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Research Article

Epidemiological study of intestinal protozoa at Wasit province

Dr. Abdulsadah A. Rahi[1] and Lara Majeed[1]

[1]Department of Biology, College of Science, Wasit University, Kut, Iraq

*Corresponding Author
Dr. Abdulsadah A. Rahi

Abstract: Intestinal parasitic and protozoan infections are amongst the most common infections world-wide particularly in developing countries. A microscopic examination of multiple feces samples of 200 persons who suffered from diarrhea was carried out in Al-Karamah Teaching hospital, Wasit province from November 2018 to February 2019. Two types of direct wet film preparation were done for each sample at the same time, 1st slide by using normal saline 0.9 % for detecting the motility of trophozoites and Lugol's iodine 5% slide for demonstrating structures and cyst. The 2nd slide by using modified ziehl neelson method. The present study revealed that the overall prevalence rate of intestinal protozoa was 115 (47.7%): *Entamoeba histolytica* 82(41%), *Cryptosporidium parvum* 25(12.5%) and *Giardia lamblia* 8 (4%). Prevalence was higher among families who live in rural areas 47(23.5%) than those in urban areas 35(17.5%) and in males 69(34.5%) more than females 46 (23%). The highest infection rate 50(25%) was recorded in age group (21-40) years old. The aim of present study was to determine the prevalence of intestinal protozoa in diarrheal patients at Wasit Province. We concluded our results that the prevalence rate of intestinal protozoa was found to be higher 115 (57.5%) at Wasit Province.

Keywords: Human, Feces, Direct smear, Modified Ziehl Neelson, Protozoa.

INTRODUCTION:

A parasite, by definition is an organism that to some degree injuries its host; however injury may be brought about in many ways. Intestinal parasitic and protozoan infections are amongst the most common infections world-wide (Markall*et al.,* 1992). Parasites that infest the gastro-intestinal tract are not only pathogenic but also result in the loss of a wide range of nutrients, and this predisposes to poor nutritional status in both children and adults (Kyu-Jae *et al.,* 2002).

Entamoeba histolytica infections occur mostly in adults, although they see in children. Since the parasite infects the large intestine, severe infection result in serious loss of blood and also may cause systemic problem such as liver abscesses due to infection of the liver by the parasites, amoebiasis can cause nutrient loss and can lower the levels of circulating proteins, this sometimes leads to under nutrition (Asfaw & Goitom 2000). The diagnosis of amoebiasis is often difficult and time consuming. Microscopic identification of trophozoites and cysts in the stool is the common method for diagnosing *E. histolytica* either in fresh stool or stool concentrates (Gatti *et al.,* 2002).

Infections with *Giardia lamblia* damages the intestinal mucosa and results in mal-absorption of nutrients, particularly fat. It seems to be commonly seen in children with under nutrition and results in impaired growth and weight loss in children (Babiker 2002). Common method to diagnose giardiasis is microscopic examination of fecal samples by visualizing the organism, either the trophozoites or the cysts, in unstained wet smears (Al-Saeed & Issa, 2010).

Cryptosporidium parvum affects the mucosal morphology and hence can cause mal-absorption of nutrients and under nutrition. Infected individuals shed the parasite in their feces in the form of oocysts as few as 5 days after initial infection and for approximately 5 weeks after the finish of diarrheal illness (Mahdi & Ali, 2004). Detection and identification of *C. parvum* oocysts in fecal specimens is done by modified Zeihl-Neelson method and Real-time PCR test (Abdulsadah *et al.,* 2016). The aim of present study was to determine

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the prevalence of intestinal protozoa in diarrheal patients at Wasit Province.

METERIALS AND METHODS:

In total, 200 fresh stool specimens of all age groups were tested at the parasitology laboratory of the Al-karamah Teaching Hospital in Kut city, during the period from November, 2018 to February, 2019. The stool samples were collected in clean and label plastic containers and examined within 24 h from the disposal of feces. Macroscopic examination of the samples was the first to determine the consistency. Second examination is microscopically by direct smear for presence of protozoan trophozoite and cyst stages. Two types of direct wet film preparation were done for each sample at the same time, 1st slide by using normal saline 0.9 % for detecting the motility of trophozoites and Lugol's iodine 5% slide for demonstrating structures and cyst. The 2nd slide by using modified ziehl neelson method for detecting of oocyst of *C. parvum* and *C. cayatenensis* (Ahsan-ul-Wadood, *et al.*, 2009).

