PARASITOLOGICAL STUDIES AMONG EGYPTIAN PATIENTS ATTENDED
DIAGNOSTIC & RESEARCH UNIT OF PARASITIC DISEASES, KASR
AL-AINY TEACHING HOSPITALS: A FIVE-YEAR RETROSPECTIVE STUDY

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Abstract
This is a retrospective study on recorded parasitic infections for in- and outpatients attended Di-
agnostic & Research Unit of Parasitology, Medical Parasitology Department, Kasr Al-Ainy
Teaching Hospitals from 2017 to 2021. A total of 10557 samples were examined for parasites,
Helicobacter pylori antigen detection and occult blood in stool.

Stool samples (21%) were infected with 15 species of intestinal parasites. These were Blastocy-
stis hominis (13%), Giardia lamblia (3%), Entamoeba histolytica (3%), Entamoeba coli (1%),
mixed infections (1.6%), H. pylori co-infection (2%), and occult blood with parasites (0.3%).
Male to female infection ratio was 50.3% to 49.7%. The highest prevalence season of infection
was autumn (31.5%). But, all these results were statistically non-significant (p>0.05).

Keywords: Greater Cairo, Outpatients, Prevalence, Parasites, H. pylori, occult blood.

Introduction
Parasitic infections especially intestinal protozoa are more or less neglected tropical dis-
seases constitute a global health problem (Taghipour et al, 2021), especially among children
in developing countries (Harhay et al, 2010). Prevalence of infections was governed by ge-
ographic, ecology, socioeconomic factors, and limited access to clean water, poor general sa-
nitation, as well as family size and low income (Amer et al, 2018). Ingestion of contamin-
ated food and water is the commonest infection route of different intestinal parasites, and
also by skin penetration by infective larvae in polluted water or soil (Moses et al, 2013).

Despite the marked improvement in sanitation infrastructure and hygienic status, intesti-
nal parasites still a significant Egyptian Health Challenge (Monib et al, 2016). Moreover,
co-infection with Heliobacter pylori is common with intestinal parasitic infections as they
share the same modes of infection and the same environmental conditions (Abd El Hame-
ed et al, 2021), also the urease production by H. pylori facilitates crossing the stomach’s
acidic environment by the intestinal parasites (David et al, 2006). For the development of
good preventive and control measures, epidemiological studies are important to have base-
line data on the occurrence of parasitosis.

The study aimed to clarify the prevalence of parasites and co-infections from 2017 to 2021
among patients attended Kasr Al-Ainy Teaching Hospitals, Egypt from their records of the
Diagnostic and Research Unit of Parasitic Diseases.

Materials and Methods
The present study is a retrospective analysis of 10557 samples from Diagnostic & Resea-
rch Unit of Parasitology (DRUP) at Medical Parasitology Department, Kasr Al-Ainy Teac-
ching Hospitals from 2017 to 2021 for parasites with or without H. pylori co-infection. Da-
ta collection was done by interpreting the inter-shift sheets of the DRUP over five years.

Stool samples of patients attended the DRUP were collected in sterile labeled plastic con-
tainers, and examined macroscopically for enterobiasis, gravid segments as the likes and mi-
scopically using stained direct smear and concentration methods (Dyab et al, 2016).

Part of stool specimen was spread on a clean
were helminthes (1%). The commonest parasites prevalence of protozoa (20%) was higher than were identified in stool analysis.

Eight intestinal helminthes and an arthropod intestinal parasites; six species of protozoa, 933 (21%) were infected with 15 species of both males and females. Drop in patients’ number in year 2020 (12.2%) due to Corona Quarantine, but higher number in 2019 (25.7%) was just before Corona Pandemic. Details were given in tables (1 & 2) and figures (1 & 2).

**Results**

Out 10557 patients, 4916 (46.6%) were males and 5641 (53.4%) were females. Drop in patients’ number in year 2020 (12.2%) due to Corona Quarantine, but higher number in 2019 (25.7%) was just before Corona Pandemic. Details were given in tables (1 & 2) and figures (1 & 2).

