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Clinical Presentations and Pathogenic Agents of Bloody Diarrhoea among Iraqi Children

KEYWORDS: Bloody diarrhoea, Iraq, clinical feature, causative agents

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ABSTRACT *Diarrhea is the second leading cause of child morbidity and mortality, especially in the developing countries. A Cross–sectional study study was conducted with the objectives of determining the clinical features and pathogenic agents caused bloody diarrhea among Iraqi children. Random sample of 1500 children age less than or equal to 10 years old having diarrhoea were participated in this study. Stool samples were examined by divided each one into two portions, one portion used for direct general examination while the other was cultured for the detection the causative. The prevalence of childhood bloody diarrhea was 28%. Entamoeba histolytica infected all age groups with highest (97.5%), and lowest (20%) prevalence among age groups 1-3years and 4-6years old respectively. Salmonella and Shigella were found, 42.1%, 15.8% respectively more among the age group 4-6 years, 42.1%, 15.8% respectively. In conclusion, the prevalence of bloody diarrhoea among children less than 10 years of age presenting with diarrhoea in Baghdad is (28%). However, Entamoeba histolytica is the commonest and most frequent causative agent of bloody diarrhoea in children.. Meanover, fever, tenesmus, severe dehydration and convulsion were the significant characteristics of bloody diarrhoea among Iraqi children.*

Introduction

Global deaths from diarrhoea of children aged less than 5 years were estimated at 1.87 million approximately 19% of total child deaths. Diarrheal disease continues to be a serious health problem, especially in developing countries, where it is the second leading cause of child morbidity and mortality [1].

Bloody diarrhea represents approximately 20-30% of all diarrheal cases [2], and compared to watery diarrhea, bloody diarrhea generally lasts longer, and associated with more complications [3]. It accounts for about 15% of diarrhea-associated deaths in this age group worldwide [3]. Hence, bloody diarrhea should be considered a medical emergency.

Clinical diagnosis of bloody diarrhea is based on the presence of visible blood in the diarrheal stool. That contains numerous pus cells, these features suggest infection with bacterial agents. However in some episodes of shigellosis, the stool is initially watery, becoming bloody after 1-2 days [4].

The bacterial pathogens associated with bloody diarrhea include species of Shigella, Campylobacter, Salmonella, Escherichia coli pathotypes. The prevalence of these agents and their antimicrobial susceptibility patterns vary among different regions [2].

In Iraq diarrheal diseases is the second common cause of mortalities among children [5]. According to the annual report of the Iraqi Ministry of Health childhood diarrhea is increasing during the last decade, particularly following the last war in 2003 and the sanitary condition with general hygiene all over Iraq had been deteriorating [5]. Since identification of pathogens with clinical presentations, would help local health care providers to reduce morbidity and mortality due to bloody diarrhoea, this study was conducted in order to identify the prevalence, clinical presentation, and the most common pathogenic agent causing bloody diarrhea among Iraqi children less than ten years old.

Methodology

Cross–sectional study was conducted in Baghdad; the capital of Iraq. Two Paediatric hospitals were chosen, 1st located at the AL-Rasafa side (AL-Manseur Paediatric Teaching Hospital), 2nd located at AL-Karkh side (The Central Paediatric Teaching Hospital). Random sample of 1500 children age less than or equal to 10 years old, having diarrhoea were participated in this study. Children having black stools or streaks of blood on the surface of formed stool and children who had received antibiotics or any other treatment during their illness were excluded. Also children accompanied by person other than their mother were excluded from this study. Mother's child exclusively was interviewed by the researchers using questionnaire. Each participant was examined clinically by the pediatrician to assess the presence as well as the degree of dehydration and categorized it, to three grades (mild, moderate & severe). Then, fresh stool sample was obtained from each participant using a sterile container. Stool sample was divided into two portions, one portion used for direct general stool examination while the other was cultured for the detection of the causative bacteria of bloody diarrhoea according to routine methods.

The ethical and Review Committee in Ministry of Heath-Iraq, reviewed and approved the protocol of this study. Informed consent was obtained from all mothers.

Data was analyzed using SPSS 16.0. Chi square test was used and P-value of <0.05 was considered as statistically significant.

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Results

Our study revealed that 52% of diarrheic children having fever, which was significantly higher (61.9%) among those having bloody diarrhea than (48.2%) those having no bloody diarrhea (P<0.0001) [table 1]. Of all 1500 patients, 46.4% of them were presented with vomiting. Although not significant (p= 0.19) difference in rate of vomiting between two groups (having bloody or non bloody diarrhea) of patents but it was higher (49.3%) among those having bloody diarrhea. Out of 1500 children, 573 (38.2%) were presented with deferent degree of dehydration (mild, moderate & sever), and dehydration was significantly higher (62.6%) among those with bloody diarrhea (P<0.0001) (table 1). Table 1 shows 70.7% of those having bloody diarrhea presented with tenesmus which was significantly more than twice (33.3%) higher than those with non bloody diarrhea (p<0.0001).

