# Etiology and Clinical Manifestations of Infectious Bloody Diarrhea in Children Welfare Teaching Hospital

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## ABSTRACT:

**BACKGROUND:**

Dysentery is an important cause of morbidity and mortality among children less than five years, it is caused by viral, bacterial, or protozoan infections or parasitic infestations. About 10% of all diarrheal episodes in children less than five years are dysenteric, but these causes about 15% of all deaths attributed to diarrhea are dysenteric.

**OBJECTIVE:**

To highlight the causes and clinical manifestations of bloody diarrhea in children younger than six years of age and to clarify the most important associated factors.

**METHODS:**

A prospective study was carried out on Children Welfare Teaching Hospital /Medical city/Baghdad, on 92 children who were admitted to the hospital with bloody diarrhea, their ages ranged between two months -6 years. The period of study is from (first of November 2013-30th of April 2014). A thorough history were carried out, general stool examination and stool culture were done by taking fresh stool samples collected from these children and underwent to serial investigations. Any patients who had received antibiotics during their illness were excluded from the study.

**RESULT:**

Ninety two patients their age ranged from second month of life till 6 years old that admitted to the children welfare teaching hospitals because of bloody diarrhea. The most common microorganism isolated was *E .histolytica* 59(64.13%) followed by *Shigella spp.*11 (11.96%).

It was found that male 51(55.43%) and female 41(44.57%), most of them live in urban 39(42.40%) or suburban 31(33.69%) area, most of them consume tap water 47(51.08%),more than half of them with mixed feeding 42(56.75%), the most common age group affected was the first two years 74(80.43%).

Regarding the clinical presentation it was found that in amoebic dysentery the most common finding was tenesmus 52(88.13%),followed by fever 35(59.32%), vomiting 19(32.20%),then convulsion4(6.77%), while in Shigellosis the most common finding was fever 9(81.81%), followed by tenesmus 8(72.72%),vomiting7(63.63%), then convulsion 4(36.36%).

**CONCLUSION:**

*E. histolytica* was the most common microorganism isolated in patients with bloody diarrhea and the most common age group affected was the first two years of life.

Mixed feeding in the first two years was associated with higher rate of infection

Consuming of boiled water associated with least incidence of bloody diarrhea and the most common presentation were tenesmus, fever, vomiting, and convulsion.


**KEYWORDS:** bloody diarrhea.

## INTRODUCTION:

Dysentery is a clinical presentation of inflammation of the large intestine characterized by diarrhea (>3 loose stools in a 24-h period) with blood and/or mucus in stool associated with abnormal crumps, painful straining (tenesmus) and fever [1, 2].It is an important cause of morbidity and mortality, about 10% of all diarrheal episodes in children less than five years are dysenteric, but these cause about 15% of all deaths attributed to diarrhea [3].

Dysentery results from bacterial, protozoan infections or parasitic infestations and viral infections. These pathogens typically reach the large intestine after entering orally, through ingestion of contaminated food or water, oral

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contact with contaminated objects or hands, and so on [4]. Shigellosis is endemic throughout the world where it is held responsible for some 120 million cases of severe dysentery, the overwhelming majority of which occurs in developing countries and involves children less than five years of age. About 1.1 million people were estimated to die from Shigella infection each year, with 60% of the deaths occurring in children under 5 years of age.In the developed countries, severe dysentery may be caused by shigellosis, an infection by bacteria of the genus Shigella and is then known as bacillary dysentery (or Marlow Syndrome). [5]

*E.histolytica* occurs widely, but most often in subtropical and tropical countries, *E. histolytica* cause bloody diarrhea after invading epithelial cells in colon resulting in microabscesses and ulcer[6], it is the 3rd leading parasitic cause of death worldwide. Prospective studies have demonstrated that 4-10% of individuals infected with *E.histolytica* develop amebic colitis. [7]

With correct treatment, most cases of amoebic and bacterial dysentery subside within 10 days, and most individuals will achieve a full recovery within 2 to 4 weeks after beginning proper treatment. If the disease is left untreated, the prognosis varies with the immune status of the individual patient and the severity of disease. Extreme dehydration can prolong recovery and significantly raises the risk for serious complications. [8]

## AIM OF THE STUDY:

Is to study the causes of bloody diarrhea in children under six years of age to illustrate some of the associated factors accompanying bloody diarrhea and to clarify the most important clinical presentations.

## MATERIALS AND METHODS:

A hospital -based study was carried out at Children Welfare Teaching Hospital /Medical city/Baghdad on 92 children who were admitted to the hospital with bloody diarrhea, their ages ranged between two months -6 years. The period of study is from (first of November 2011-30th of April 2012). Any patients who had received antibiotics during their illness were excluded from the study.