**Discussion**

In the present study, out of 4362 stool samples examined during the study (2017-2021), 933 (21%) were infected with 15 species of intestinal parasites; six species of protozoa, eight intestinal helminthes and an arthropod were identified in stool analysis. Overall, the prevalence of protozoa (20%) was higher than helminthes (1%). The commonest parasites were *B. hominis* (13%), *E. histolytica* (3%), *E. coli* (1%), *G. lamblia* (3%), but others were *C. parvum* (n=20), *H. nana* (n=12), mite eggs (n=8) *A. duodenale* (n=6), *I. belli* (n=4), *A. lumbricoides* (n=4), *C. philippinensis* (n=3), *S. mansoni* (n=2), *Fasciola* species (n=2), *Taenia* segments (n=1) and *S. stercoralis* (n=1). The parasites rates were low in females (49.3%) than in males (50.7%), but without significant difference (P>0.05). *B. hominis* showed highest protozoan rate among sexes.
(63% in females & 61% in males), and also H. nana showed highest helminthic rate (1% in females & 2% in males). El Shazly et al. (2006) in Dakahlia Governorate reported helminth in a descending were: S. mansoni (5.3%), Fasciola sp. (4.8%), H. heterophyes (4.2%), Hymenolepis nana (3.9%), Trichostrongylus sp. (2.6%), A. lumbricoides (1.8%), S. stercoralis (1.5%), H. diminuta (1.4%), T. saginata (1.1%), E. vermicularis (1.1%), T. trichura (0.7%), and A. duoden- ale (0.1%), but protozoa were B. hominis (22.4%), G. lamblia (19.6%), E. histolytica/dispar (19%), I. butschlii (16%), C. parvum (14.3%), E. coli (9.7%), I. hominis (7.7%), E. nana (6.9%), T. hominis (4.2%), Cy. cayetanensis (4.2%), Microsporidia spores (3.2%), Enteromonas hominis (1.9%) and Embadomonas intestinalis (1.3%).

In the present study, parasites were more or less similar seasonally, without significant differences (P>0.05). But, the highest infection rate was 31% in autumn, followed by 24% winter, 23% spring, and 22% summer. Mixed parasitic infection was 1.6%, parasites co-infection with H. pylori was 2%, and fecal occult blood was 0.3%. Generally, parasites are the worldwide commonest cause of illness, and critical threats due to morbid nature (Hailu and Ayele, 2021). So, knowing the parasites distribution paved the way for feasible control programs (McCarthy et al, 2012). Reports on prevalence rates of parasites vary in different localities in Egypt. In Cairo region, about 51% of the patients complaining of gastrointestinal symptoms were positive for different intestinal parasitic infections (Hussein et al, 2017). These parasites are transmitted by fecal-oral pathway, either directly from person to person or indirectly via consumption of contaminated food and water, but asymptomatic diseases carriers provide a risk of community transmission (Aly and Mostafa 2010).

In the present study, 21% of the examined stool samples were positive for different intestinal parasitic infections. This prevalence was similar to that reported in Egypt. The prevalence among school children in El-Minia Governorate was 29.3% (Ibrahim, 2011). While higher prevalence rates of 41.9 % and 69.3% were detected in Assuit Governorate (Kotb et al, 2011).

In the present study, prevalence of protozoa infection (20%) was higher than that of helminthes ones (1%). Higher prevalence rates of protozoan infection were reported in Egypt (El Shazly et al, 2007; Ibrahim, 2011; Kotb et al, 2011; Mohammad et al, 2012; El-Bahnasawy et al, 2018). The high prevalence of protozoan infection in this study suggested contamination of drinking water (Bhat et al, 2013).

The rate of mixed double infections was 1.6%, which was much lower than previous reports from Egypt (El-Masry et al, 2007; Bauomy et al, 2010; Kotb et al, 2011). In terms of the detected intestinal parasites; Blastocystis hominis had the highest infection rate (13%), followed by Giardia intestinalis (3%), E. histolytica/dispar (3%) while Hymenolepis nana had the highest infection among helminthes (table 2).

