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Clinico-Epidemiological Study of Peptic Ulcer Disease among Children in Three Tertiary Health Care Centres in Baghdad

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Abstract

Background Peptic ulcer is diagnosed at endoscopy where there is a mucosal break of 5mm or larger covered with fibrin. Mucosal breaks smaller than 5 mm are called erosions that do not penetrate the muscularis mucosa whereas an ulcer extends through the muscularis mucosa in the sub-mucosa.

Objective To determine the clinical picture, epidemiological aspectof peptic ulcer in children from birth to sixteen years of age and determine the relationship of the clinico-epidemiological aspect of the disease and the socio-demographic features.

Methods Fifty-three patients with an age ranged from birth to 16 years presented with gastrointestinal tract complaint and diagnosed to have peptic ulcer by endoscopic findings. The data was collected by viewing the case sheet of every child included in the study using special questionnaire to obtain socio-demographic information.

Results The mean age was (10.73±5.2) and the majority of the patients (54.72%) were in the age range (11-16) years old, with a male to female ratio of 2.5:1. Duodenal ulcer (66.04%) is more common than gastric ulcer (33.96%). There is significant association between age groups and type of peptic ulcer. Negative family history was found in (71.7%) of patients. Hematemesis is the most common clinical feature present in (69.81%).

Conclusions It is important to investigate children with recurrent abdominal pain, nocturnal pain and positive family history of the disease. Further studies for longer duration are required to follow up complications and healing or chronicity to the adult life.

Key words Peptic ulcer, children, clinico-epidemiological view.

Introduction

Peptic ulcer disease is uncommon in children. Understanding of the etiology, the investigation and treatment of this condition has changed markedly in recent years. The advent of pediatric endoscopy in the mid-1970s allowed visualization of peptic ulcers, whereas previously they had only been seen indirectly on barium contrast studies.

Similarly, the advent of H2 receptor blockers also in the mid-1970s and of proton-pumps inhibitors in the late 1980s revolutionized treatment. The discovery of *Helicopecter pylori* (*H. pylori*) switched the understanding of the etiology of peptic ulcer disease from that of an acid driven disease to an infectious disease [(1)]. Peptic ulcer disease has changed profoundly in the last decades in Western countries in both children and adults [(2,3)]. Indeed, the prevalence of *H. pylori*-positive ulcers has declined, and a new disease has emerged: *H.pylori*-negative gastric or duodenal ulcers (DU) [(4)].

In adults, most cases of the peptic ulcer are due to non-steroidal anti-inflammatory drugs (NSAIDs) and/or alcohol, and tobacco use can be associated, whereas in children they are not, and their etiology is mostly unknown as are their prevalence and long-term history *H.pylori*-

positive ulcers in children share some features with those in adults; they occur morefrequently inolder children and in males and recurrence rate is low if the infection is eradicated.

H. pylori-negative ulcers, due to unknown causes, are more frequent in younger children, do not have a gender preference, and tend to have a higher recurrence rate, particularly in Chinese children [5].

The natural history of peptic ulcers changed again after the discovery of *H. pylori*, when even in children, eradication of the infection was associated with a cure of theulcer without long-term recurrence [6].

A Canadian study has estimated an incidenceof 1 case per 2500 hospital admissions to a university hospital. Peptic ulcers in children can be classified into primary and secondary ulcers [7].

Secondary peptic ulcer disease develops as a result of the acute stress of a severe systemic illness such as head trauma or overwhelming sepsis, or as sequel to ingestion of ulcerogenic drugs such as NSAIDs or steroids. Excluding those secondary peptic ulcers, primary peptic ulcers are even less commonly seen in pediatric practice.

Single-center series from different parts of the world showed that primary peptic ulcer disease was diagnosed in only 1.8% to 3.6% of the total number of upper endoscopies performed to investigate gastrointestinal (GI) symptoms in children [8,9].

H. pylori infection is considered to be the most important cause of primary DU in children, and eradication of the bacteria is effective in preventing ulcer relapse [2,10].

