Prevalence of intestinal parasitosisamong male youth in QenaGovernorate (Upper Egypt), and its relation to socio-demographic characteristics and some morbidities

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Abstract: Background: Despite of the continuing improvement in the economic status, standard of living, sanitation and ecology of the Egyptian society, yet parasitic infections continue to be among the most common and persistent public health problems. **Methods:** A group of1000adult males aged from18 to 25 years attended to Qena University Hospital for different gastrointestinal symptoms with or without anemia during a time period of a year (2011-2012) were enrolled in this study. **Laboratory investigations including:** complete blood countand stool analyses.Stool samples were examined by direct fecal smear and formal-ether sedimentation techniques to detect parasitic infestations among the studied groups. **RESULTS:**The present study included 1000young adult men, 44.4% of overall had parasitic infection. Young people living in rural areas had a marked significant association with parasitic infection than those living in urban areas (P<0.001). The commonest detected parasite were as following: Entamoebahistolytica (18.4%), Blastocystishominis (11.2%), Gardialambilia (8.2%), Enterobiusvermicularis(8%), Hymenolepis nana (6%), Ascarislumbricoides (5.8%), Taeniasaginata (4.4%), Entamoebacoli (4.2%), Cryptosporidium parvum (3.2%), Isosporahominis (2.2%), Endolimax nana (2%), Dientamoebafragili (2%), Iodamoebabutschlii (1.4%), Trichocephalustrichiuris (0.8%), Fasciola (0.2%), Heterophyesheterophyes (0.1%), and a larva (maggot) of house fly (0.1%). According to blood analysis; anemia was present in 9.8% of studied young adults, esinophilia in 13.8%. It was obvious that there was a significant association between parasitic infection from one side and each of anemia and eosinophilia from the other side (P<0.0001). Parasitic infection was present among 62.3% of those with low social class as compared to only 16.7% of those of high social class with a statistically significant difference (P<0.0001). **Conclusion:** Rural residency and low social class were the most significant risk factors associated with parasitic infestation**.**

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1.Introduction

Parasitic diseases are highly endemic but patchily distributed among the 20 countries and almost 400 million people of the Middle East and North Africa (MENA) region [(1)] and disproportionately affect an estimated 65 million people living on less than US$2 per day.[(1-2)] Egypt has the largest number of people living in poverty of any MENA nation, while Yemen has the highest prevalence of people living in poverty. These two nations stand out for having suffered from the highest rates of many parasitic infections.[(1,3-4)]

Youth constitute the major and the most important sector of population. It is the age of utmost physical, mental & social fitness; activity; mobility as well as productivity. For many years, the health of young adults has been neglected because they are generally less vulnerable to disease than children or aged people. However, many health problems are enfacing them, these problems may be originated at earlier stage of life, or arise primarily in response to the risk hygienic behavior of the young people. [(5-6)] Despite the continuing improvement in the economic status, standard of living, sanitation and ecology of the Egyptian society, yet parasitic infections continue to be among the most common and persistent public health problems. These infections tend to be chronic contributing to many health troubles e.g. malnutrition and anemia which in turn result in an increased burden of diminished productivity and poor educational achievement since these infections usually occur at the period of childhood and adolescence.[(7)]

Aim of the Work

This study was carried out to:

- Determine the prevalence of some important parasitic diseases among young adult males

attending for medical examination in Qena University Hospital for different causes.

- Study the demographic, socioeconomic and medicinal features of such diseases.

2.Subjectsand methods

A group of1000adult males aged from18 to 25 years attended to Qena University Hospital for medical examination for different causes during a time period of a year (2011-2012) were subjected to the following

I-Filling a predesigned questionnaire including

Personal, demographic data and socioeconomic data . The social standard was assessed according to a score system modified after Fahmy and El-Sherbini. [8]

II- Full clinical examination:

General and systematic examinations including temperature, blood pressure, chest, heart and abdomen.

III- Laboratory investigations:

1-Blood:

Five ml of blood on EDTA was aspirated from each individual under aseptic conditions for CBC analysis.[9]

2- Stool analysis:

As well, stool samples were examined by direct fecal smear and formal-ether sedimentation techniques to detect parasitic infestations among the studied groups. [9-14]

Statistical study: [15]

The collected data were tabulated and analyzed through computer facilities using the Statistical Package for Social Science (SPSS) version 10.0 and EpiIfo software packages version 6.04.

