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Prevalence of intestinal parasitic infection in patients at Wasit Province, Iraq

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Abstract---Intestinal parasites are the causative agents of number of important human infections in developing countries. The present study was aimed to determine the prevalence of protozoan and helminthes infections in diarrheal patients at Wasit province during the period from July, 2022 to September, 2022. A total of 120 stool samples from both gender and different age suffering from diarrheal, abdominal pain and fever. All stool samples were examined microscopically by the direct method for identification the trophozoite and cyst of protozoa and ova of helminthes. Only 55 samples were positive for intestinal parasite. The result showed that the percent of parasite infection among patients and control were 55 (45.83) % and 0(0%) respectively. The higher infection was recorded with *Entameba histolytica* was 30 (54.5%). The males infection were predominance 17(30.9%) than the females 13(23.63%). According the residence urban areas were reported12 (21.81%) and rural areas were 18(32.72%) infected with *Entameba histolytica*. The number and percent of co-infection with *Entamoeba histolytica* and *Blastocystis hominis* was 7(12.72%) and the male was 3(5.45%) while the female was 4(7. 27%). The infection of *Giardia lamblia* was 6(10.9%) and the males was 4(7.27%) while the females was 2(3.63%). According to *Blastocystis hominis* infection was reported 4(7.27%) and the male was 1(1.81%) while the female was 3(5.45%). The infection with *Cryptosporidium parvum* was 3(5.45%) and the male was 3(4.45%) while no infection appear in female. *Enterobious vermicularis* showed 4(7.27%) with 2 (3.63%) in both gender. At last Ascaris *lumbercoides* appear in 1(1.81%).

Keywords---intestinal parasite, Human, Microscope, Wasit, Iraq.

Introduction

Intestinal parasitic infections are endemic worldwide and remain as major public health problems in many tropical and subtropical countries (1). It is estimated that more than three billion people are infected with intestinal helminths and protozoa (2). Intestinal parasites are endemic in many developing areas and several factors affect the distribution and the prevalence of intestinal parasites(3). Personal hygiene, dietary habits, education level of the community, socio-economic status and climate are among the common factors that influence the prevalence of intestinal parasitic infections (4).

Entamoeba histolytica are considered to be among the most common and important causes of parasite-related diarrhea in human populations (5). *Entamoeba histolytica* is a pseudopod-forming non-flagellated protozoan parasite that causes proteolysis and tissue lysis (6). Motility of *Giardia* by the mean of flagella considers a virulence factor of this parasite (7). In Iraq, gastro-intestinal parasitic infections are the leading causes of mortality and morbidity causing a series of public health issues such as malnutrition, anemia, and growth retardation (8-10).The causes of diarrhea can be directly transmitted either through the fecal–oral route, tap water, food contaminated with diarrhea, or indirectly transmitted by some vectors (11) . Intervention is required to prevent diarrhea which includes providing safe drinking water, use of improved sanitations, and hand washing with soap. Diarrhea can also be treated with oral rehydration solution (ORS) or a solution of clean water, sugar, and salt (12).

Materials and Methods

Stool specimens collection

A total of 120 stool samples were obtained randomly in patients who suffering from diarrhea in Al karamah Teaching Hospital at Wasit province from July, 2022 to September, 2022 . Before analyzing the fecal samples the special questionnaire form was prepared to denote full information from each patient which was relevant to various epidemiological factors that might be responsible for parasite infection which included patient name, age, gender, region. The stool samples were collected in clean universal screw cap bottles from patients; it placed in dry plastic container and transported to the laboratory for microscopically examination.

Identification of Intestinal parasite in collected sample:

Fecal samples were collected from diarrheal patients in clean screw capped tubes. Socio-demographic data were collected simultaneously with sample collection such as gender, age, and residence area. Outside hospital collected samples were transported to the laboratory within two hours for immediate microscopic examination. After collection, the stool samples placed in dry plastic container and transported to the laboratory for microscopically examination (13). Small portion of each stool sample mixed with a drop of 0.9% normal saline (NaCl) or a drop of Lugol's iodine on a glass slides making a wet smear were examined microscopically using (10 X and 40 X) objectives, for cyst, trophozoite and ova of

helminthes detection (14). Modified Ziehl- Neelsen was used on thin fecal smears for coccidian protozoa oocyst detection by 100 X oil immersion (15).

