

A study of Intestinal helminthic parasitic infection in Qena governorate inhabitants

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Background: Parasitic diseases continue to be a major cause of morbidity and mortality. More than three billion people are infected worldwide, mainly in the developing countries. Children are easy prey to parasites. Poverty, illiteracy, poor hygiene, lack of access to potable water, poor public health infrastructure, hot and humid tropical climate are the usual factors associated with intestinal parasitic infections. Parasitic infections, particularly intestinal helminthes, cause hundreds of thousands of avoidable deaths each year

Objective: To Assessment of the prevalence of parasitic helminthes infection among Qena governorate residents.

Patients and method(s): Across sectional study was carried out on 316 patients, 5-50 years attended the outpatient clinics of Qena Faculty of Medicine, South Valley University, between August 2017 and August 2018. Stool samples were collected and examined by Direct wet mount and Concentration techniques including sedimentation using saline and formol ethyl acetate.

Result(s): In the studied cases, intestinal helminthic parasitic infections were found in 40 (12.5%) cases out of 316 patients. Positive cases were 30 male patients (75%), while 10 female patients (25%), 27 (67.5%) patient out of 197 aged from 5-19 years, 0 (0%) patients out of 70 from 20-34 years and 13 (32.5%) out of 49 patient from 35-50 years, 10 of patients from urban houses (25%) and 30 of patients from rural houses (75 %), 19 (47.5%) were present with abdominal pain , 9 (22.5%) with diarrhea and 12 (30%) with perianal itching

Conclusion: Qena governorate suffer from intestinal helminthic parasitic infection mainly in rural areas in children and young adults from 5-19 years old.

Keywords: intestinal helminthes, Qena governorate, prevalence

Introduction

Parasitic diseases continue to be a major cause of morbidity and mortality. More than three billion people are infected worldwide, mainly in the developing countries. Children are easy prey to parasites. Poverty, illiteracy, poor hygiene, lack of access to potable water, poor public health infrastructure, hot and humid tropical climate are the usual factors associated with intestinal parasitic infections (Evering and Weiss 2006). Approximately 300 million people with heavy helminth infections suffer from severe morbidity that results in more than 150,000 deaths annually (Bethony et al., 2006)

The greatest numbers of soil-transmitted helminths infections occur in tropical and subtropical regions of Asia, especially China,

Saharan Africa. Of the 1-2 billion soil-transmitted helminths infections worldwide, approximately 300 million infections result in severe morbidity, which are associated with the heaviest worm burdens (Hotez et al., 2003)

Infections with intestinal helminths are among the most common intestinal infections of humans. They occur worldwide and are most prevalent in the poorest communities of the developing world (Bundy, 1994)

In Egypt, intestinal parasitic infection in children is a common public health problem; in all governorates it was identified among infants, preschool and school children (Ibrahim, 2011). Though the reported prevalence rates indifferent parts of Egypt vary considerably from one study

to another ranging from 27% to 56% of the children are suffering from intestinal parasites (Mansour et al., 2013). In addition 47.0% of children are worryingly suffering from intestinal parasites and anemia (UNICEF, 2000).

Age and sex-related behavioral habits, eating habits, socioeconomic status as well as inadequate access to sanitation, to clean water and personal hygiene are the commonest risk factors cited for intestinal parasitic infections (Hotez et al., 2014). Children are at highest risk of infection and carry the highest disease burden (Tchuente 2011). About 400 million school-age children around the world are infected with roundworm, whipworm and hookworm (Lang, 2005)

An estimated 4.5 billion individuals are at risk of STHs and as many as 1.4 billion individuals might be infected with *A. Lumbricoides*, close to 1.05 billion with *T. Trichiura*, and more than 1.3 billion with hookworms (Keiser; Utzinger, 2008) (WHO, 2002)

The greatest numbers of soil-transmitted helminths infections occur in tropical and subtropical regions of Asia, especially China, India and Southeast Asia, as well as sub-Saharan Africa (Hotez et al., 2003)

In Egypt, intestinal parasitic infection in children is a common public health problem; in all governorates it was identified among infants, preschool and school children (Ibrahim, 2011). Though the reported prevalence rates in different parts of Egypt vary considerably from one study to another ranging from 27% to 56% of the children are suffering from intestinal parasites (Mansour et al., 2013). In addition 47.0% of children are worryingly suffering from intestinal parasites and anemia (UNICEF, 2000). The aim of this study is to assess the prevalence of parasitic helminth infection among Qena governorate residents.

