

Study on Human Taeniasis by Administering Anti-*Taenia* Drug

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Abstract

Mazandaran province, northern Iran, has been an area with highest prevalence of infectivity with human taeniasis during past decades. In order to assess current situation of taeniasis in the province by a method which can yield a correct estimation of infection rate, this study was performed by administering anti-*Taenia* drug, during 2003-2004. A total of 417 people were randomly selected from rural areas of Mazandaran province. All of them were at first given a dose of niclosamide (2-4 500 mg tablets) and bisacodile (1-3 5 mg tablets); then their 36 h stool passage was collected and examined macroscopically and microscopically. The results revealed that 2 individuals (0.5%) were infected with *Taenia saginata*. Compared with previous decades, there is a sharp drop on human taeniasis in the study area. Infected peoples were followed up till complete treatment.

Keywords: *Taenia saginata*, Niclosamide, Bisacodile, Iran

Introduction

Taenia saginata and *T.solium* are two cyclophyllidean tapeworms of humans. Cattle and pigs are intermediate hosts for *T.saginata* and *T.solium*, respectively (1). Both species have cosmopolitan distribution, however in a given area, food habitat determines which of these two species to be dominant. In Iran, beef is frequently used by people and the most important source of teaniasis is the consumption of undercooked beef as "Kabab", a favorable dish. Previous studies concerning human taeniasis indicated that *T.saginata* had a distribution through whole the country. However, it was more prevalent in Mazandaran province (2), especially in rural areas where cattle breeding is common. In a study, 35% of residents of a village in Mazandaran discharged *Taenia* proglottids after administration of anti-*Taenia* drug (3). In order to estimate the current prevalence of

human taeniasis in this province, and to understand if the wide use of antihelminthic drugs for this parasite is still necessary, this study was undertaken. Since the diagnostic method in nearly all studies carried out on intestinal parasites in Iran, during recent years, is formalin-ether concentration (4- 7), which can not yield an accurate estimation of human taeniasis, and the use of coprological methods have not been yet established, the current study was performed using anti-*Taenia* drug under supervised conditions.

Materials and Methods

Study area Mazandaran Province with an area of 23756 Km² is situated in north of Iran, at the vicinity of Caspian Sea. It has a temperate climate and consists of mountainous and plateaus sections, and most parts of mountain-

ous area is used as pasture for breeding of cattle.

Sampling During 2003-2004, after obtaining ethical clearance from Research Affairs of Tehran University of Medical Sciences, Iran, using random stratified sampling, 20 villages of Mazadaran province were selected, and in each village at least 20 peoples who were more than 2 years old, non-pregnant or breast feeding, and without history of organic diseases especially liver and kidney disorders, were selected randomly. After, filling the questioner and signing the satisfaction form by every individual who attended to the study, under supervision of a physician, 4 tablets of niclosamid (500 mg) for adults and 2 tablets for children aged 2-12 years old were given to be chewed and swallowed by a full glass of water, accompanied by a dose of bisacodile (1-3 5 mg tablets). Later, 36 h stool passage of every individual was collected in a screw cap plastic container and transported to Babol Health Research Center, where macroscopical and microscopical examinations were performed. Formalin-ether concentration method was applied on all samples and then every stool container was poured on a sieve, washing under running tap water. The segments left on the sieve were removed, and after fixing in formalin and dehydrating in glycerol (8) examined under microscope. The results of examination, demographic and other questioners data were saved and analyzed by SPSS software. The infected people with *Taenia* were followed up after four months and their complete treatment were ensured.