Table 1. Clinical features of patients with and with-out bloody diarrhea (n=1500)

Clinical features	Bloody diarrhea N=420	No-bloody diarrhea N=1080	Total	X^2.	p.value
	No. (%)	No (%)	No.(%)		
Fever Yes	260 (61.9%)	520 (48.2%)	780 (52%)	22.38	P<0.0001
No	160 (38.1)	560 (51.8%)	720 (48)		
Vomiting Yes	207 (49.3%)	490 (45.4%)	697 (46.4%)	1.71	P=0.19
No	213 (50.7%)	59 (54.6%)	803 (53.6)		
Dehydration Yes	263 (62.6%)	310 (28.7%)	573 (38.2%)	145.9	P<0.0001
Mild	60 (14.3%)	120 (11.1%)	180 (12%		
Moderate	183 (43.6)	180 (16.6%)	363 (24.2%)	19.63	P<0.001
Severe	20 (4.8%)	10 (0.93%)	30 (2%)		
No	157 (37.4%)	770 (71.3%)	927 (61.8)		
Tenesmus Yes	297 (70.7)	360 (33.3%)	657 (43.8%)	170.1	P<0.0001
No	123 (29.3%)	720 (66.7%)	843 (56.2%)		
convulsion Yes	50 (11.9%)	50 (4.6%)	100 (6.7%)	24.56	P<0.0001
No	370 (88.1%)	1030 (95.4%)	1400 (93.3%)		

The most common causative pathogenic agent (83.58%) was Protozual infestation (Entamoeba histolytica), while bacterial infection (Non-Typhoid, Salmonella & Shigella) constituted only 6.42% of cases of bloody diarrhea, in which 4.28% and (.14%) of stool samples exhibited Salmonella and shigella respectively. On the other hand 42(10%) stool samples showed negative culture

Significant association was detected between type of causative pathogenic organism for bloody diarrhea and age of the child P<0.0001 . (table2)

Table2. Distribution of the causative organisms according to the age groups of the patients.

Age group (year)	E. hist.	Salmonella	Shigella	causative organisms +ve	causative organisms -ve
	No. (%)	No. (%)	No. (%)	No	
< 1 (n=120	99 (82.5)	5 (4.**2**)	2 (1.**7**)	106	14
1 – 3 (n=270	237 (87.8)	3 (1.**1**)	3 (1.**1**)	243	27
4 – 6 (n=20	8 (40)	8 (42.1)	3 (15)	19	1
7 – 9 (n=10	7 (70)	2 (20)	1 (10)	10	0
Total 420	351 (83.**6**)	18 (4.**3**)	9 (2.1)	378	42

X^2=91.5 P <0.0001

Discussion

This study revealed that 28% of Iraqi children with diarrhea, their stool contains blood. This rate is within the rang reported by other researchers [5], however, our prevalence is more than what Dhia et al., 2011 [6], who detected that 10% of diarrhea episodes in children under five years of age have visible blood in the stool .This difference may attributed to the difference in age of the study population.. Additional to the deffirences in maternal and infant nutritional status which reflect on the immunity of the child. Moreover, antimicrobial resistance among the major bacterial causes of bloody diarrhea is increasing worldwide [7].

Current study detected that the main pathogenic organism of bloody diarrhea in Iraq was (83.58%) E. histolytica, this supports other research findings [7]while the bacterial pathogens constitutes about (6.42%) composed of Salmonella and Shigella, similarly in other areas. [7]

Interestingly, our study gave evidence that bloody diarrhea has significant association with dehydration as well as the severity of dehydration compare to non bloody diarrhea. This was contradict with Al-Rubaii ES 2001, [8] .The possible explanation of our result through what was reported by Sharon L. Roy.2012 [9], that amebiasis tends to present with more insidious symptoms than bacterial dysentery. Another study stated that Children infected with bacterial diarrheagenic pathogens often have abdominal pain; the absence of abdominal pain provides some assurance that the bloody diarrhea is not of bacterial origin .In agreement with several authors [8, 10]. our study supporting the evidence that tenesmus was the main associated clinical features of bloody diarrhea.

Our study failed to detect any association between bloody diarrhea and vomiting as presenting symptom. This probably could be explained that vomiting is mostly associated with nontyphoidal salmonellosis &Shigellosis while it is not a common features of amoebic dysentery [6,11] .

The significantly association of convulsion with bloody diarrhea, this was in agreement with several authors [11-12]. This could be due to the fact that rapid rise in temperature is the main cause of convulsion as well as anorexia, dehydration, malabsorption of the nutrients, loss of fluid.

Conclusion

Prevalence of bloody diarrhoea among children less than 10 years of age presenting with diarrhoea in Baghdad is (28%). However, Entamoeba histolytica is the commonest and most frequent causative agent of bloody diarrhoea in children included in this study. Meanwhile, fever, tenesmus & convulsion are the main characteristics of bloody diarrhoea also dehydration mainly the severe degree.

Conflict of Interests

None declared.

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