The association between categorical variables was tested by the Chi square ″ X2 ″ test, the level of significance was set at 0.05 level

3. Results

The present study included 1000young adult men, attending for medical advice for different gastrointestinal symptoms. Their mean age was 19.2 ± 5.23 years. The great majority were single 928 (98.2%). Most were coming from rural areas 654 (65.4%). Overall, about two thirds of the studied population belongs to middle social class 664 (66.4%), low class represents 276(27.6 %) and high class were 60 (6%). Regarding education ≤9 years represents 302 (30.2%) of the studied sample and according to occupation manual worker represents 450 (45%) while jobless represents 44(4.4%)

Table (I) Figure (1) illustrate the results of stool analysis of the studied population, 44.4% of overall had parasitic infection. Young people living in rural areas had a marked significant association with parasitic infection than those living in urban areas (P<0.001). The commonest detected parasite were as following: Entamoebahistolytica (trophozoite and/or cysts) (18.4%), Blastocystishominis (11.2%), Gardialambilia (trophozoite and/or cysts) (8.2%), Enterobiusvermicularis (8%), Hymenolepis nana (6%), Ascarislumbricoides (5.8%), Taeniasaginata (4.4%), Entamoebacoli (4.2%), Cryptosporidium parvum (3.2%), Isosporahominis (2.2%), Endolimax nana (2%), Dientamoebafragili (2%), Iodamoebabutschlii (1.4%), Trichocephalustrichiuris (0.8%), Fasciola (0.2%), Heterophyesheterophyes (0.1%), and a larva (maggot) of house fly (0.1%).

Blood analysis:

As shown in table (II) blood analysis in 76.4% of studied population was free. Anemia was present in 9.8% of studied young adults, eosinophilia in13.8%.

It was obvious from table (III) that there was a significant association between parasitic infection from one side and each of anemia and eosinophilia from the other side (P<0.0001). Parasitic infection was present among 62.3% of those with low social class as compared to only 16.7% of those of high social class with a statistically significant difference (P<0.0001).

4. Discussion

Intestinal parasitic infections are among the most prevalent of human parasitic infection worldwide[9].

A number of epidemiological studies have indicated that individual infected with multiple helminthes often harbor heavier infections than individuals infected with multiple helminthes.[10] Polyparasitism may affect a considerable proportion of population, hence posing a great toll on public health.[11]

In the present work, parasitic infection was detected in 44.6% of the studied population. In Egypt many studies had been achieved to figure out the epidemiology of parasitic infections: Hassan (1994),[16] in his survey to assess parasitic infections in 791 students of 10-17 years old from Imbaba district, Giza governorate he reported an overall prevalence of 56.5%. In the same trend Curtale*et al*.,[17] detected a prevalence rate of 50% among 408 young male workers in different areas in Alexandria.

El Masry*et al*.,[18] found that prevalence of parasitic infections among children in two low socioeconomic areas in Alexandria; El Madabegh and Tobgeya was 66.7% and 43.8% respectively. From the above, it was clear that the result of the current work was lower than that of these surveys. This difference may be attributed to the age structure of the present sample as these studies were conducted mainly on children which were the most vulnerable group for parasitic infections due to their ignorance of personal hygienic habits and their high energy as they moved around too much and get more exposed to

parasitic infections. [19] In addition, El Badawy*et al*., [20] and Crompton , [21] agreed that the prevalence of parasitic infections were widely varied from place to place, time to time and person to person even in endemic areas according to two main factors; the intensity of exposure to the parasites in one hand and the combating control measures in another hand, both these factors interact together to bring out the incidence and prevalence of parasitic infections.

Table I: Results of stool analysis of the studied population according to residence

	Rural	**Urban**	**Total**
	No.65465.4%	**No.346 34.6%**	**No.1000 %**
Free =556(55.6%) **+ve=444(**44.4%) (polyparasitism)	348 306	208 138	
E. histolytica=184	101	83	**184 18.4**
B. hominis =112	72	50	**112 11.2**
G. lamblia=82	52	30	**82 8.2**
E. vermicularis =80	44	36	**80 8**
H. nana =60	33	27	**60 6**
A. lumbricoides =58	41	17	**58 5.8**
T. saginata =44	26	18	**44 4.4**
Entamoebacoli =42	26	16	**42 4.2**
C. parvum =32	19	13	**32 3.2**
Isosporahominis =22	15	7	**22 2.2**
Endolimax nana =20	12	8	**20 2**
D.fragile =20	11	9	**20 2**
I. butschlii=14	10	4	**14 1.4**
T. trichiuris =8	6	2	**8 0.8**
Fasciola=2	2	0	**2 0.2**
H.s heterophyes =1	1	0	**1 0.1**
larva of H. fly=**1**	1	0	**1 0.1**