Data, including name, age, sex, residency, type of diarrhea, fever, other gastrointestinal symptom, neurological symptom, feeding history (breast, bottle, mixed) and source of water supply were recorded.

For each child the following investigations were carried out:-

1- Fresh stool specimens (not more than 30 minutes) were collected and send for microscopical examination in laboratory to be checked for presence of RBC, WBC, and *Entamoeba histolytica* trophozoites and cysts. This was repeated 3 times.

2- Fresh stool is cultured on MacConkey agar, *Shigella-Salmonella* (SS) agar and tetrathionate broth, incubated aerobically for 18-24 hours at 37 C°.

3- Growth from tetrathionate broth was subcultured on SS agar for additional 24 hours at 37 C° in order to enhance the growth of bacteria and yield better results, and used to isolate *Salmonella* and *Shigella* species[9]. Cultures and tests for other microorganisms (e.g. *Campylobacter* and *Yersinia* species) and for rotavirus were not available in our laboratory.

## RESULTS:

Regarding the causative agents of bloody diarrhea results it was found that the most common enteropathogen isolated was *Entamoeba histolytica* 59(64.13%) followed by *shigella* 11(11.96%) then *salmonella* 5(5.44%) as shown s in (table-1).

Total numbers of 92 cases with bloody diarrhea were included; Most of the patients included in the study were less than 2 years of age 74(80.43%).

There was trivial difference in male/female ratio 51(55.43%) were male and 41(44.57%) were female, most of the patients live in urban area 39(42.4%) and to lesser extent in suburban then rural area. And regarding water supply it was found that 47(51.08%) patient were consumed tap water, 24(26.09%) were consumed bottled water and to lesser extent boiled water and other sources as in (table-2).

74 patients (age <2 years) ; In more than half of them was found that mixed feeding is the most common type of feeding 42(56.75%), followed by bottle feeding 12(16.22%) then ordinary family diet 11(14.86%) as shown in (table-3).

The most common age group affected was the first 2 years of life 74(80.43%) followed by the age group of (>2yrs- 4yrs) in 10(10.86%) patients, then the age group of (>4yrs- 6yrs) in 8(8.69%) patients as shown in (table-4).

The other clinical features noticed in patients with bloody diarrhea were found as follow: in *Entamoeba histolytica*; tenesmus in 52(88.13%), fever in 35(59.32%), vomiting in 19(32.20%), and convulsion in 4(6.77%).

In *Shigella spp.*; fever in 9(81.81%), tenesmus in 8(72.72%), vomiting in 7(63.63%), and convulsion in 4(36.36%).
In *salmonella spp.*; tenesmus in 4(80%), fever in 4(80%), vomiting in 3(60%), and convulsion in 2(40%).
In *Escherichia coli*; fever in 3(100%), tenesmus in 2(66.66%), convulsion in 1(33.33%), and vomiting in1 (33.33%) as shown in (table-5).

**Table 1: The isolation rate of enteropathogens in children with bloody diarrhea.**

| Microorganism | Number(Percentage) |
|---|---|
| Entamoeba histolytica | 59(64.13%) |
| Shigella spp. | 11(11.96%) |
| Salmonella spp. | 5(5.44%) |
| Escherichia coli | 3(3.26%) |
| No detectable microorganism or unavailable investigations | 14(15.21%) |
| Total | 92(100%) |

**Table 2: The relation of sex, residency, and water supply with bloody diarrhea.**

| | | Number | (percentage) |
|---|---|---|---|
| Sex | Male | 51 | (55.43%) |
| | Female | 41 | (44.57%) |
| Residency | Urban | 39 | (42.40%) |
| | Suburban | 31 | (33.69%) |
| | Rural | 22 | (23.91%) |
| Water supply | Boiled | 13 | (14.13%) |
| | Tap water | 47 | (51.08%) |
| | Bottled | 24 | (26.09%) |
| | Other sources | 8 | (8.70%) |

**Table 3 : Feeding (For the first 2 years old) total 74 patients.**

| Type of feeding | Number | Percentage |
|---|---|---|
| Breast feeding | 9 | 12.17% |
| Bottle feeding | 12 | 16.22% |
| Mixed | 42 | 56.75% |
| Ordinary family diet | 11 | 14.86% |
| Total | 74 | 100% |

**Table 4:Distribution of cases according to age group.**

| Age group | Number | Percentage (%) |
|---|---|---|
| 2 mo.- 2yrs | 74 | 80.43% |
| >2yrs- 4yrs | 10 | 10.86% |
| >4yrs- 6yrs | 8 | 8.69% |
| Total | 92 | 100% |