Blastocystis was the most frequently rintestinal parasite with a high prevalence worldwide (Eassa et al, 2016; Rebolla et al, 2016). This agreed with El Deeb and Khodeer (2013) who reported the prevalence of Blastocystis spp. 34.5% in iron deficiency anemic and non-anemic individuals in Menoufia Governorate. Also, El-Badry et al. (2018) who reported prevalence of 19.1% in patients attended Beni-Suef University Hospitals. But, high Blastocystis prevalence rates were reported among children in Alexandria (67.4%) and Gharbia (53%) governorates respectively (Eassa et al, 2016; El-Marhoumy et al, 2015)

In the current study, the prevalence of H. pylori co-infection with parasites was 2%. But, abroad the focus on co-incidence of H. pylori and protozoa (especially Giardia) was more emphasized than helminths (Júlio et al,
Both *H. pylori* and gastrointestinal parasites share the same estimated risk factors; including poor sanitation and hygiene, low socioeconomic conditions and overcrowded populations (Cheng *et al.*, 2009). This agreed with Kibru *et al.* (2014) in Ethiopia reported that intestinal parasites were significantly associated with *H. pylori* infection. The co-infections may be due to same transmission routes; contaminated food and water (Seid *et al.*, 2018). However, Schmid *et al.* (2021) in Switzerland reported that protozoan *G. lamblia* (GL) and the bacterium *H. pylori* (HP) are common causes of gastrointestinal disease.

In the present study, prevalence of fecal occult blood with intestinal parasite was 0.3%. This was detected as cause dysentery or blood losses with *Schistosoma mansoni* *Trichuris trichiura*, *Ancylostoma duodenale*, and *E. histolytica*. But, Okamoto *et al.* (2005) in Japan found that the 4 asymptomatic cases with positive fecal occult blood (FOB) test and amebic colitis indicated *E. histolytica* infection.

In the present study, males had a higher prevalence of intestinal parasites (50.7%) than females (49.3%), but without significant difference (*p* > 0.05). Bauomy *et al.* (2010) Kotb *et al.* (2011) in Assuit Governatorate found higher rates among males than females (54.9% & 45.1% and 60% & 40% respectively). Also, Ibrahim (2011) in Minia Governatorate reported higher prevalences among males than females. El-Sherbini and Abosdera (2013) in Giza Governatorate recorded higher infection rates of intestinal parasites among male children. Haile and Ayele (2021) in Debre Berhan, Ethiopia reported more parasites among male school children.

In the present study, highest rates of infection were during fall months (31%) and the lowest ones were in summer (22%). This agreed with Amer *et al.* (2018) in Riyadh, Saudi Arabia who found relationship between seasonality and intestinal parasitic infections, with the highest in autumn. However, Eraky *et al.* (2014) in Benha City found that the high risk of acquiring parasitic infection was in summer due to consumption of raw vegetables, and fruits. Ismail *et al.* (2016) reported that giardiasis was detected all the year around with a peak in mid-summer and late winter.

In the present study, showed seasonal variation in prevalence of intestinal parasites, but without statistical significance (*p* >0.05). This agreed with Akinbo *et al.* (2011), who reported that intestinal parasitism was not seasonally significant.

**Conclusion**

Parasites are still a public health problem in Greater Cairo that must be in concern with the Public Health Authorities using appropriate statistical data to develop effective prevention and control strategies. No doubt, intestinal parasites are one of the health problems in children and immuno-compromised patients.

The high prevalence of intestinal protozoa was among patients were *Blastocystis hominis*, *Entamoeba histolytica* and *Giardia lamblia*, which are of health concern as transmitted via feco-oral routes. Improving sanitation, safe water supplies, and educating people on personal and environmental hygiene are indicated to control parasites and *H. pylori*.

**References**


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Explanation of figures

Fig. 1: Total patients (males & females) attended DRUP from (2017-2021).

Fig. 2: Distribution of intestinal parasitic infection during different seasons of study.