The purpose of this study is to determine the clinical features like (epigastric pain, vomiting, hematemesis, etc.) and the epidemiological aspects like (age, gender, associated factors, etc.) of peptic ulcer disease in children from birth till 16 yrs old and to find out the association between the clinical aspects of the disease and socio-demographic characteristics of the children.

Methods

Arecord-based cross-sectional study was conducted in three hospitals in Baghdad capital; Children Welfare Teaching hospital, Gastro-intestinal and Liver diseases Center, Central Teaching Hospital of Paediatrics and Endoscopy Department in Baghdad Teaching Hospital from Dec. 2011 to the first of May 2012 and kept in the hospitals from 1-3 weeks for diagnosis and treatment. The study population included 53 children aged 0-16 year old who attended the selected hospitals and were diagnosed to have peptic ulcer by endoscopic findings. The data was collected by reviewing the case sheet of every child included in the study using special questionnaire form to obtain socio-Demographic information, clinical features and outcome at discharge.

Statistical analysis: Analysis of data was carried out using (Statistical Packages for Social Sciences- version 20). Standard Chi-square test (χ^2) was used to determine the associations between two categorical variables. Yates correction formula and fishers exact test were applied for chi-square test whenever it was needed. *P* value of less than 0.05 was considered as statistically significant.

Results

The classification of the patients of the study according to the type of ulcer showed that about two thirds of the sample was suffering from DU (66.04%) and the other one third was having gastric ulcer (GU) (33.96%).

The more prevalent age group was 11-16 years old (54.72%) while (24.53%) of the sample were between 6-10 years andonly 20.75% were at or below 5 years old (Table-1). Duodenal ulcer more common in age group (11-16) years old in 68.57% of cases, in 17.14% of cases the involved age group was (6-10) years, while in 14.29% of cases it is present in patients at or below 5 years. For GU 27.78% of cases at (11-16) years old, while 38.89% at (6-10) years old and only 33.33% at 5 years or below. The association between age groups and type of peptic ulcer were statistically of high significance (*P* = 0.018).

Regarding residency, about 73.58% of the study sample was living in urban areas; 35.9% of them were having GU.

This current study founded that 71.70% of the total number were male and 28.30% were female with a male to female ratio 2.5:1, when 65.71% of DU were in males and 34.29% were infemales. In GU, 83.33% were males and 16.67% were females. About 71.70% of the patients were having negative family history; while 28.30% had positive family history, only 31.43% of DU had positive family history compared to 22.2% with gastric ulcer (Table1).

Table 1. Distribution of the study group according to the relationship between type of ulcer and demographic characteristics

Demographic variations		Type of ulcer						*P* value
		Duodenal		Gastric		Total		
		No.	%	No.	%	No.	%	
Age (Yrs)	≤5	5	14.29	6	33.33	11	20.75	0.018
	6-10	6	17.14	7	38.89	13	24.53	
	11-16	24	68.57	5	27.78	29	54.72	
	Total	35	100	18	100	53	100	
Residency	Urban	25	71.43	14	77.78	39	73.58	>0.05
	Rural	10	28.57	4	22.22	14	26.42	
	Total	35	100	18	100	53	100	
Gender	Males	23	65.71	15	83.33	38	71.70	>0.05
	Females	12	34.29	3	16.67	15	28.30	
	Total	35	100	18	100	53	100	
Family history	Positive	11	31.43	4	22.22	15	28.30	>0.05
	Negative	24	68.57	14	77.78	38	71.70	
	Total	35	100	18	100	53	100	

Regarding the associated factors of the disease, the available information in the case sheets was used and this include: history of drug intake especially NSAID and the result was that only 14.29% of patients with DU and 16,67% of patients with GU have such a history, while 71.43% didn't report any drug intake. Regarding type of water given to the child 71.43% of cases of DU used tap water, 22.86% used bottled water and 5.71% used others, while for GU, 66.67% used tap water, 22.22% bottled water and 11.11% used others (Table 2).

