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EPIDEMIOLOGY OF BLOODY DIARRHEA IN AL-MANATHERA CITY / NAJAF ALSHRAF PROVINCE. IRAQ

Haitham Mohammed Al-Awadi and Thikra Ghaly Youssef

University of Kufa, Faculty of Education for Girls, Department of Biology, Al-Najaf, Iraq

Abstract

Throughout the period from 1/7/2017 till 1/2/2018, 720 stool samples from diarrhea patients who attended Al-Manathera Hospital which is within boundaries of An-Najaf province, were examined. The results revealed that 305(42.4%) of the patients have bloody diarrhea, with around 221(72%) of the cases being infected with *Entamoeba Histolytic*. New born to 24 years old patients has high frequency of occurrence of Amoebiasis compared with shigellosis 222(72%), 84(27.5) respectively. The results also show that male are more prone to infection for both diseases and people from rural areas are more prone to get infected with bloody diarrhea Amoebiasis and shigellosis, Furthermore; infected family members with the patient in the family was 152 (68.7) for Amobiasis compared with shigellosis 44 (52.3). Mixed infections were more dominant in stool samples of people infected with *E.histolyica* 153 (61). *Shigellosis sonnei* is the main bacteria that causes dysentery 16 (19%) in our study.

Key words: Blood diarrhea, Al-Manathera,; *Shigellosis.*

Introduction

Dysentery is a type of gastroenteritis that results in diarrhea with blood (Zhaorui *et al.*, 2016) other symptoms may include fever, abdominal pain and feelings of incomplete defecation. It is caused by several types of infections such as bacterial, viral, or parasitic (worm or protozoa). The mechanism is an inflammatory disorder of the intestine, especially of the colon (AMREF, 2009).

Amoebiasis, also known as amoebic dysentery is an infection of the intestine (gut) caused by amoeba called *E. Histolytica* that, among other things, can cause severe diarrhea with blood, complications can include inflammation of colon with tissues death or perforation, which may develop into anemia due to loss of blood (David M.K., 2014) (Gonzaiez A., *et al.*, 2008).

Shigella species, member of the *Enterobacteriaceae* spp, are responsible for causing acute gastroenteritis which is one of the most common causes of morbidity and mortality among children in the developing countries. *Shigellosis* is antibiotic-resistant strains of different *Shigella* species, and serotypes have emerged all over the world (Yang, *et al.* , 2007) (Levin, *et al.*, 2007).

Several important risk factors contributed to the prevalence of bloody diarrhea, like an unhygienic environment, poor environmental sanitation, use of unsafe water for domestic purposes, poor personal hygiene, inappropriate storage of food and processed food (Al-Haddad, 2010).

World health organization (WHO) reported that, globally, nearly nine million children under five years of age die each year (WHO, 2009). Boschi, *et al.*, 2008, reported that the estimated global death of children age less than years from diarrhea was 1.87 million, approximately 19% of total child death .

Many studies in Iraq investigated the diarrheal disease in Iraqi provinces (Waqar Al-Kubaisy, 2015) (Noor Abdulhaleem, 2017) (Dhia H., 2011).

The present study was conducted to measure the burden and determinants of the increasing problem of this disease by identifying the prevalence factors associated with it in Al-Manathera city/An-Najaf Al Ashraf province for the first time.

Materials and Methods

In this study (720) stool Samples from diarrheal patients were collected from Al-Manathera hospital during

the period from July 1st, 2017 to February 1st, 2018. Stool samples from each patient were collected in clean, fit-covered containers and transported to the laboratory of (Al-Manathera hospital) under cooling. Then, the samples were examined by the naked eye before being microscopically examined for color, consistency, blood, and mucus. Then, they were microscopically examined in search for any presence of *E. Histolytica* by the direct method using normal saline under high power (× 40) to detect the presence of Trophozoite and cyst.

For *Shigella* isolation, stool specimen were inoculated into tubes of thiocyanate enrichment broth and incubated at 40^0c for 24 hours. On the second day the grown culture was a subculture in salmonella-Shigella agar. Detection of *Shigella* from *salmonella-Shigella* agar colonies were identified by IMVIC test (Indole test, Methyl Red test, VP test, and Citrate Agar). H_2S production from Klingler, motility, and then diagnosis was confirmed by specific antisera for *Shigella* spp.

Data about age, sex, residence etc. were recorded for each patient by special questionnaire.

Result

The over-all prevalence of stool samples examined for dysenteric patients. From a total of 720 stool samples, 300 (42.4%) of them were identified to cause bloody diarrhea in Al Manathera city.

Table 2 The prevalence of the pathogenic microorganisms in stool samples examined in Al Manathera city. The *E.histolytica* was most prevalent in the stool (n= 68.75%) while *Shigella spp* was less (n= 221. 24%).

Table 1: The over-all prevalence of bloody diarrhea in Al Manathera city.

	No.of host examined	No.of host infected	prevalence %
Stool samples	720	305	42.3

Table 2: The distribution of the cases according to the type of microorganism.

Type of microorganism	Patient No (%)
E. histolytica	221(72.5)
Shigellosis	84(27.5)

Table 3 Illustrates the highest frequency of acute Amoebiasis and shigellosis among 0-24 years old age group, while older age groups show a decline in the number of cases.

Table 3: Age distribution of cases with bloody diarrhea.

Age group Year	Amoebiasis No(%)	Shigellosis No(%)	p value
0-12	75(33.9)	23(27.3)	
13-24	50(22.6)	21(25)	
25-36	36(16.2)	12(14.3)	<0.05
37-48	21(9.5)	12(14.3)	
49-50	20(9)	12(14.3)	
51-upove	19(8.6)	10(11.9)	

Table 4. shows that male children for both microorganisms was more suitable than female children ($p > 0.05$)..

