

Trichinellosis in Iran

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Abstract

Trichinellosis is both of veterinary and medical importance in countries where pig breeding and pork consumption exists. In Iran, people are forbidden to consume pork because of the religious regulations. Therefore, there have not been any human cases over the past decades except a doubtful case based on serological test. Although there are some sylvatic trichinellosis in wild life in different parts of Iran, but a little is known about the current prevalence in wild animals. To date, some cases of *Trichinella nelsoni* in golden jackals from Khuzestan Province; *Trichinella spiralis* in wild boars, brown bears, golden jackals, jungle cat, from Mazandaran Province and stray dogs, Jackals, red fox, hyena, *Meriones persicus* in Isfahan; finally *T. spiralis nelsoni* in *Herpestes auropuntatus* from Khuzestan were reported. Based on these data and consumption of animal derived food products among some local hunters, and not a safe and insure rodent control, trichinellosis could be concern as an emerging disease, so more investigation and clinical awareness are needed in this regard.

Keywords: *Trichinellosis, Epidemiology, Iran*

Introduction

Trichinellosis is a zoonotic disease. Rats and rodents are primarily responsible for maintaining the endemicity of *Trichinella* infection. Carnivours/ omnivours animals, such as pigs, become infected by ingestion of meat from infected rodents and other carnivores or omnivores. People, are infected by eating animals' meat which are infected with *Trichinella*, which depends on animal husbandry practices for domestic species and access to wild game for sylvatic species. The life cycle of encapsulated species of *T. spiralis* is primarily between rodents and pigs whereas the non-capsulated species have much wider host distribution (1).

Over the last decade, the application of molecular and biochemical methods in conjunction with experimental studies on biology have resulted in the identification of seven *Trichinella* species, which have distinct epidemiological and geographical distributions. Although the species are difficult to be differentiated morphologically, they can be typed with molecular and certain biological characters (2).

Epidemiology

Examination of 4,950 carcasses of wild boars hun-

ted in Mazandaran and Guilan provinces from 1961 to 1967 revealed the existence of *T. spiralis* in 2 wild boars (3). From 1967 to 1971, 5 wild boars hunted from different parts of Caspian region, 38 golden jackals and 2 jungle cats hunted in the Nour forest near Amol and Hashtpar in northwest of Iran, although were found infected with *Trichinella* larvae, not even a single rodent including house mouse (*Mus musculus*), wood mouse (*Apodemus sylvaticus*), and black rat (*Rattus rattus*), shrews (*Crocidura russula*), common bager (*Melis melis*) were found infected (4) (Fi.g 1: Nos.5, 26, 27 dotted areas).

A doubtful case of human infection was reported based on clinical symptoms, and the history of eating undercooked wild boar meat, as well as presence of low titer circulating antibody in the serum of the patient (5).

In 1973, 10 jackles, 2 golden jackles (*Canis aureous*), 2 red foxes (*Vulpes vulpes*), 1 hyena, and 1 Persian jird (*Meriones persicus*) were found infected with *T. spiralis* in Isfahan, the latest is of interest because in spite of efforts made by Mobedi et al. in 1973 in northern part of Iran, no rodents with this parasite was found (6) (Fig. 1: No. 24 dotted area). In 1987, two isolates of *Tri-*

chinella were obtained from jackal and *Canis aureus*; one from north of Caspian identified as *T. spiralis*, the other from south-west (Khuzestan) identified as *T. nelsoni* (7). In 2000, one stray dog reported infected with *T. spiralis* among 75 dogs (1.4%) in Isfahan (8), while previous investigations revealed that 84% of golden jackals, 9% of dogs and 28% of jackals in countryside of Isfahan were infected with this parasite (Fig. 1: No. 24 dotted area).

In 2000, a new reservoir host for *T. spiralis nelsoni* was identified as *Herpestes auropunctatus* (mongoose) in Khuzestan Province and 3 of 10 captured animals were infected with *Trichinella* larvae, the larvae obtained from mongoose were infective for rat and white mouse (more investiga-

tion is required to differentiate the isolates, but at present most of isolates in south of Iran are attributed to *nelsoni* (9). In 2006, 2 wild boars among 60 boars and 2 *H. auropunctatus* among 10, were found infected in Khuzestan (10) (Fig. 1: No.15 dotted area). So far, bear, Jackal and wild cat have been mostly reported as natural host for *Trichinella* according above reports. Finally, in 2006 a wild cat (*Felis chaus*) was found infected with *T. spiralis nelsoni* in Soosangerd or south west of Ahwas (10).

