

THE IMPORTANCE AND INCIDENCE OF FOOD BORN HELMINTH INFECTIONS IN MAN IN IRAN

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ABSTRACT

A wide variety of helminth parasites, which are quite prevalent in Iran, can infect man by the oral route. The main source of infections are meat, vegetables and water.

Some of these parasites, e.g. *Cysticercus bovis*, *C. cellulosae*, *Trichinella spiralis* and *Anisakis* larvae, are present in the tissue of food animal. Human infection establish by consuming raw or inadequately cooked pork, beef or fish.

The infective stages of some helminths, e.g. *Trichostrongylus spp.*, *Ascaris lumbricoides*, *Trichuris trichura*, *Fasciola spp.* *Dicrocoelium dendriticum* and *Dracunculus medinensis* may infect man through vegetables and drinking water. Using human and animal manure as fertilizer of the soil, facilitate the transmission of these parasites to man.

Contaminated food materials can play also a role in human hydatidosis.

Hygiene is a key factor in the control of all conditions and both medical and veterinary profession have an important function in this field.

INTRODUCTION

Food-born diseases caused by the helminths are quite prevalent all through the country. Because of traditional habit of living specially in nomadic and rural areas, the risk of food contamination with parasites is normally high.

Hygiene is a key factor in the control of all conditions and both medical and veterinary profession have an important function in this field.

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Among the various agents which are responsible for the establishment of food-born infections in man, meat, vegetables and water are mainly involved and their importance will be discussed in the same order.

A. *Meat* :

1 — *Cysticercus bovis*

The disease is commonly recorded in slaughterhouse. Consuming of infected beef with *Cysticercus bovis* as raw or semi-cooked products causes human taeniasis due to *Taenia saginata*. Beside of meat, infected liver or lungs may also take a role in transmission to the man under condition.

The incidence of adult tapeworm in man cannot be figured out accurately, and is estimated about 1 per cent in Iran (1) the rate of infection varies from one part to another. The highest is 17 per cent recorded from Mazanderan (2) and the lowest 1 per cent from Meshed (3).

The data collected from Tehran abattoir shows that 13 per cent of the cattle are infected with *cysticercus bovis* (4).

2 — *Cysticercus cellulosae* :

The data has recorded the rare case in pig slaughtered (0.02 per cent) and boars hunted and inspected at abattoirs in Iran (5). There is no information concerning the presence of adult worm (*Taenia solium*) in man. On the other hand the mode of transmission for this cestode is similar to that of *Cysticercus bovis*.

3 — *Trichinella spiralis* :

Although examination of pig meat using trichinoscope is a routine practice in Tehran abattoir, the infection is not recorded yet. But from 1852 carcasses of boars examined for *Trichinella spiralis* the larva was found in 2 of theme (6). This parasite has been reported also from wild cat and jackal (7). The only case of human infection in Iran which was reported by Moin (8) was diagnosed by mean of serological tests only.

Products of pork and boars are considered the vehicle of transmission. If non infected meat be cut by an infected knife with larvae of *T. spiralis*, when such meat is consumed in raw or semi cooked conditions, the parasite may be transferred indirectly to man.

4. *Anisakis Spp.*:

Several reports (9) and (10) suggest that larvae of some nematodes in fish,

can cause visceral larva migrans, leading to eosinophilic granuloma of intestinal tract in man when the fish is eaten raw or inadequately cooked.

The larvae normally found in body cavity of fish, migrate to the flesh when not inhibited by salt. Although there is no report concerning the presence of the disease in man in Iran, larva of *Anisakis* was found in different species of fish from both Caspian sea and Persian Gulf (11) and (12) whereas eating raw marine fish is not a common practice, there are some areas where uncooked smoked or salted fish is eaten, and this might cause human infection.

5 — *Diocotophyma renale* :

This infection is recorded from dog and jackal from Caspian sea (12) and from a woman in Mianeh (East Azarbayejan) (14).

Special kind of fish from Cyprinidae family if consumed raw or semi-cooked cause the transmission of parasite to man.

6 — *Hydatid cyst* :

Indirect role of the infected viscera of ruminants is very important in etiology of human hydatidosis. In most parts of the country the infected viscera is usually eaten by dogs which are the main source of human infection.

Hydatid cyst is commonly found in livestock as well as in man and adult form among dog, wolves and jackal (15).

Vegetables can also serve as a vehicle to transmit the egg of *Echinococcus granulosus* to man and cause hydatidosis.

B. *Vegetables* :

1. *Trichostrongylus spp.*

Trichostrongyliasis is more prevalent among nomadic and rural people as the reason of direct and constant contact with animal and infected pasture. Its transmission is realized by infected raw vegetables with the larvae of nematode. Seven species are recorded, of which *T. orientalis* and *T. axei* are the species most commonly seen in man and animal respectively (16) and (17).

In some parts of Iran, the animals manure is still used as a main fertilizer of the soil which certainly facilitates the transmission of parasite to man.

In this respect, other member of family *Trichostrongylidae* e.g. *Haemonchus contortus*, *Ostertagia ostertagi* and *Marshallagia marshalli*, which are reported from man in Iran (18) require the same mode of transmission.

On the other hand the egg of *Ascaris hombricoids* and *Trichuris Trichura* will infect man, through vegetables and water.

2. *Fascioia spp. and Dicrocoelium dendriticum* :

Consuming of raw vegetables as appetizers and a part of the main meals is very common in Iran, so transferring either the metacercaria of *Fasciola hepatica* (especially through consuming water cress) or infected ants, second intermediate host of *Dicrocoelium dendriticum* by eating this food stuff is always possible.

Several human cases of Fascioliasis (19) and (20) and 3 cases of Dicrocoeliasis (21) have been recorded from Iran. This indicates the role of vegetables as a source of parasitic infection for man. On the other hand the cercaria of *Fasciola* spp. can infect man also through drinking water.

Fascioliasis due to *F. hepatica*, *F. gigantica* and dicrocoeliasis are also quite prevalent in domestic animals (22) and (23) in Iran.

3 — *Dracunculus medinensis* :

Human infection which was prevalent from ancient times in Iran, is restricted now to one Province (Fars) extending from South of the City of Djahrom to the Persian Gulf between the ports of Lengueh and Bushehr (24). The rate of infection in the villages situated in this area was reported between 1% to 8% (25). The only case of infection in dog is recorded from Shiraz by Targari (26). Man and animal become infected through drinking water infested with the Cyclops intermediate host of this nematode.

DISCUSSION

According to the above mentioned considerations, the foods of animal and plant origins are always exposed to be infected by metazoan parasites. So, they may play a role in etiology of human and animal parasitic diseases.

In addition the nomadic type of living and travelling for finding new pastures constantly make the parasite disseminated, as the over contamination of animals through new pastures is also feasible of course, in these regions, the facilities for parasitic diseases control are not exactly effective. These difficulties have mutual interaction over animal-human and food infection.

In the infected area, eradication of parasitic diseases of animal is nearly impossible and therefore, the consumption of raw foods should be prohibited.

On the other hand co-operation between doctors, public health officers, and veterinary surgeons would be of great help to eradicate the infections with a greater understanding of the part each can play, and of the inter-relations between the parts played by the different disciplines there is no reason why the incidence of these diseases should not be greatly reduced, if not eliminated, from this country.

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