Original Article

Neglected Human Fascioliasis in IRAQ: A Retrospective Study of Human Fascioliasis at North of Iraq

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Abstract

Fascioliasis is an often-neglected zoonotic disease caused by liver fluke Fasciola hepatica and Fasciolagigantica(1). The life cycle of this parasite starts when eggs in mammalian stool are deposited in tepid water (22-26°C) and hatch in within two weeks, miracidia appear and develop. These miracidia invade many species of freshwater snails, in which they further develop to sporocyst and redia for 4-7 weeks. They leave as free-swimming single tailed cercaria that subsequently attach to watercress, water lettuce, mint, parsley, or khat (2, 3). They encyst within few hours and wait to be eaten by the definite host, humans (4). The metacercariae exist in the small intestine is releasing the young parasites, which rapidly penetrate the intestinal wall and enter the peritoneal cavity. The immature flukes penetrate the capsule of Glisson after 48h and enter the liver then migrate throughout the hepatic parenchyma till they reach the biliary system where they become adults within 3 to 4 months from the initial infection and lay eggs (4).

World health organization now recognizes human Fascioliasis as a significant public health problem and a neglected tropical disease with a great impact on human development (4).

The burden of infection is unclear, and studies have shown the geographic expansion of fascioliasis in human and livestock likely related to climate change(5). This study aims to highlight the sociodemographic characteristics of human fascioliasis in a newly emerged endemic area at north of Iraq.

Key words: fasciola hepatica, cercaria, watercress, neglected tropical disease

Introduction

Fascioliasis is an important zoonotic parasitic disease that affects animals and humans worldwide (6). Fascioliasis is transmitted to herbivorous animals and humans through the consumption of contaminated water and green aquatic vegetables (7).

Maintain the cycle between animals which is mainly sheep, cattle and water buffalo is the

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presence of fresh water snails of the family Lymnaeidae (intermediate host of fasciola hepatica) is more commonly identified in temperate zones [8].

Human considered as accidental hosts that is only sporadic human cases have been documented (eg., in the USA) whereas hyperendemic in some region (eg., the Andean highlands of Bolivia and Peru) [9].

Fasciolosis is regarded as a major challenge to livestock productivity worldwide, but the burden of disease in humans has only started to receive some attention in the past three decades.

Over the past three decades, fasciolosis has also gained more attention as an important (re-) emerging but neglected tropical disease in humans, predominantly affecting vulnerable people living in acute poverty [10].

Globally, 17 million people are estimated to be infected with liver fluke while about 180 million are at risk of infection [11].

It is found in Oceania, Asia, Africa, the Middle East, Europe, the Caribbean, and parts of Latin America. In some areas there are animal fascioliasis found while human cases are uncommon or sporadic. In other areas, human fascioliasis is common and endemic [12, 13, 14, 15].

As a result, the World Health Organization (WHO) has included fascioliasis among the group of Foodborne Trematodiases in the priority list of Neglected Tropical Diseases (NTDs) in its WHO NTD Roadmaps for 2020 and 2030 [16,17]. TheWHO has also very recently emphasized the convenience of achieving the roadmap targets noted for these trematodiases through a cross-cutting One Health approach [18].

There is a lack of epidemiological data on fascioliasis in Iraq regarding disease characteristics, diagnosis, and mode of transmission and prevention of it across different governorates.

Understanding the distribution of fasioliasis can help the development of preventive measures to control the disease.

We aimed to identify the demographic, epidemiologic, laboratory, and radiological characteristics of patients diagnosed with fascioliasis at north of Iraq.

Materials and Methods

The current study was a retrospective study. The data was collected at hospitals in the north of Iraq (mainly Sulaymaniyah, Duhok, Irbil, Kirkuk, Salaheldin) and sent to CDC Iraq at Bilharzia and STH section.

A total of 225 patients diagnosed as fascioliasis were included in aretrospective study from April 2016 to January 2024. The study retrospectively included demographics data (health directorate, sex, age). Also include laboratory results (eggs in stool) which is done by general stool examination and ultrasound findings. Environmental data collected about water source, eating vegetables and contact with animals.

Data was collected and reviewed carefully to ensure data quality. Data entry, cleaning recording, and analysis were done using SPSS software version 26 (IBM SPSS Inc., Chicago, US) for windows 10. Descriptive statistics were calculated as the mean for normally distributed quantitative variables and as a median and interquartile range for non-parametric quantitative variables and as frequency and percentages for categorical variables.

Results

Out of total, 219 (97.3 %) were diagnosed as fascioliasis from Sulaymaniyah health directorate while 3 (1.3%) from Duhok health directorate and 3 from Irbil, Kirkuk and Salahaldin. Fascioliasis mainly recorded from Sulaymaniyah as shown at table 1.