$X^2 = 69.98$ ($P<0.001$)

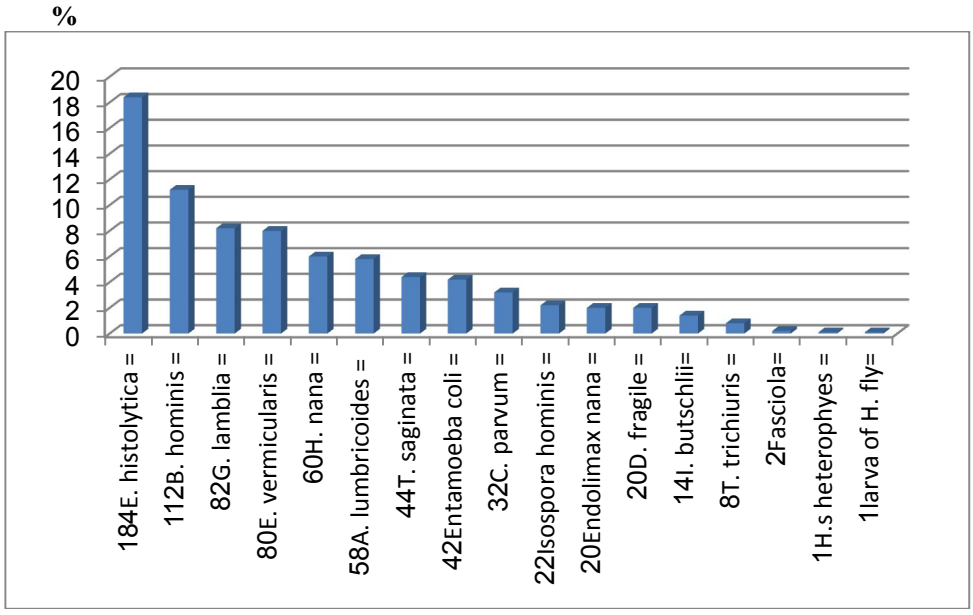

Figure (1) Results of stool analysis of the studied population .

Table II: Results of blood analysis

Results of blood analysis	Study population	
	No.	%
Anemia	98	9.8**%**
Eosinophilia	138	13.8**%**
Hematologically free	764	76.4**%**

Table III: Association of parasitic infection with anemia, eosinophilia and social class

	Parasitic infection				X^2	P-value
	No		Yes			
	No.	%	No.	%		
Anemia **(n=98)**	74	75.9	24	24.1	20.45	<0.0001*
Eosinophilia **(n=138)**	117	84.78	21	15.22	15.88	<0.0001*
Social class						
High (n=60)	10	16.7	50	83.3		
Moderate (n=664)	184	27.7	480	73.3	55.78	<0.0001*
Low (n=276)	172	62.3	104	37.7		

* Significant

Recently Elshazly*et al*., [22] in a study area included Mansoura city as an urban area and Gogar village as a rural area. One thousand individuals were randomly selected from each area. Different methods of stool examination, perianal swab and urine examination of all participants revealed that the incidence in Mansoura city was in a descending order Heterophyesheterophyes 6.4%; Enterobiusvermicularis 3.9%; Hymenienolepis nana 2.2%; Schistosomamansoni 0.5%; Trichostrongyluscolubriftormis; Strongyloidesstercoralis and Fasciola sp. were recorded as 0.2% of each. Taeniasaginata, Ascarislumbricoides and Trichocephalustrichiuris were recorded as 0.1% of each. Neither Ancylostomaduodenale nor Hymenolepisdimninuta was recorded. In Gogar, the parasitic infection was H. hetephyes 4.5%; E. vermicularis 4.1%: H. nana 3.3%; S. mansoni 1.6%; T. colubriformis 0.9%; S. stercoralis 0.5%. Fasciola sp. 0.4%; T. saginata, A. lumbricoides, H. diminuta, A. duodenale and T. trichiuris were recorded as 0.1% of each. None S. haematobiumn was detected in both areas. So, the infection rates of H. heterophyes, E. vermicularis, H. nana S. mansoni, Fasciola sp., T. colubriformis and S. stercoralis were relatively high the rural than in urban area. This was not surprising since the socioeconomic, hygienic conditions and medical services were relative high in the city than in the village. No doubt, the identifications of parasitosis pave the way for feasible treatment and control measures.