Subjects and Methods:

A cross-sectional study was carried out on 316 patients, 5-50 years attended the outpatient clinics of Qena Faculty of Medicine, South

Valley University, between August 2017 and August 2018.

In the present study, after obtaining an informed written consent, 316 stool samples were collected from patients attending outpatient clinics in Qena university Hospital South Valley University

Patients subjected to the study show symptoms suggestive of parasitic infections such as abdominal colic, diarrhea, constipation, anal itching, organomegaly or jaundice.

Patients were asked to bring 3 consecutive stool samples to be examined for possible parasitic helminth finding. Specimens were examined within one hour of collection after detailed history from children: age, sex, residence, complaint (diarrhea, abdominal pain, anorexia, nausea, vomiting and anal itching) by the following methods:

Direct smear method:

Mixing a small amount of stool (about 2 mg) with a drop of 0.85% NaCl (Garcia 2007): these are used for identification of eggs or larvae for Helminths

Concentration technique:

Simple sedimentation with 0.85% NaCl and Formol- Ether Sedimentation technique: (Garcia 2007) to increase the efficacy of centrifugal sedimentation for recovery and concentration of helminth eggs from faeces.

Statistical analysis

Data were organized, tabulated, and statistically analyzed using SPSS version, 20.0. For quantitative data, mean and standard deviation were calculated. Chi-square test (χ^2) was used to compare the frequency data.

Results:

In the present study Intestinal helminth parasitic infections were found in 40 (12.5%) cases out of 316 patients as illustrated in **Table (1) and Figure (1)**

Table (1): illustrate prevalence of negative and positive cases in the study group of patients.

| | Frequency | Percent |
|----------------|-----------|---------|
| Negative cases | 276 | 87.5 |
| Positive cases | 40 | 12.5 |
| Total | 316 | 100.0 |

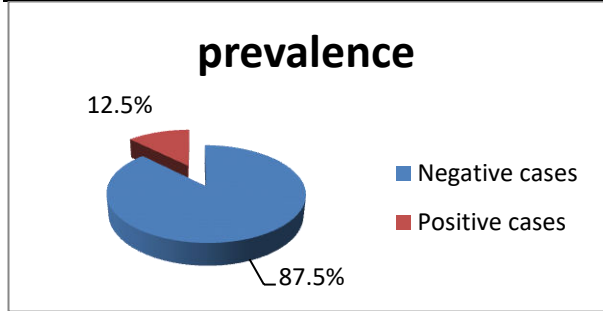


Figure (1) illustrate prevalence of negative and positive cases in the study group of patients

Positive cases were 30 male patients (75 %), while 10 female patients (25%), 27 (67.5%) patient out of 197 aged from 5-19 years, 0 (0%) patients out of 70 from 20-34 years and 13 (32.5%) out of 49 patient from 35-50 years, 10 of patients from urban houses (25%) and 30 of patients from rural houses (75 %), 19 (47.5%) were present with abdominal pain , 9 (22.5%) with diarrhea and 12 (30%) with perianal itching as illustrated in **Table (2)**

Table 2: Show socio-demographic risk factors and different clinical presentation of parasitic infection.

| Characteristics | Positive cases (40) | Percentage (%) |
|-----------------|---------------------|----------------|
| Age | | |
| 5-19 | 27 | 67.5% |
| 20-34 | 0 | 0% |
| 35-50 | 13 | 32.5% |
| Gender | | |
| Male | 30 | 75% |
| Female | 10 | 25% |
| Residence | | |
| Rural | 30 | 75% |

| | | |
|------------------|----|-------|
| Urban | 10 | 25% |
| Abdominal pain | | |
| Yes | 19 | 47.5% |
| No | 21 | 52.5% |
| Diarrhea | | |
| Yes | 9 | 22.5% |
| No | 31 | 77.5% |
| Perianal itching | | |
| Yes | 12 | 30% |
| No | 28 | 70% |

