori at histology was positive in 75.9 % of subjects, the positivity for this bacteria was 78%. The question of the role of Helicobacter pylori infection in the pathogenesis of gastric cancer remains open , but there is abundant evidence of a close association of this bacterium particularly in infections contracted in childhood , with development initially superficial gastritis and chronic atrophic gastritis later.[29,30,31] The development of atrophic gastritis induced by Helicobacter pylori infection appears to trigger a cascade of events mutagenic cumulative and non-lethal , which promote clonal selection of cells in the gastric mucosa , manifesting aggressive and invasive. The age factor also appears to be critical to the development of multifocal atrophic gastritis, whereas infection by this pathogen contracted in adulthood tends to cause chronic antral gastritis, reduced secretion of somatostatin , consequently acid hypersecretion and duodenal ulcer.

The stool testing was performed by 135 individuals , which revealed a positivity in 34 % of these. The more this parasite was Ascaris lumbricoides , followed by Giardia lamblia and Entamoeba sp. The importance of these parasites is the fact that they can cause symptoms similar to gastroduodenal diseases , with special attention to the Giardia lamblia that colonizes the duodenum and triggers symptoms similar to those occurring in the peptic ulcer disease . There was no relationship between parasite infestation and the presence of digestive symptoms. Although there was a higher occurrence of heartburn in patients with Giardia lamblia. We can see that this parasite is not confounding factor for symptoms of gastrointestinal disorders . Contrary to that observed by Zalipaeva, when studying children and adolescents, in Russia , holders who had giardia and dyspeptic symptoms in 81.5 % of cases and concluded that at the age of 13 to 15 years the predominant symptoms were dyspepsia and abdominal pain.[32]

We found a probability of 81 % of patients with Helicobacter pylori present epigastric pain . This relationship was significant. Would really Helicobacter pylori be associated with functional dyspepsia? Perri et al., Lopez Gaston et al. and Sarnelli et al. , in studies with adults have found no relationship of Helicobacter pylori with functional dyspepsia.[33] Also Kalach et al. in a study of children observed no relationship of functional dyspepsia with Helicobacter pylori.[34] Does a real eradication of bacteria cause dyspeptic symptoms improve? Remember that even patients without epigastric pain the likelihood of Helicobacter pylori infection was 63 %. Bode et al., Reshetnikov et al. and Marzio et al., evaluating adult patients found no relationship between the occurrence of gastrointestinal symptoms and the presence of Helicobacter pylori[35,36,37], whereas in a study by Shmuely et al., this association was present.[38] When children and adolescents are studied the association Helicobacter pylori and gastrointestinal symptoms is quite evident.[39,40,41,42,43,44] These same patients who had stomach pain showed a 02 fold higher frequency of gastritis at endoscopy compared with those

who had no stomach pain. These are the same patients with Helicobacter pylori. It is likely that this relationship symptom versus endoscopically versus histological finding is much more likely than previously thought. In this work we can clearly see the correlation between these variables .

Conclusion

We conclude that adolescents with abdominal pain have a twice as likely to present gastritis endoscopy than those who do not exhibit this symptom. Reflux esophagitis is present in adolescents that have heartburn symptoms, especially when the evolution time exceeds 90 days. Unlike in adolescents there is a direct relationship between peptic ulcer and any digestive symptom. There is a quite relationship betweem H. pylori with dispeptic symptoms. Não existe relação entre a ocorrência de sintomas digestivos e a presença de parasitos intestinais, em nossa amostra. Quanto ao parasita Giárdia lamblia, em especial, não foi observado uma associação direta deste parasito com sintomas tais como dor epigástrica, plenitude ou náuseas.

As adolescence has its peculiarities and based on our results, we suggest using these criteria in primary care to request endoscopy.

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