In 2009 A cross-sectional study was conducted in a village in Menoufia Governorate, Egypt where the majority of people had individual trenches in the houses for sewage disposal with absence of public sewage system. Out of 2292 stool samples 47.8% had at least a single infection. Multiple infections occurred in 14.9%. Entamoebahistolytica was 20%, E. coli 10%, Giardia lamblia 10%, Ascarislumbricoides 27.31%, Hymenolepis nana 2.96%, Schistosomamansoni 2.45% and Ancylostomaduodenale 2.23%. Males were significantly infected with S. mansoni than females. Younger age groups were significantly infected by H. nana than older ones. Working in agriculture was significantly at risk with S. mansoni and A. duodenale infections. On multiple logistic regression analysis; the risk factor most strongly associated with infection was the presence of another infected family member. (23)

Rural residency was a significant risk factor for parasitic infections among the population of the current study, where two thirds of those who had parasitic infections were from rural areas. In consistence, several national studies agreed that rural residency was a significant risk factor for harbouring parasitic infections; El Sahn, [24] mentioned that 45.2% of 1953 adolescents from cross-sectional national survey had parasitic infections with significant high rates in rural than urban regions. Similarly, Curtale*et al*. (1998),[17] in their study reported a significant higher incidence of parasitic infections among those from rural areas than urban ones. This agree with Elshazly*et al* in Dkahlia in2006 as mentioned before Habib*et al*., [25] suggested that difference between urban and rural prevalence was contributed to the behavioral and environmental differences that provoked the increased exposure to parasitic infection. Esrey*et al*., [26] mentioned that

rural community had many factors which encourage the development and maintenance of parasites as well increased the risk of exposure including poor sanitation, usage of stools as fertilizers, availability of reservoirs through animal breeding and intermediate host e.g. snails in addition to lack of health hygiene.

The current work revealed that the overall prevalence of parasitic infections decreased significantly with increase in the socioeconomic status of the studied population, i.e. it was protective factor against parasitic infections. In parallel El Sahly*et al*.,[27] observed that the low social class was significantly associated with the high incidence of parasitic infection, and described that factors enhancing exposure to parasitic infections could be exaggerated by the diminished social status e.g. bad sanitary conditions and lack of hygienic knowledge. In the present work multiple intestinal parasitic infections were found in (154 persons) 35% of the infected cases and were predominant in rural areas than urban areas and also in low social class than high social class and this agree with Nguhiu*et al*.,[11], who found that Polyparasitism may affect a considerable proportion of population, hence posing a great toll on public health and also with a study in Delta and Edo States of Nigeria done by Asemota*et al*.,[12], they found multiple intestinal infection were more predominant in Delta region.

The present study concluded a significant association between anaemia and parasitic infection among the studied young adults, In agreement, Crompton and Nesheim, [28] and Stolzfus*et al*.,[29] described that parasitic infections are usually associated with anaemia as a subsequent event, and this occurs through either malnutrition e.g. ascaris or chronic blood loss e.g. ancylostomiasis and schistosomiasis.

The present study denoted that all detected cases with esinophilia were significantly concomitant with parasitic infections. The above justification was confirmed by Silva ,[30] who illustrated that 810% of esinophilia was due to parasitic infections.

Finally in the present study the most prevalent pathogenic parasitic infections were *Entamoebahistolytica* (18.4%),Gardialambilia (8.2%), Enterobiusvermicularis (8%), Hymenolepis nana (6%), Ascarislumbricoides(5.8%),and this agree with the results obtained by Bakr*et al*.,[23] at Menoufia Governorate, Egypt that found the most prevalent pathogenic parasitic infections were Entamoebahistolytica was 20%, E. coli 10%, Giardia lamblia 10%, Ascarislumbricoides 7.31%, while the rarest parasitic infection were Fasciola (0.2%), Heterophyesheterophyes (0.1%), which found in patients coming from Delta region for study inQena University. In the present study neither Schistosomamansoni nor Strongoloidesstercoralis were detected in the studied group.

Conclusion

Rural residency and low social class were the most significant risk factors associated with parasitic infestation**.**

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