In the present study 30 male patients were infected with intestinal helminthic infections with percentage 75%, while 10 female patients were infected with intestinal helminthic infections with percentage 25%. Thus, gender was considered to be a risk factor for acquiring intestinal helminthic infections. (P value= 0.02 which is a significant value). According to **Table (3)** and **Figure (2)**

Table (3): Relationship between gender and prevalence of intestinal helminthic infections in cases

| Gender | group | | Total | P value |
|--------|-----------------------|----------------|--------|---------|
| | Negative cases | Positive cases | | |
| Female | Count 117 | 10 | 127 | 0.02 |
| | % within group 42.4% | 25% | 40.2% | |
| Male | Count 159 | 30 | 189 | 0.02 |
| | % within group 57.6% | 75% | 59.8% | |
| Total | Count 276 | 40 | 316 | |
| | % within group 100.0% | 100.0% | 100.0% | |

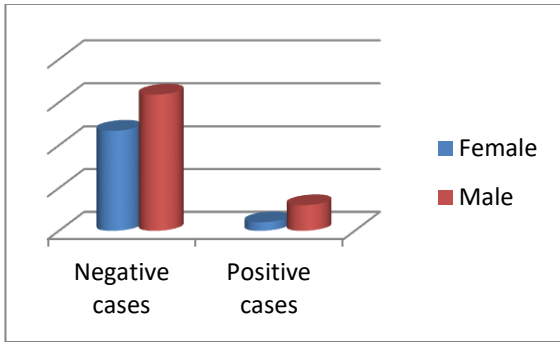


Figure (2): Relationship between gender and prevalence of intestinal helminthic infections in cases

the intestinal helminthic parasitic infection in positive cases were in 27 (67.5%) patient out of 197 aged from 5-19 years, 0 (0%) patients out of 70 from 20-34 years and 13 (32.5%) out of 49 patient from 35-50 years (p value = 0.001). According to **Table(4)** and **Fig.(3)**,

Table(4):Distribution of positive and negative cases according to their age

| Age group | Number of tested patients & % | | Number of Positive cases & % | | Number of Negative cases & % | | P value |
|-----------|-------------------------------|-------|------------------------------|-------|------------------------------|-------|---------|
| | Number | % | Number | % | Number | % | |
| 5-19 | 197 | 62.3% | 27 | 67.5% | 170 | 61.5% | 0.000 |
| 20-34 | 70 | 22.1% | 0 | 0% | 70 | 25.4% | |
| 35-50 | 49 | 15.5% | 13 | 32.5% | 36 | 13.1% | |
| Total | 316 | 100% | 40 | 100% | 276 | 100% | |

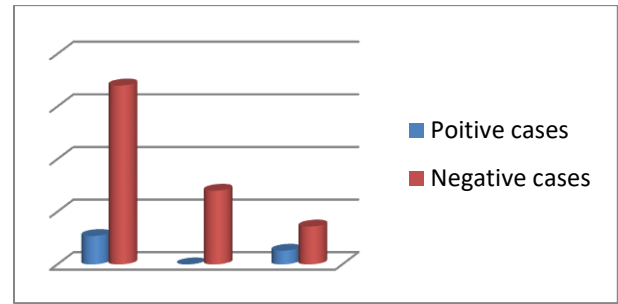


Figure (3):Distribution of positive and negative cases according to their age

intestinal helminthic parasitic infection were detected in 10 of patients from urban houses (25%) and 30 of patients from rural houses (75%). p value = 0.002 According to **table (5)** and **figure (4)**