Table 4 : Gender distribution of the cases with both microorganisms.

Gender	Amoebiasis No(%)	Shigellosis No(%)	p value
Male	131(59)	60(71)	
Female	90(40.7)	24(28.5)	>0.05

Table 5 shows that the distribution of both microorganisms according to the residency. High prevalence of infection occurs in people who live in urban areas ($p > 0.05$).

Table 5: Prevalence of both disease cases according to the residence.

Residence	Amoebiasis No(%)	Shigellosis No(%)	p value
Rural	144(65)	55(65.4)	
Urban	77(34.8)	29(34.5)	>0.05

Table 6 shows that the frequency of other members suffering from the same diseases at the same time was higher among *Shigella* spp case in comparison with amoebic cases ($p > 0.05$).

Table 6: Distribution of the cases according to the presence of other family member carrying the same disease.

Other family Member	Amoebiasis No(%)	Shigellosis No(%)	p value
Present	152(68.7)	44(52.3)	<0.05
Absent	69(31.2)	40(47.6)	

Table 7 shows the distribution of *Entamoeba Histolytica* stages in stool samples of patient with Amobiasis with high prevalence of mixed stages of this parasite 153(61) .

Table 7: The distribution of *E. histolytica* stages in Dysentery stool samples.

Parasite	No.	Trophozoite	Cysts	Mixed
E.histolytica	221	21(9.5)	56(25.3)	153(61)

Table 8 shows the distribution of *Shigella spp* types in stool samples of patient with shigellosis with high frequency of *Shigella* sonni 16(19).

Table 8: The distribution of *Shigella* spp stages in Dysentry stool samples.

No.	*Shigella Sonnei*	*Shigella flexneri*	*Shigella dysenteria*
84	16(19)	8(9.5)	60(71.4)

Discussion

In developing countries, the diarrhea is the leading cause of morbidity and mortality among children, where an estimated 1.3-3.2 thousand million episodes million episodes while, 3.2 million death occur each year in those under five years of age (Ali, 2013).

In Al Manathera city/ Iraq, the high rate of incidents of bloody diarrhea are due to several factors, including the lack of clean drinking water and relying on river water directly as a source of clean water, and lower health and cultural level of the rural population as well as the lack of hospitals and health centers in this city, as well as use of animal wastes and human feces, sometimes even as an organic fertilizer for the growth of plants and vegetables (Mais, 2016).

The *E. histolytica* was most prevalent in comparison with shigellosis in stool samples. This finding come in agreement with Previous studies that demonistrated that Amoehiasis commonly cause bloody diarrhea in Iraq (Waqar Al-Kubaisy, 2015). In the present study and other studies. The high prevalence of this parasite in human suggest the wide spread contamination of environment with cyst of the parasite, Amoebiasis is transmitted by fecal contamination of drenching water and food and by direct contact with dirty hands or objects theorehcally the ingestion of one viable cyst is an infectious does, Houseflies spread the cysts and the crowded situations of poor hygiene in temperate urban environment is an important mechanism of spread (Munazza E., 2011).

Smaller age groups which are more suitable to get infected with both parasitic or bacterial agents was found in Al Manathera city during the current study. This agreed with the results of other studies on dysentery (Al-Rubai, 2001) (Henry, 1991).

Susceptibility of these age groups to dysentery can be explained by many factors such as a declining level of maternal immunology, introduction of complementary food (which may be contaminated with entero-pathogens) and the increasing of activity to the child or youth that lead to contact with human and/or animal feces (Farthing, *et al.*, 2012) (Brooks, *et al.*, 2003) (Omran, Yasin, 2001).

The present study revealed that the rate of infection in males was higher than that of females. The current result was in agreement with the study (Edward, 2000) which found that males are more prone to get infected with both pathogens. It is suggested that males were involved in outdoor as well as indoor activates such as fertilization, hauling, or other farming activates which may lead to infection (Edward, 2000) (Al-Rubai, 2001) (Mohammed, 1994).

Concerning residence, rate of infection with Amohiasis or *shigellosis* was more in rural areas than urban areas. Ali (2013) reached the same result which may attributed to contamination of food and drinking water with feces of rodents, dogs, cats and sheep which plays a role as reservoirs for these microorganism (Ali, 2013) (Edward, 2000).

The highest percentage of infection with *E. histoly*tica in comparison with *shigellosis* could be due to the fact that even *chlorination* of water cannot kill the Amoebic cyst as reported by several researchers (Milaat, 1995) (Henry, 1991).

Mixed stages of trophozoit and cyst, mostly distributed in stool samples, were examined for amoebiasis in Manathera. The results were in agreement with (WHO 2004) (Richardson, 2012) (Sehgal, 1996) .

Most researchers attributed the apparent mixed stages in the case of amoehiasis to the fact that trophozoite are responsible for acute cases which require urgent treatment while mixed stage are found in chronic cases which are responsible for recurrent diarrhea (Ali, 2013).

Bacillary dysentery remains one of the most important diarrheal disease affecting human particularly in resourced-poor nations. *Shigella sonnei* is the causative agent for the current bacillary dysentery and has replaced *S. Flexneri* as one of the most prevalent species globally (Yu, *et al.*, 1998). Contemporary epidemic S.sonnei strains mostly belong to lineage 11 exhibit multiple drug resistance due to the spread of transports and independent point mutation in the gyrase gene (Mirza, 2017). This is may be the reason why *s.sonni* was found more prevalent in stool samples in comparison with other species of *Shigella* bacteria.

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