Results and Discussion

By the examination of 120 stool sample of outpatients in Al-Karamah Teaching hospital at Wasit province. The results appeared that 55(45.8%) of feces samples were positive for intestinal parasite among diarrheal cases that examined by microscope using direct method and 0.0% among control group.

Table 1
Result of infection with intestinal parasite according to the residence

parasite	No (%)	Rural	Urban	Total
E.histolytica	30(54.5%)	18(32.63%)	12(21.81%)	30(54.5%)
Co-infection	7(12.72)	5(9.09%)	2(3.63%)	7(12.72%)
G. lamblia	6(10.9%)	3(5.45%)	3(5.45%)	6(10.9%)
B. homins	4(7.27%)	3(5.45%)	1(1.81%)	4(7.27%)
C. parvum	3(5.45%)	2(3.63%)	1(1.81%)	3(5.45%)
E. vermicularis	4(7.27%)	3(5.45%)	1(1.81%)	4(7.27%)
A.lumbricoides	1(1.81%)	1(1.81%)	0(0%)	1(1.81%)

The overall infection rate by intestinal protozoa was significantly higher than intestinal helminthes infection. Out of the total subjects investigated, *E. histolytica* was the most prevalent intestinal protozoan infection, whereas *E. vermicularis* the most prevalent intestinal helminthes infection. This finding was similar to that reported by (16), who found that 29.4% and 2.7% of Sudanese food-handlers were infected by intestinal protozoa and helminths, respectively. The present study recorded that the highest number of parasitic infection in rural area rather than urban area, this result has an agreement with (17),who were foundthe highest infected patients in rural area and lowest infected patients found in urban area, but disagreement with (18),who was discovered that prevalence of infection in urban and rural children was similar. Also it has an agreement with another study in Thi-Qar who showed the infected patients with amoebiasis resided in rural areas, whereas decrease in urban areas (19).

Table 2
Disstribution of intestinal parasite infection according to the gender

Intestinal parasite	Infection in male	Infection in female	Total
E.histolytica	17(30.9%)	13(23.63%)	30(54.5%)
Co-infection	3(5.45%)	4(7.27%)	7(12.72%)
G.lamblia	4(7.27%)	2(3.63%)	6(10.9%)
B.hominis	1(1.81%)	3(5.45%)	4(7.27%)
C.parvum	3(5.45%)	0(0%0	3(5.45%)
E.vermicularis	2(3.63%)	2(3.63%)	4(7.27%)
A .lumbricoides	0(0%)	1(1.81%)	1(1.81%)

The table (2) showed the higher rates of infection in male than in female with parasites like *Entamoeba histolytica*, *Giardia lamblia*, *Enterobius vermicularis* were recorded by some researchers (28) and (29). On other hands, researchers (20), (30), (31) were recorded higher infection rate with intestinal parasites in female than male, and many studies observed an increase in the prevalence of intestinal parasitic infection among the males (23) and others found an equality between both genders (21,22,23).

Table 3
Distribution of intestinal parasite according age groups

Parasite/ Age	1-15 years	16-30 years	31-45 years	46-60 years	61-75 years	Total
E .histolytica	12(21.81%)	4(7.27%)	5(9.09%)	4(7.27%)	5(9.09%)	30(54.5%)
Co-infection	4(7.27%)	/	1(1.81)	1(1.81%))	1(1.81)	7(12.72%)
G.lamblia	1(1.81%)	1(1.81%)	3(6%)	/1(1.81%)	/	6(10.9%)
B.hominis	2(3.63%)	/	1(1.81%)	/	1(1.81)	4(7.27%)
C.parvum	2(3.63%)	/	/	1(1.81%)	/	3(5.45%)
E.vermicularis	3(5.45%)	/	1(1.81%)	/	/	4(7.27%)
A.lumbricoides	1(1.81%)	/	/	/	/	1(1.81%)

The result of the present study revealed that the most affected group of patients with intestinal parasites in age group (1-15) years old, otherwise the age group (16-30) years old was the less affected group. Our results revealed that intestinal infections were more prevalent in adults in comparison with other age groups. The findings of our study disagreed with (24) in Riyadh/ Saudi Arabia. While in Sana'a city/ Yemen (25), in Samarra city/Iraq (26) and (27) in Ad-Dawadimi/ Saudi Arabia, and most of studies worldwide at the point that adults are the most infected with intestinal parasite. This difference in our findings could be due to the high adult attendance to the hospital in comparison with children and adolescents during the study period.

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