Table(5): Relationship between residence and prevalence of intestinal helminthic infections in cases

| Residence | group | | Total | P value |
|----------------------------|----------------|----------------|---------------|---------|
| | Negative cases | Positive cases | | |
| Rural Count % within group | 137 49.6% | 30 75% | 167 52.8% | .002 |
| Urban Count % within group | 139 50.4% | 10 25% | 149 47.2% | |
| Total Count % within group | 276 100.0% | 40 100.0% | 316 100.0% | |

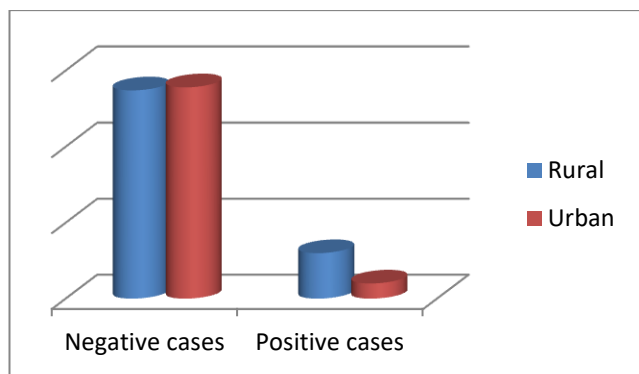


Figure (4): Relationship between residence and prevalence of intestinal helminthic infections in cases

In the present study 19 (47.5%) patients of the cases were present with abdominal pain, 9 (22.5%) were present with diarrhea and 12 (30%) were present with perianal itching. P value 0.001 According to **table (6) and figure (5)**

Table (6): Distribution of intestinal helminthic parasitic infection in patients according to Clinical picture.

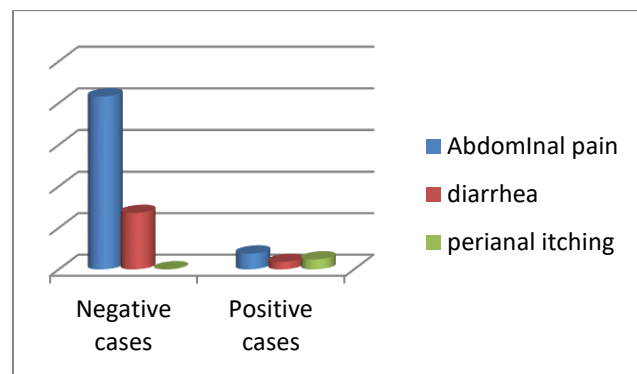


Figure (5): Distribution of intestinal helminthic parasitic infection in patients according to Clinical picture.

Examination of the collected stool samples of the studied population, the results show 12.5% of overall had intestinal helminthic parasitic infection. The commonest detected parasite were asfollowing: Hymenolepis nana egg (4.7 %), Enterobius vermicularis egg (2.5 %), Enterobius vermicularis egg and adult (0.9 %), Taeniasaginata egg (2.8 %) and Ancylostomaduodenale egg (0.9%). As illustrated in **Table (7) and Figure (6)**

Table (7): showed the prevalence of different intestinal helminthic parasites in the study group

| Clinical picture | group | | Total | P value |
|------------------|------------------------|-----------------------|---------------|---------|
| | Negative cases | Positive cases | | |
| Abdominal pain | Count 208 75.4% | Count 19 47.5% | 228 72.2% | .000 |
| Diarrhea | Count 68 24.6% | Count 9 22.5% | 77 24.4% | |
| Perianal itching | Count 0 0.0% | Count 12 30% | 11 3.5% | |
| Total | Count 276 100.0% | Count 40 100.0% | 316 100.0% | |

| Parasite | Frequency | Percentage |
|---|-----------|------------|
| 1-Ancylostoma duodenale eggs | 3 | 0.9% |
| 2-Enterobius vermicularis egg | 9 | 2.8% |
| 3-Enterobius vermicularis egg and adult | 4 | 1.2% |
| 4-Hymenolepis nana egg | 15 | 4.7% |
| 5-Taenia saginata eggs | 9 | 2.8% |
| 6-Negative cases | 276 | 87.5% |
| Total | 316 | 100.0% |