Table 1: Distribution of fascioliasis according to Health Directorate:

Health Directorate	Frequency	Percentage %
Sulaymaniyah	219	97.3
Duhok	3	1.3
Irbil	1	0.4
Kirkuk	1	0.4
Salaheldin	1	0.4
Total	225	100

Fascioliasis was diagnosed mainly on female 171(76%) than male 54(24%). High percentage of fascioliasis was recorded at (20-39) years 47.1% while the low percentage recoded at (5-19) years 3.6%. Fascioliasis recorded at (40-59) years was 39.6% which is also high percentage but less than (20-39) years as shown at table 2.

Table 2: Distribution of fascioliasis according to sex and age:

Sex	Frequency	Percentage %	Ratio
male	54	24.0	Female : Male
female	171	76.0	3:1
Total	225	100.0	
Age (years)	Frequency	Percentage %	Mean and median
5-19	8	3.6	Mean
20-39	106	47.1	56.25
40-59	89	39.6	
Above 60	22	9.8	median
Total	225	100.0	55.5

The general stool examination at table 3 showed eggs of fasciola hepatica (122) patients while (103) of them the examination not revealed the presence of eggs in stool. Ultrasound examination showed changes of liver or GB and bile ducts in 48% while 52% showed no changes at ultrasound examinations.

Table 3: Diagnosis of Fscioliasis according to eggs in stool and ultrasound findings:

Eggs in stool (GSE)	**Frequency**	**Percentage %**
Yes	122	54.2
No	103	47.8
Total	225	100
Ultrasound findings (liver, GB, bile duct) changes	**Frequency**	**Percentage %**
Yes	108	48.0
No	117	52.0
Total	225	100.0

Table 4 showed that 201 patients of fascioliasis were eating aquatic vegetables while 24 of them were not eating it. Patients drank public water were 94.7% while 5.3% were drinking from bottles or RO. Patients with fasioliasis who were in contact with animals were 29 while 196 were not in contact with them.

Table 4: Distribution of fascioliasis according to environmental factors:

Eating vegetables (aquatic vegetables)	**Frequency**	**Percentage %**
Yes	201	89.3
No	24	10.7
Total	225	100.0
Source of water	**Frequency**	**Percentage %**
Public	213	94.7
Many sources (bottles, RO)	12	5.3
Total	225	100.0
Contact with animal	**Frequency**	**Percentage %**
Yes	29	12.9
No	196	87.1
Total	225	100.0

Discussion

The obvious high rate of fascioliasis at Sulaymaniyah (97.3%) could be explained that Fascioliasis is indeed an emerging disease and also considered as amajor health problem in limited-resource countries as Iraq (especially Sulaymania) and Egypt[19,20]. Also, studies at Sulaymaniyah shows that high rate of fasciola hepatica among cattle, goats and sheep which is mostly similar sequences from Iran and Saudi Arabia[21,22]. lastly there was increase demand to meat consumption and usually imported meat is cheaper than locally[22]. Although Fascioliasis is endemic in our neighboring countries (Turkey and Iran), but it seems to be an emerging health problem at north of Iraq and also in whole Iraq[23].

This study showed that Female has high rate (76%) than male which showed (24%). Patients at (20-39)-(40-59) years showed the high rate 47.1% and 39.6 respectively while (5-19) and (60 and above) shows low percentage 3.6% and 9.8% respectively. Previous studies showed that societal factors are associated with human fascioliasis including gender [24,25], age [25].

Eggs in stool was detected in 103 patients while it was negative in 122 patients. Studies on fascioliasis diagnosis revealed that stool examination as non-reliable test[26,27].

In our study, abdominal ultrasonography was the imaging modality most commonly, used for all of the 225 patients. It showed abdominal findings occurred in 108 patients while 117 there was normal. Ultrasound changes were detected in other reports for human fascioliasis as hepatomegaly, cholecystitis, liver abscess[28, 29].

About 201 patients of fascioliasis was eating aquatic vegetables while 24 of them wasn't eat it. High percentage of patients drank public water was 94.7% while 5.3% was drank bottles or RO. Studies showed that humans become infected after eating aquatic plants on which encysted organisms are present or by drinking contaminated water[30,31].

Patients with fasioliasis who was contact with animals was 29 while 196 wasn't contact with them and this is because the distribution of fasciolosis is largely dependent on the presence of a competent intermediate snail which is the intermediate host of Fasciola hepatica and there is no direct transmission between animals and humans [32].

Conclusion

Neglected human fascioliasis is an emerging public health problem at north of Iraq. Public awareness about human fascioliasis, its effect on human, ways of transmission and prevention of spread is of high importance, which is more easily preventable than to diagnose and treat.

Conflict of interest: Nil

Source of funding: Self-source

Ethical clearance: Official permission was obtained to access data from the CDC Iraq at 28-3-2024. Privacy and confidentiality of all data were assured as data sheets were coded with numbers to maintain anonymity. The study was conducted in accordance with the Helsinki Declaration's ethical guidelines. As the study is retrospective, patients' consent was waived by the Ethics Committee at the Central Directorate of Research and Health Development and review in the Iraqi Ministry of Health.

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