

STUDIES ON SOCIODEMOGRAPHY, CLINICAL, LABORATORY, AND TREATMENT OF FASCIOLIASIS PATIENTS IN ASSIUT HOSPITALS, ASSIUT GOVERNORATE, EGYPT

By

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Abstract

Fascioliasis, a zoonotic trematode caused by *Fasciola hepatica* and *F. gigantica* (liver fluke), is primarily a disease of herbivorous animals as sheep and cattle. Humans become accidental infected by ingesting uncooked contaminated aquatic plants such as watercress or water.

The study enrolled 135 proven fascioliasis patients diagnosed clinically, laboratory, and serologically, from MOH Fever Hospital and Assiut University Hospitals (Internal Medicine, Children and Al Rajhy) in period from October 2018 to September 2019.

The results showed that patients were from Manfalut City suburbs, urban areas (88.9%) with ages ranged between 13 & 69 (45.98±22.14) years and (57.8%) were females. The high infection rate in adults (63%) aged 25-64 years with significant relations between eosinophilia and *Fasciola* antibody titer, as well as HFL and *Fasciola* extraction with ERCP.

Keywords: Assiut, Fascioliasis, Manfalout suburbs, Sociodemographic, Diagnosis, Treatment

Introduction

Fascioliasis is a worldwide zoonosis trematodes (Manuel *et al*, 2018), total estimated number of patients was 2.4 million in 61 countries and that the number at risk was more than 180 million worldwide (Webb and Cabada, 2018). Fascioliasis *gigantica* was encountered among man and herbivorous animals and donkeys as an Egyptian public health problem affects human welfare (Haseeb *et al*, 2002). In Egypt, *Lymnaea* species is snail intermediate for both *F. gigantica* and *F. hepatica* (Farag, 1998). Also, Farag and El Sayed (1995) in Alexandria reclaimed areas found *Biomphalaria alexandrina* harbored the immature stages of *F. gigantica*. El Shazly *et al*. (2002b) found *L. truncatula* harbored immature stages of *Fasciola* species. Haridy *et al*. (1999) found that from the year 1994 to 1997 fascioliasis overall rates in slaughtered animals were 2.02% for sheep and goats, 3.54% for cattle and 1.58% for buffaloes. Patients usually become infected by eating raw watercress and other water plants contaminated or drinking contaminated water with immature parasite larvae. Young ones move via the intestinal wall, abdominal cavity, and liver tissue, into bile ducts, to

develop into mature adults that produce eggs, with pathology typically most pronounced in bile ducts and liver (CDC, 2020). However, ectopic fascioliasis was reported in Egypt (El Shazly *et al*, 2002a).

Acute and chronic phases of infection can be symptomatic or symptom free. Nonspecific clinical features of both phases can include the following: Fever, which can be intermittent; Malaise; Abdominal pain; in right upper quadrant, epigastrium, or more diffuse/generalized; others (such as anorexia, nausea, vomiting, diarrhea, change in bowel habits, and weight loss) and signs (such as hepatomegaly and jaundice); Eosinophilia, more prominent and less variable during acute phase than in chronic one; Anemia, especially in children; and Transaminitis (during chronic phase, laboratory testing can indicate hepatobiliary obstruction (Abo-Madyan *et al*, 2004).

The parasitological diagnosis based on the detection of *Fasciola* eggs in stool, duodenal contents or bile aspiration was usually unsatisfactory due to false passage of eggs, ectopic fascioliasis, such as lungs, subcutaneous tissue, pancreas, genitourinary tract, eyes, or brain and failure of immature worm to matu-

ration (Hassan *et al*, 2008). Thus, ELISA-Fhes antigen (*Fasciola hepatica* excretory/secretory) and IHAT were evaluated in proven cases of human fascioliasis compared with proven cases of human schistosomiasis *mansoni* and parasite free individuals. The ELISA-Fhes gave 100% sensitivity & 100% specificity. But, IHAT was less sensitive and less specific (Hasseb *et al*, 2003). The coprological techniques, serological tests and other non-invasive diagnostic methods were applied to diagnose human fascioliasis (Bahram *et al*, 2020)

The present study aimed to identify prevalence of human fascioliasis among Manfalut City inhabitants (Assiut Governorate), as to sociodemographic & laboratory data, seasonal prevalence, and triclabendazole (TCBZ) response over one year started from October 2018 to September 2019.

Materials and Methods

Ethical approval: The study design & pro-

ocol were approved by the Institutional Review Board of Faculty of Medicine, Assiut University, Egypt, which went according the International Rules of Helsinki (2000).

Study design and site: Descriptive cross-sectional study enrolled 135 patients already diagnosed as hepatic fascioliasis lived in Manfalut City Suburbs. Demographic medical data were collected from the records of Fever Hospital and Assiut University Hospitals (Internal Medicine, Children and Al Rajhy) in period from October 2018 to September 2019.