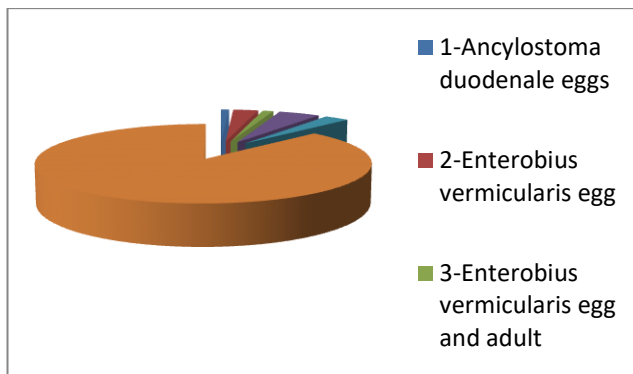


Figure (6): showed the prevalence of different intestinal helminthic parasites in the study group

Discussion:

Parasitic diseases continue to be a major cause of morbidity and mortality. More than three billion people are infected worldwide, mainly in the developing countries. Children are easy prey to parasites. Poverty, illiteracy, poor hygiene, lack of access to potable water, poor public health infrastructure, hot and humid tropical climate are the usual factors associated with intestinal parasitic infections (Evering and Weiss 2006).

Parasitic infections, particularly intestinal helminthes, cause hundreds of thousands of avoidable deaths each year. Intestinal helminthes are more prevalent throughout the tropics, especially among poor communities. Records show increasing trends in helminthiasis infections, particularly in developing nations (Bdiret al., 2010).

The present study was done on 316 patients from Qena Governorate Hospitals from outpatients, Intestinal helminthic parasitic infections were found in 40 (12.5%) cases out of 316 patients.

The prevalence was nearly similar to the study by (Hussein et al., 2017) who found Out of 100 patients, among patients with gastrointestinal tract disorders from the Greater Cairo region the prevalence of parasitic infection was 11.7%

And The study by (Abd El Mageed et al., 2010) conducted in 1920 School Aged Children attending Pediatric Department of Al-Azhar and Assiut University Hospitals, their ages ranged from 6 to 16 years .The percentage of parasitic infections was 16.5%.

Also in the study done by Samehet al., 2013, the study included 1000 young adult men, attending for medical advice for different gastrointestinal symptoms in Qena University Hospital the results of stool analysis of the studied population, 9.5% had intestinal helminthic parasitic infection. the prevalence is nearly similar as both studies were conducted at same region, Qena governorate

In another study, Henin, (2008) studied the prevalence of parasitic infections among children in Abu El-Reesh Hospital in Cairo and reported that the rate was 64 % out of 860 children

Also Abdel-Rahman, (2003) recorded a rate of 66.3 % among school children in a village in west of Alexandria out of 569 cases.

In the study by Farghly et al., 2016, the prevalence of parasitic infections among school children in Zagazig district was (21.07 %) out of 859 children. The prevalence in this study was relatively high due to bad hygienic measures, reduced health education, warm climate, humid atmosphere, consumption of large quantities of raw vegetables without washing, direct contamination of food and drink by infective flies, lack of central sewage disposable system and home septic tanks, poor water supply and deficiency of primary health care centers

In the study by (Osama AbdElla et al., 2015) done on 798 patients their age from 2 -65 years old attended to Qena University Hospital, 359 (44.98 %) were positive for gastrointestinal helminthic infection. These differences may be because the wide variation in the sample sizes between their study (798 cases) and ours (316 cases)

In comparison to a study done In Ethiopia conducted between March 29 and April 9, 2010 to determine the prevalence and intensity of soil transmitted helminths among elementary school

children, Of the total 715 stool specimens examined, 326 were positive for at least one intestinal parasite making the prevalence 45.6% (Tefera et al., 2017)

Also Panda et al., 2012 reported that (55.6 %) of school children were found to be positive for intestinal parasites in Vizianagaram district in India, while Kassem et al., 2007 reported a rate of 56 % among children in Libya.

Conclusion:

Qena governorate suffer from intestinal helminthic parasitic infection mainly in rural areas in children and young adults from 5-19 years old

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