**Table 5: Other clinical features of patients with bloody diarrhea.**

| Microorganism | Tenesmus | Fever | Convulsion | Vomiting |
|---|---|---|---|---|
| Entamoeba histolytica | 52(88.13%) | 35(59.32%) | 4(6.77%) | 19(32.20%) |
| Shigella spp. | 8(72.72%) | 9(81.81%) | 4(36.36%) | 7(63.63%) |
| Salmonella spp. | 4(80%) | 4(80%) | 2(40%) | 3(60%) |
| Escherichia coli | 2(66.66%) | 3(100%) | 1(33.33%) | 1(33.33%) |
| No detectable microorganism | 6(42.85%) | 8(57.14%) | zero | 3(21.42%) |

## DISCUSSION:

The current study included cases of infectious bloody diarrhea in children less than six years of age; revealed that *E .histolytica* was the commonest microorganism identified from the patient in 59(64.13%), *Shigella spp.* 11(11.96%), and to lesser extent *Salmonella spp.* 5(5.44%) and *Escherichia coli* in 3(3.26%).Which is approximate to previous studies done in Iraq by Rabatti A A. [10], Al-Kubaisy W. [11]. Also in other studies done in China by Lai-SW et al. [12] which revealed 67.6% (*E .histolytica*) versus 13.1% % for *Shigella spp*). The opposite finding was reported in other studies done inside and outside Iraq which showed that *E.coli* (48.3%) was the most common pathogen followed by *E.histolytica* (33.7%) by AL-Obaidi H.*et al* [13]

While other studies revealed that *Shigella spp*. were the most common cause associated of bloody diarrhea including Ronsmans et al. [14] (*E .histolytica* trophozoite 30% while *Shigella spp*. 50%), and Huilan S. *et al.* [15] who found that *Shigella spp*. were the most frequently isolated pathogen from the stools of young children with bloody diarrhea in developing countries. The difference in results that obtained could be explained by the fact that invasive amoebiasis is an important public health problem and occurs globally in endemic area (WHO), 1985.[16] On the other hand, the difficulties encountered in isolating enteric pathogen such as *Shigella spp*.by conventional techniques. [17] Or it is due to misuse of antibiotics in our community. Regarding the gender, it was found that slight preponderance to male gender than female (55.43%) which is quite similar to Al-Kubaisy W. [11] in Iraq (62.4% ) , Kuşkonmaz B .[18] in Turkey (55%), bravo LC.[19] in Philippine (71.2% ) .

Place of residence (geographical variation) has been shown to be another form of discrepancy. It was found that most of the cases from urban and suburban areas (70%) which is quite similar to Al-Kubaisy W. [11] in Iraq, this result because all cases were collected from Children Welfare Teaching Hospital in the center of Baghdad city in addition to shrinkage of the rural areas in Iraq.

The higher percentages of bloody diarrhea was found in patients with mixed feeding followed to a lesser extent with bottle feedings which is disagree with other studies done by Rabatti A A. [10], Al-Kubaisy W. [11], and bravo LC.[19] which may be explained by distraction of attention between breast and bottle feeding..

The most common age group affected was the first two years of life which is agree with other studies Rabatti A A. [10], AL-Obaidi H.*et al*[13], and Khalil K. et al in Pakistan[20]

And this may be explained by declining level of maternal immunity that transferred during fetal life, in addition to introduction of solid food which may be contaminated by enteropathogens, or accidental introduction of foreign material to the mouth of the crawling babies.

Regarding the clinical findings of bloody diarrhea, it was found that amoebic dysentery is frequently associated with tenesmus (88.13%), fever (59.32%), vomiting (32.20%) while convulsion occurs in (6.77%) which was quite consistent with the results obtained by AL-Obaidi H.*et al* [13] and Midzi SM [20] et al in Zimbabwe. In Shigellosis the most common finding was fever (81.81%), followed by tenesmus (72.72%), vomiting (63.63%), and then convulsion (36.36%). Which disagree with Townes J M[21] in Bolivia found, tenesmus (79%), fever (42%), while convulsion occurs in (18%) which may be due to the small sample size in this study.

In this study it was found that undetected microorganism in14 (15.21%) and this result is agree with Rabatti A A. [10] who showed (28.5 %) but disagree with Brooks [22] et *al* in Kenya (2%), and this result may be explained by unavailability of specific investigations for Campylobacter, Yersinia species and for rotavirus at time of the study in addition to heavy haphazardly misuse of antibiotics in our society which interrupt the culture and sensitivity results.

## CONCLUSION:

*E. histolytica* was the most common microorganism isolated in patients with bloody diarrhea.

The most common age group affected was the first two years of life.

Tenesmus, fever, vomiting and convulsion were the most common presentation in patients with bloody diarrhea.

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