Results

Macroscopical examination of stool samples for detection of *Taenia* proglottids and also microscopical examination, by formalin-ether concentration method for detection of *Taenia* eggs, (in case of proglottids rupture as an effect of niclosamide), revealed the infectivity of 2 individuals with *Taenia*, out of 417 people examined (0.5%). Table 1 shows the distribution of

people examined according to their sex and age. Children less than two years old and pregnant or breast feeding women were not included in this study. Overall, 185 males and 232 females were studied from 20 villages of Mazadaran province. The distribution of these people according to their literacy level is illustrated in Table 2. As this table shows the maximum percent (32.4%) and minimum percent (3.6%) are correspondence with primary level and higher than diploma level, respectively. As respect to infection rate, 2 of 417 people examined (0.5%), were found infected with *T.saginata*. Both patients used to consume beef as Kabab dish. One of them was a teenage boy who had symptoms of taeniasis. Second patient was a young single lady who refused to give information about her symptoms unless in presence of a female physician. This patient was deeply ashamed of involuntary proglottids discharge. Although both patients were aware of the crawling of proglottids from their anus, but did not know the reason. During microscopical examination of faecal samples by formaline-ether concentration method, intensive eggs of *Taenia* were visible due to rupture of proglottids as a result of niclosamide. As no scolex of *Taenia* was found in stool discharge of both patients, they were followed up after 4 months and by second prescription of niclosamide the parasite was eliminated. After complete cure, in both patients symptoms were improved; especially in teenage boy, who was suffering from weigh loss.

Table 1: Frequency and percent of people examined in the rural areas of Mazandaran province according to their literacy level

Sex \ Literacy level	Illiterate		Primary school		Secondary school		High school		Diploma		Higher than Diploma		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Female	63	27.1	74	31.9	44	19	20	8.6	25	10.8	6	2.6	232	100
Male	33	17.8	61	33	47	25.4	20	10.8	15	8.1	9	4.9	185	100
Total	96	23	135	32.4	91	21.8	40	9.6	40	9.6	15	3.6	417	100

Table 2: Frequency and percent of people examined in the rural areas of Mazandaran province according to their age

Sex \ Age-groups (Yr)	2-9		10-19		20-29		30-39		40-49		>50		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Female	27	11.6	73	31.5	45	19.4	33	14.2	32	13.8	22	9.5	232	100
Male	26	14.1	64	34.6	31	11.3	27	14.6	18	9.7	29	15.7	185	100
Total	53	12.7	137	32.9	66	15.8	60	14.4	50	12	51	12.2	417	100

Discussion

T. saginata is still a public health challenge in developing countries. Due to difficulties in diagnosis of infection and absence of symptoms in healthy carriers (9), the infection may rarely become health threatening. The gravid proglottids of the strobila, which are filled by *Taenia* eggs, may lodge to unusual sites like appendiceal lumen (10) and initiate inflammation. To prevent such difficult consequences, the early diagnosis and treatment of infected people is necessary. However symptomology in *Taenia* is vague (8), and perianal swab method is not applicable in Iran (3). Formalin-ether concentration method, which is the most frequent technique used for diagnosis of intestinal helminths in Iran, is not specific for diagnosis of taeniasis (9). Therefore, in the present study, treatment of people by anti-*Taenia* drug was used in rural areas of Mazandaran province to obtain an accurate estimation of taeniasis and to understand

if the wide use of anti-*Taenia* drugs was still necessary. According to the results, 2 of 417 people (0.5%) were found infected with *T. saginata*. However, in 1959 the prevalence of this infection in the province was the highest in the country (17%) (2), and during a study on taeniasis, 35% of residents of a village expelled *Taenia* proglottids after taking anti-*Taenia* drug (3). Therefore, there is a sharp drop on the prevalence of human taeniasis in Mazandaran compared with previous decades.

Although both patients of the present study were aware of proglottids discharge, but they did not have knowledge about their infection with *T.saginata*. Moreover, crawling of proglottids from the anus was very embarrassment especially for the female patient who stated her symptoms only for a female physician.

As the crawling of proglottids from the anus is one of the most important clue for detecting taeniasis, therefore, health education and en-

sure people for declaring their symptoms will be helpful for finding infected individuals. This issue is also important for administration of antiparasitic drugs. The increasing number of reports on drug resistance to praziquantel and other antiparasitic drugs in wide use (8) requires that only individually diagnosed cases of taeniasis take antihelminthic compounds and current wide use of such drugs in primary health care units needs to be limited.

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