Results

In the present study, only 3/135 of fascioliasis proven patients showed eggs in stools by microscopy. Others were diagnosed by clinically, high eosinophilia, positive serology, abdominal U/S or *Fasciola* extraction by ERCP.

Details were given in tables (1, 2, & 3), and figures (1, 2, 3, & 4).

Table 1: Medical records of fascioliasis patients.

Variations	N= 135
Age (years)	13-69
Mean	45.98 ± 22.14
Age group: ≤ 14 years	24 (17.8%)
15-24 years	18 (13.3%)
25-64 years	85 (63%)
≥ 65 years	8 (5.9%)
Male	57 (42.2%)
Female	78 (57.8%)
Manfalut suburbs urban areas	120 (88.9%)
Manfalut suburbs rural areas	15 (11.1%)
Clinical pictures: Abdominal pain	123 (91.1%)
Fever	51 (37.8%)
Jaundice	25 (18.5%)
Laboratory: Eosinophilia	114 (84.4%)
Egg in stool	3 (2.2%)
<i>Fasciola</i> antibody: Negative	31 (23%)
Positive	104 (77%)
Season: Autumn	75 (55.6%)
Summer	29 (21.5%)
Winter	18 (13.3%)
Spring	13 (9.6%)
Response to treatment: 1 dose	118 (87.4%)
2 doses	14 (10.4%)
3 doses	3 (2.2%)

Table 2: Characteristics of patients based on sex

Variations	Male (n= 57)	Female (n= 78)	P value
Mean age (years)	47.18 ± 12.14	45.01 ± 17.89	0.98
Manfalut suburbs urban areas	51 (89.5%)	69 (88.5%)	0.19
Manfalut suburbs rural areas	6 (10.5%)	9 (11.5%)	
Clinical pictures: Abdominal pain	53 (93%)	76 (97.4%)	0.20
Fever	21 (36.8%)	30 (38.5%)	0.49
Jaundice	9 (15.8%)	16 (20.5%)	0.32
Laboratory: Eosinophilia	4 (7%)	17 (21.8%)	0.01*
Eggs in stool	1 (1.8%)	2 (2.6%)	0.42
Antibody: Negative	9 (15.8%)	22 (28.2%)	0.22
Positive	48 (84.2%)	56 (71.8%)	
Season: Autumn	32 (56.1%)	43 (55.1%)	0.07
Summer	16 (28.1%)	13 (16.7%)	
Winter	3 (5.3%)	15 (19.2%)	
Spring	6 (10.5%)	7 (9%)	
Response to therapy: 1 dose	54 (94.7%)	64 (82.1%)	0.07
2 doses	3 (5.3%)	11 (14.1%)	
3 doses	0	3 (3.8%)	

Table 3: Characteristics of patients based on residence in Manfalut suburbs

	Rural areas (n= 15)	Urban areas (n= 120)	P value
Mean age (years)	47.67 ± 19.87	43.09 ± 20.12	0.03*
Age group: ≤ 14 years	1 (6.7%)	23 (19.2%)	0.02*
15-24 years	0	18 (15%)	
25-64 years	11 (73.3%)	74 (61.7%)	
≥ 65 years	3 (20%)	5 (4.2%)	
Male	6 (40%)	51 (42.5%)	0.54
Female	9 (60%)	69 (57.5%)	
Clinical pictures: Abdominal pain	13 (86.7%)	116 (96.7%)	0.13
Fever	6 (40%)	45 (37.5%)	0.53
Jaundice	1 (6.7%)	24 (20%)	0.18
Laboratory: Eosinophilia	10 (66.7%)	104 (86.7%)	0.06
Egg in stool	0	3 (2.5%)	0.07
Antibody: Negative	6 (40%)	25 (20.8%)	0.41
Positive	9 (60%)	95 (79.3%)	
Season: Autumn	6 (40%)	69 (57.5%)	0.46
Summer	5 (33.3%)	24 (20%)	
Winter	3 (20%)	15 (12.5%)	
Spring	1 (6.7%)	12 (10%)	
Response to therapy: 1 dose	13 (86.7%)	105 (87.5%)	0.42
2 doses	1 (6.7%)	13 (10.8%)	
3 doses	1 (6.7%)	2 (1.7%)	

Discussion

Manfalut (Arabic: منفوط) is a city located on the Nile west bank, in Assiut Governorate, at 350 km south of Cairo. The local agriculture includes cotton production, pomogrates, palm trees and green vegetables. Egyptian writer and poet Mustafa Lutfi al-Manfaluti was born in Manfalut. Manfalut city is one UNESCO world heritage site nearby, the Ancient Thebes with its Necropolis in a distance of 239 km, South-East.