Recently, using molecular methods, a case of trichinellosis in a family in Tehran was confirmed. This family had consumed boar meat infected with *Trichinella* (11).

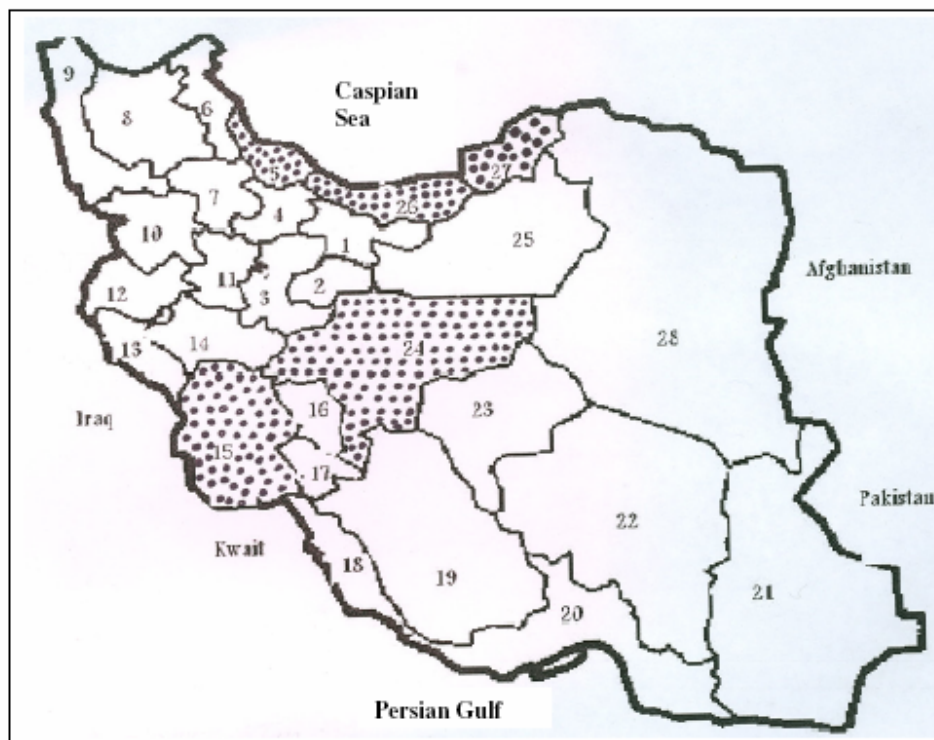


Fig. 1: Dotted areas in north, center, and south west of Iran which were identified with infected animals. No. 5 -Guilan, No.15- Khuzestan, No.24- Isfahan, No.26, 27- Mazandaran

Discussion

In Iran due to social, economic and religious factors, the risk of *trichinellosis* has lowered among wild animals but sporadic cases still exists among carnivores like fox, boar, jackal, hyena in some areas.

In such circumstances there will be a possibility of emergence and reemergence of the infection in previously unaffected areas.

New *Trichinella* species, such as *T. murrelli* and *T. pseudospiralis*, in outbreaks make diagnosis of

trichinellosis more complicated since all infections are believed to be caused by *T. spiralis*. The species most frequently associated with human and animal infection is *T. spiralis*, which is normally found in domestic pigs. The domestic cycle of *T. spiralis* involves a complex set of potential routes. Transmission on a farm may result from predation on or scavenging other animals (for example, rodents), hog cannibalism, and the feeding of uncooked meat scraps. Until recent years, outbreaks predominantly resulted from consumption of *T. spiralis* infected pork in local, single source outbreaks; however, increasingly, the mass marketing of meat can disseminate the parasite throughout a large population. Also of importance is the growing proportion of outbreaks caused by sylvatic *Trichinella* species, either directly through game meat or through spillover to domestic animals. Recent reports also indicate that infected herbivores (horses, sheep, goats, and cattle) have been the source of outbreaks, a new variation on the traditional model of trichinellosis epidemiology. Examples are recent human infections attributed to *T. pseudospiralis* in New Zealand in 1994, and in Thailand where 59 people were infected by pig meat, then in France where an outbreak from wild boar meat occurred in 1999. Infection with wild animal species of *Trichinella* is far more common than is generally recognized. Its importance in even developed countries is exemplified by the fact that over 20 000 cases have been occurred in Europe from 1991–2000 (12). In Iran based on recent findings of infected rodents and small mammals, this parasite can be a serious threat for most carnivores and human.

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