About the clinical presentation of the disease, according to type of ulcer, the present study founded that the most common presentation was hematemesis in both types of ulcer, in DU it was found in 65.71% of cases while 77.78% of GU had hematemesis, the second most common presentation was epigastric pain that was found in 60% ofcases of DU and in 55.56% of cases of GU, malena was found in 51.43% of patients with DU, while in 55.56% with GU, crying episodes found in 11.43% of DU and in 33.33% of GU, finally, bleeding per rectum which is found in 14.29% of cases of DU and no such complaint in GU (Table 3).

Regarding the condition of the patients at time of discharge; in cases of DU, 65.71% had complete healing, while 34.29% still had the ulcer at discharge. In cases of GU, 66.67% had healing and 33.33% had ulcer at discharge, and the current study founded no death cases from the disease (Table 4).

Discussion

In the past two decades, primary peptic ulcer disease has been more widely recognized as a diagnosis worthy of consideration in the

pediatric age group [11]. In the present study, the most common age group at time of diagnosis were [11-16] years old, they represent 54.72% of the total number, while children at and below 5 years old representonly 20.75%, the mean for age was (10.73± 5.2) and this goes with Murphy et al, in Newcastle [12], who founded that the mean age at diagnosis was (11.2) years, and the children ranged from 4 to 15 years, and symptoms present in 46% before the age of 10and 15% before 6 years of age. Also it was found that in Chiang Bor-Luen, Taiwan [13], the mean age of 33 children with duodenal ulcer was 12.1±1.6 years that range (8-15 years), and in Goggin, Ireland [14], founded that the age range was 9.8-14.25 years and thatwas near to the results of the current study, also goes with Drumm et al, in Toronto [7], in which the mean age was 10 years.

Table2. Distribution of the study group according to the type of ulcer and different factors of the disease

Associated factors		Type of ulcer			
		Duodenal		Gastric	
		N	%	N	%
Drug Intake	NSIAD	5	14.29	3	16.67
	Others	5	14.29	4	22.22
	No drug intake	25	71.43	11	61.11
	Total	35	100	18	100
Stress factors	Sepsis	0	0	1	5.56
	Shock	0	0	0	0
	Intra-cranial lesion	1	2.86	1	5.56
	Burn	3	8.57	1	5.56
	None	28	80	11	61.11
	Others	3	8.57	4	22.22
	Total	35	100	18	100
Water supply	Bottled	8	22.86	4	22.22
	Tap	25	71.43	12	66.67
	Others	2	5.71	2	11.11
	Total	35	100	18	100

The young child is less likely to give an accurate description of symptoms, may be because of that there is a delay in the diagnosis of the disease so it appears more common in younger age group. This current study founded that of the 53 children 38 were males and 15 were females with a male to female ratio 2.5:1. This predominance of males agrees with that reported by Murphy et al, in Newcastle [12], which showed male to female ratio of 3.8:1. Chiang Bor-Luen, Taiwan [13], founded male to female ratio of 4.5:1, and in Goggin in Ireland [14], a sex ratio of 2:1, with the same results showed in Brendan Drumm et al in Toronto [7], with a ratio of 1.4:1.These higher results in males may be due to genetic elements.

Regarding family history, current study founded that only 28.3% have a positive family history and it is negative in 71.70% and this disagree with Murphy et al in Newcastle [12], that showed 62% at least one first or second degree relative had confirmed duodenal ulcer disease and in Goggin in Ireland [14], nine of 15 patients (60%) had a positive family history; but it goes with the results of Chiang in Taiwan [13] that founded a positive family history in 36% of 33 patients and close to the results of Drumm et al in Toronto [7], in which 26% of patients with primary duodenal

ulcer had a first degree relative with peptic ulcer disease. Genetic factors appear to play a role in the disease. A polygenic mode of inheritance has been proposed, studies in twins not only support this independence but provide strong evidence that the increased familial prevalence of peptic ulcer disease is due to genetic factors [15]. There is a study from Calcutta has shown that the (interleukin) IL-1B polymorphism is strongly associated with *H. pylori* related duodenal ulcer [16].