Results:

Tables.1 Positive and negative intestinal protozoa infections

Number of feces samples	Positive (%)	Negative (%)
200	**115 (57.5%)**	**85(42.5%)**

Table.2 Distribution of positive cases in relation to the Age and Gender

Age group (year)	Male (%)	Female (%)	Total (%)
≥1 -20	25(12.5)	14(7.0)	39(19.5)
21-40	28(14.0)	22(11.0)	50(25.0)
31 and more	16(8.0)	10(5.0)	26(13.0)
Total (%)	**69(34.5%)**	**46(23%)**	**115 (57.5%)**

Table.3 Distribution of positive cases of *Entamoeba histolytica* in relation to the Age and District

Age group (year)	Positive (%)	Rural (%)	Urban (%)
≥1 -20	27(13.5)	19(9.5)	8(4.0)
21-40	38(19.0)	17(8.5)	21(10.5)
31 and more	17(8.5)	11(5.5)	6(3.0)
Total (%)	**82(41%)**	**47(23.5%)**	**35(17.5%)**

Table.4 Distribution of positive cases of *Cryptosporidium parvum* in relation to the Age and District

Age group (year)	Positive (%)	Rural (%)	Urban (%)
≥1 -20	10(5.0)	7(3.5)	3(1.5)
21-40	11(5.5)	7(3.5)	4(2.0)
31 and more	4(2.0)	2(1.0)	2(1.0)
Total (%)	**25(12.5%)**	**16(8 %)**	**9(4.5%)**

Table.5 Distribution of positive cases of *Giardia lamblia* in relation to the Age and District

Age group (year)	Positive (%)	Rural (%)	Urban (%)
≥1 -20	6(3.0)	3(1.5)	3(1.5)
21-40	1(0.5)	1(0.5)	0
31 and more	1(0.5)	1(0.5)	0
Total (%)	**8 (4%)**	**5(2.5 %)**	**3(1.5%)**

DISCUSSION:

Intestinal parasites are very common in developing countries. A total of 200 persons were suffered from diarrhea and abdominal pain was examined. Samples of feces were detected by microscopy. It revealed that the overall prevalence rate was 115 (47.7%): 69(34.5%) were males and 46(23%) were females. Our results indicated that the higher infection appeared in patients from rural areas 68 (59.1%) and in age group (21-40) years old recorded 50(25%) (Table 1, 2).

In developing countries, poor hygiene and the use of untreated human feces (i.e. fecal sludge) are important factors that contribute to the contamination of food and water. In such countries, prevention of infection with *E. histolytica*, *G. lamblia*, and *Cryptosporidium* spp. can be attained by improved community health education, sanitation, hygiene, and water treatment. To reduce enteric pathogens, including intestinal protozoa that may be present on fresh vegetables and fruits, the produce can be washed by clean tap water and soaked in a solution of acetic acid or vinegar for 10 to 15 minutes before consumption (Dhawan, 2008).

According to the results of the present study *E. histolytica* had an overall prevalence of 82(41%) (Table 3). These results in agreement with Ali *et al.*, (2003) that reported 15.6% prevalence of *E. histolytica* from preschool children in Bangladesh (Ali, *et al.*, 2003) Aza, *et al.*, (2003) reported 21.0% prevalence of intestinal parasites in seven villages of Malaysia. Kaur *et al.*, (2002) and Zahida *et al.*, (2010) recorded 11% prevalence of *E .histolytica* in children of Delhi, India and in Pakistan, respectively (Aza *et al.*, 2003; Zahida, *et al.*, 2010).

Modified acid-fast stain of a fecal smear has been the gold standard for detecting *Cryptosporidium* oocysts in stool. This method is commonly used in clinical microbiology laboratories to easily identify Cryptosporidial oocysts. Although the concentration and staining procedures are time-consuming and also require an experienced microscopist to read the slides, it is inexpensive and allows the detection of other parasites (eg, *Isospora* and *Cyclospora*) at the same time (Venczel *et al.*, 1997). Increased numbers of cases of *C. parvum* infection 25(12.5%) at Wasit province were associated with contaminated drinking water supplied to these population (Ldzi & Esbroeck, 2010).

Because the 50% infectious dose is relatively low for *C. parvum*, ranging from approximately 10 to 1,000 for healthy humans, oocysts could be transmitted through low levels of contaminated water or food, followed by person-to-person transmission, especially among household members.

Infection with *G. lamblia* was found to increase with age, reaching its highest in early age (Abahussain, 2005). Probably, indicating reduced parental personal, eating habit and activities linked with soil contaminated with infected fecal matters. The current study revealed that the prevalence of *G. lamblia* was 8 (4%), this result was agreed with Magda (2010) at Wasit Province (Majidah, 2010). Previous studies had attributed the high endemidicity of intestinal parasites due to poor environmental and personal hygiene, shortage of good water supply, and toilet habits (Abahussain, N.A. 2005).

CONCLUSIONS:

Our study revealed that the prevalence rate of intestinal protozoa was found to be higher 115 (57.5%) at Wasit Province. The most commonly infected 50 (25%) in age group (21-40) years old, male were infected more 69(34.5%) females in all areas.

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