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Case Reports

Hymenolepis diminuta (Rodolphi, 1819) Infection in a Child from Iran

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Abstract

Hymenolepis diminuta is a cestode frequently found in rodents and humans. Species of flour moths of the genus *Pyralis* and beetles in the genus *Tribolium* are common intermediate hosts. Humans can be accidentally infected through the ingestion of the insects, including larvae in precooked cereals, dried fruits or other food items, and directly by ingesting the insects from the environment. This tapeworm, while infrequently encountered, has been reported from many parts of the world. In this paper we report the first case of infection with *H.diminuta* in Iran since 1972.

Keywords: Hymenolepis diminuta, *Cestodes, Case report, Iran*

Introduction

In 1766, Olfers described what would be named *H.diminuta* in rats from Rio de Janeiro (1). For the first time in 1819, Rudolphi provided the adequate description of the worms recovered from rats and mice. Weinland was given credit for describing the first human infection in a 19-month-old child in 1858(2). About 300 human infections have been described since the first description in 1989 (3).

Human infection with *H.diminuta* or the "rat tapeworm" results from accidental ingestion of insects (immature fleas, flour moths or beetles, meal worms, cockroaches) that harbor cysticercoid stage of the parasite in their body cavities. When rodents, or rarely, humans, consume infected insects, the larvae, mature within the small intestine into adult tapeworms. The potential life-span of this tapeworm was monitored in laboratory rats for 14 yr by 13 successive surgical transplantations. In the same study the author also experimented self-termination of *H.diminuta* on himself twice, one in five and the other in 7 wk after infection (4).

In a recent paper reporting the eighth human infections of *H.diminuta* in Spain, a summary of the prevalence of infection in different populations around the world ranged from 0.001% to 5.5% (5). The first human case of *H.diminuta* in *Iran* was reported in 1968, from Mashad area in the northeast of the country in a 10 yr old villager (6). As part of a parasite survey performed in 1972 in a rural area along the Persian Gulf in southern Iran, five cases of infection were found among 635 persons examined (7).These cases occurred in 4 children (9, 10, and 11 yr-old boys and a 6-yr-old girl) and 1 adult (a 65- yr- old male). The present case was observed in a 16 –month-old female infant whose family had moved to the capital few days prior to admission. The patient was referred to the Children's Medical Center affiliated to Tehran University of Medical Sciences in July 2007. The child had diarrhea of less than a month in duration, occasional vomiting and, the expelling of delicate white tapeworm segments from the anus. According to her father, the child showed signs of dizziness within the first few minutes after awakening. A submitted stool specimen contained two worms (one 112 mm long intact strobila and a strobila without a neck or scolex) and a few free segments with a

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maximum width of 3.2 mm. Microscopic examination of the stool revealed typical eggs of *H.diminuta* which were slightly ovoid, 62-87 micrometers in maximum diameter, with a thick yellow outer shell and a thin colorless inner membrane lacking polar filaments (Fig.1). The child was successfully treated with praziquantel (Cipla, India), administered in a single dose of 20 mg/kg body weight. The patient was followed up two months after therapy. The treatment was considered successful when neither eggs nor tapeworm segments were detected in the weekly stool examinations. It might be expected that in the case of *H.diminuta* where there is a worldwide distribution of the rat reservoir along with a potential vectors that human infections would be a more common occurrence .This may be especially true in areas with poor hygiene. The low frequency of *H.diminuta* infection in humans may be due to the natural immunity of the host .It is believed that the poorly adapted parasite is easily removed under most conditions (8, 9). It is also possible that a number of infections go undiagnosed or unrecognized by the person or family of the affected individual. Community-wide mass treatment in rural areas or presumptive therapies may also influence reports on *H.diminuta* occurrence in human populations. Amongst certain individuals in southeast Asia, there is a tendency to eat live beetles as a folk (10). Such behavior does not occur in Iran, so it is most likely that people are infected through the accidental ingestion of the infected insects in food in which the insects are feeding.

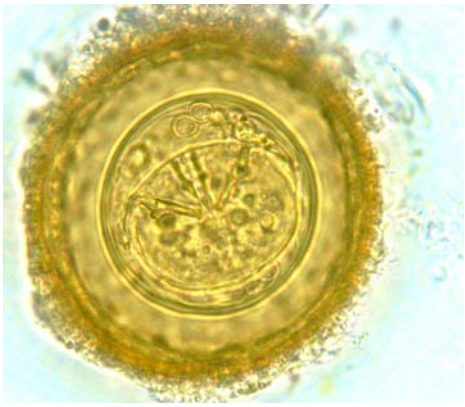

Fig. 1: Typical *H.diminuta* egg found in the patient's stool at X 100 magnification

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