Table3. Distribution of the study group according to the clinical presentation and type of ulcer

Clinical features		Type of ulcer				*P* value
		Duodenal		Gastric		
		N	%	N	%	
Hematemesis	Yes	23	65.71	14	77.78	>0.05
	No	18	34.29	4	22.22	
Malena	Yes	18	51.43	10	55.56	>0.05
	No	17	48.57	8	44.44	
Epigastric pain	Yes	21	60.00	10	55.56	>0.05
	No	14	40.00	8	44.44	
Nausea	Yes	9	25.71	6	33.33	>0.05
	No	26	74.29	12	66.67	
Vomiting	Yes	10	28.57	9	50	>0.05
	No	25	71.43	9	50	
Feeding difficulty	Yea	8	22.86	5	27.78	>0.05
	No	27	77.14	13	72.22	
Crying episodes	Yes	4	11.43	6	33.33	0.054
	No	31	88.57	12	66.67	
Generalized abdominal pain	Yes	7	20	4	22.22	>0.05
	No	28	80	14	77.78	
Epigastric tenderness	Yes	15	42.86	8	44.44	>0.05
	No	20	57.14	10	55.56	
Bleeding per rectum	Yes	5	14.29	0	0	>0.05
	No	30	85.71	18	100	

Hematemesis occurred in 69.81% of cases, and malena was present in 52.83% of cases, that goes with the results of Drumm et al in Toronto [7], in which 10 of 17 children (58.8%) of secondary peptic ulcer had hematemesis and only one patient (5.2%) with primary peptic ulcer; but higher than Goggin in Ireland [14], that showed 6 out of 15 children (40%) had gastro-intestinal bleeding. It is important to realize that many ofthese children do not have the typical clinical pain syndrome of non-radiating epigastric pain, which begins several hours after eating, and is relieved by food, antacids, or vomiting. History of nocturnal pain in these children, however, is important. Apley's series of recurrent abdominal pain showed that only 7% of 118 children were woken at night by their pain [17].

Table4. Distribution of the study group according to the outcome at discharge and type of ulcer

Outcome at discharge	Type of ulcer			
	Duodenal		Gastric	
	N	%	N	%
Complete healing	23	65.71	12	66.67
Chronic ulcer	12	34.29	6	33.33
Total	35	100	18	100

This observation in the present study may be due, in part, to the inability of young children to verbalize the existence of pain. Episodes of vomiting had occurred in 35.85% that goes with Murphy et al [12], in which vomiting occurred in 39% of cases, while it is higher than the results of Goggin [14], in which 3 of 15 cases (20%) had vomiting. Vomiting is not infrequently a presenting complaint, but it usually occurs in association with abdominal pain and nausea. The exception is in children younger than 4 years of age, in as many as two thirds of whom it may be the only presenting symptom [15]. Epigastric tenderness was present in 43.4% of cases that is lower than percentage seen in Murphy et al [12], in which it was noted in 54% of cases. It was not usually a striking feature. Some degree of tenderness was noted, but its absence may relate to the state of activity of the disease at the time of examination found to have a duodenal ulcer subsequently suffer an episode of bleeding and with treatment the risk of this occurrence can be reduced. Bleeding per rectum founded in 9.43% of cases in the current study that is muchlower than Drumm et al, in Toronto [7], in which 14 of 17 children (82.3%) had lowergastro-intestinal bleeding.

The simultaneous decrease in the proportion presenting with overt gastrointestinal bleeding illustrates the fact that more of those being diagnosed in recent years have presented with abdominal pain rather than a complication of ulcer disease. Thirty-five of cases (66.03%) showed complete healing at time of discharge, 18 patients were already known to have achronic ulcer (33.96%) and there are no cases of death. The natural history of peptic ulcers changed again after the discovery of *H pylori*, when even in children, eradication of the infection was associated with a cure of the ulcer without long-term recurrence.

We conclude that duodenal ulcer is more common than gastric ulcer; males are more commonly affected than females; the most common presentation in the current study was hematemesis and abdominal pain; it is suspected that awareness of the commonly atypical presentation of this disorder, especially in young children might result in earlier diagnosis. It is important to advice long term follow up observation and maintenance therapy in children with chronic ulcer disease.

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