In the present study, all 135 patients were diagnosed fascioliasis with ages between 13 and 69 years old (45.98±22.14). The majority 85 (63%) were at age group 25-64 years. This agreed with Mekky *et al.* (2015), Assiut

Governorate and with Perrodin *et al.* (2019) in Switzerland. But, it disagreed with Mas-Coma *et al.* (2009) and Victoria Periago *et al.* (2021) who reported that in the Nile Delta Governorates fascioliasis showed a peak among school children of age group 7-10 years.

In the present study, patients 120 (88.8%) were from Manfalut City Suburbs. This agreed with Ramadan *et al.* (2019) who reported that all recorded patients lived in Manfalut City Suburbs. But, Victoria Periago *et al.* (2021) reported that the highest numbers of fascioliasis were in children lived in Kafr El Dawar and least ones were in Damanhour City, the capital of the Beheira Governorate,

due to ongoing large urbanization of all over Egypt. In the present study, 78 (57.8%) were fascioliasis female patients. This agreed with Curtale *et al.* (2007) who reported that infection was higher among girls in the Nile Delta. Also, Ali *et al.* (2014) in Sharkia Governorate and Victoria Periago *et al.* (2021) in the Nile Delta Governorates reported that up to (60.4%) in females. Higher infection rate among females could be explained by fact that they often involve in tasting food, while cooking, and exposed to fresh raw vegetables in green salad preparations (Curtale *et al.*, 2007), but disagreed with El-Shabrawi *et al.* (1997) in Cairo pediatric patients, and Mekky *et al.* (2015) who found higher fascioliasis rate among males.

In the present study, there was significant correlation between sex and eosinophilia. Females patients had frequency of higher eosinophilia as well as response to TCBZ treatment with significant association between residence in Manfalut Urban Suburbs and *Fasciola* extraction with ERCP ($P=0.04$). But, Ramadan *et al.* (2019) reported that the patients' sex didn't show significant difference to TCBZ treatment.

In the present work, the commonest presentation among patients was abdominal pain (91.1%). This agreed with El Shazly *et al.* (1991) and Hassan *et al.* (2005) in Egypt and Bashiri *et al.* (2021) in Iran. The present eosinophilia was in 114 (84.4%) patients. This agreed with El Shazly *et al.* (1991), El Shabrawi *et al.* (1997), Mekky *et al.* (2015), and Fica *et al.* (2012) in Chile, they found that high eosinophilia was a milestone to suspect parasitic infection. Moreover, there were significant relations between eosinophilia and *Fasciola* antibody titer on one side and HFL and *Fasciola* extraction with ERCP on the other side. This agreed with El Shabrawi *et al.* (1997), Mekky *et al.* (2015). Although eggs in stool were one the main diagnostic feature for fascioliasis in many private labs, yet in the current study detected only 3/135 (2.2%) patients had *Fasciola* eggs. This agreed with Ali *et al.* (2014) who found only 9/

200 (4.5%) patients had *Fasciola* eggs, Mekky *et al.* (2015) recorded only 2/23 patients with *Fasciola* eggs in stools, and Ramadan *et al.* (2019) recorded *Fasciola* eggs in 7/67 (10.4%) patients. Besides, no *Fasciola* eggs were detected in Qena Governorate by Hussein and Khalifa (2010) or in Minia Governorate by Abdel-Hafeez *et al.* (2012).

In the present study, the IHAT test detected *Fasciola* antibodies in 104/135 (77%). El Shabrawi *et al.* (1997) reported IHAT positivity in seven fascioliasis patients who didn't pass egg in stools. Bayhan *et al.* (2020) in Turkey found that almost all children patients had positive IHAT.

In the present study, more than half of cases 75/135 (55.6%) were diagnosed during autumn season. This agreed with Mas-Coma *et al.* (2018) and Bashiri *et al.* (2021), they reported significant high fascioliasis rate during autumn. As to effect of treatment, present study showed that 118/135 (87.4%) of patients responded to single dose of TCBZ, but the 2nd and 3rd doses were indicated in 14 (10.4%) and 3 (2.2%) respectively. This agreed with Fica *et al.* (2012), and Perrodin *et al.* (2019). But, Mekky *et al.* (2015) reported patients were cured with two doses of TCBZ. Morales *et al.* (2021) in Peru reported that the treatment efficacy of TCBZ was 55%, 38%, & 30% after 1st, 2nd & 3rd doses respectively followed the retrospective cohort study of children.

Conclusion

No doubt, fascioliasis is a worldwide health problem especially in developing countries. Stool was less sensitive, and human diagnosis must rely on clinical diagnosis (abdominal pain, fever, high eosinophilia) supported by laboratory, serological and radiological results.

The individual people particularly in country-sides can protect themselves by avoiding eating raw watercress and other water plants, or consuming contaminated water especially from the fascioliasis-endemic grazing areas.

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Explanation of figures

Fig. 1: Age groups of patients in and outside Manfalut City Suburbs.

Fig. 2: Manfalut City general view.

Fig. 3: Hotel view in Manfalut City.

Fig. 4: Tuna el Gebel Museum.

