

PREVALENCE OF INTESTINAL HELMINTHIASIS AMONG SETTLED NOMADS AND THOSE WITH MOVING HABITS IN SOUTHERN IRAN*

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ABSTRACT

The prevalence of various intestinal helminthiases among the inhabitants of 7 villages was compared with that among the nomadic Bakhtiari tribe with its migratory habits.

Stool examination of 736 nomads and 784 persons of the same ethnic group settled in 7 villages showed that, among the settled population, the prevalence of infection with *Ascaris*, *Trichostrongylus* spp., *Trichuris trichiura*, *Hymenolepis nana*, *Taenia soginata* and *Enterobius vermicularis* was 42.3%, 14%, 3.9%, 5.4%, 1%, and 6%, respectively. The prevalence of infection with the above-mentioned helminths among the tribe with migratory habits was respectively 9.2%, 86.9%, 0.5%, 4.7%, 0.5%, 1%.

The species of *Trichostrongylus* found among the inhabitants of the villages were in order of frequency, *orientalis*, *colubriiformis*, *axei*, *vitrinus* and *capricola*, while the species expelled by nomadic patients after treatment were, in order of frequency, *T. colubriiformis*, *T. orientalis*, *T. axei*, *T. capricola* and *T. vitrinus*.

The reasons for differences observed in the prevalences of some helminths among the two groups were discussed.

INTRODUCTION

The prevalence and intensity of various intestinal helminthiases in different

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parts of southern Iran have been determined in previous papers. (1-3).

In this paper, the prevalences of intestinal helminths among two groups of nomadic tribes, one with migratory habits and the other settled in villages, are indicated and compared.

MATERIALS AND METHODS

The Bakhtiari tribes are nomads with migratory habits, living southwest of the Zagros Mountains in the South of Iran. The total number of Bakhtiari people has been estimated to be about 120,000, who live in small tents of goat hair. During the summer they live in the southern part of Isfahan province, migrating south during the winter to the Khuzestan area.

Their migration to the south begins in early fall and they return to the north each April. Each migration lasts about one month.

There is usually one tent for each family and, in most cases, domestic animals are kept in the same tent.

Stool samples collected from 736 nomads of the Bakhtiari tribe, who spend their summers in the mountainous areas of Kouhrang and migrate to Khuzestan, southwestern Iran, in the winter, were examined using direct smear and flotation methods. In addition, stool examinations using the same methods were performed for 784 persons of the Bakhtiari tribe who are settled since more than 30 years ago, in 7 villages in the Kouhrang mountains and who do not have migratory habits.

In order to identify the species of *Trichostrongylus* infecting the people examined, 40 persons from the first group and 40 infected people from the second group were treated with Bephenium hydroxynaphthoate (Alcopar). The stools of all treated people were collected up to 48 hours after drug administration, the worms expelled were examined and the species of *Trichostrongylus* found were identified.

RESULTS

A. Settled Population

The prevalence of infection with various intestinal helminths among both sexes of the tribes settled in 7 villages is shown in Table 1. As indicated in this table, the highest prevalence of ascariasis (66.4%) was found in the village of Deh Now Olia and the mean infection rate among the total population was 42.3%.

The second important helminthiasis, as regards the percentage of people infected, was trichostrongyliasis, the prevalence of which reached to 21.5% in the village of Mian Roudan and the total prevalence for all villages visited was 14%. The prevalence of *Trichuris trichiura* and *Hymenolepis nana*, on the

other hand, was rather low.

The prevalence of infection among various age groups of the inhabitants of the 7 villages is summarized in Table 2.

The overall prevalence of infection for *Taenia saginata* and *Enterobius vermicularis* (by stool examination only) was 1% and 6.1% respectively.

Of 784 persons examined, 409 or 52% were found infected with one or more parasites, of which 290 or 52.9% were infected with one, 99 or 12.6% with two and 3 or 0.4% with 3 helminths. The species of *Trichostrongylus* found among 40 cases treated in the 7 villages were *T. orientalis* (found among all 40 cases treated), *T. colubriformis* (found among 7), *T. axei* (found among 4), *T. vitrinus* (found among 3) and *T. capricola*, which was found in one treated case only.

The minimum worm burden for *Trichostrongylus* among these 40 treated cases was 2, the maximum 77 and the average 21.9.

B. Nomadic Tribes

Prevalences of infection with *Ascaris*, *Trichostrongylus* and *H. nana* among various age groups of the nomadic tribe are shown in Table 3. As indicated in this table, the overall prevalence of infection with the 3 above-mentioned helminths was 9.2%, 86.9% and 4.7% respectively.

Trichuris trichiura, *Enterobius vermicularis* and *Taenia saginata* were found with low infection rates (0.5%, 1% and 0.25% respectively).

Of 736 people examined, 657 or 89.2% were found infected with one or more parasites, of which 576 (78.2%) were infected with one, 76 (10.3%) with two and 3 (0.4%) with 3 helminths.

The species of *Trichostrongylus* expelled by treated cases among 40 persons of the nomadic tribe, in order of their frequency, were *T. colubriformis*, *T. orientalis*, *T. axei*, *T. capricola* and *T. vitrinus*.

DISCUSSION AND CONCLUSION

A comparison made between the prevalence of helminthiasis among nomads with and nomads without migratory habits indicates some very interesting results. The prevalence of *Ascaris*, while very high among the settled population, is considerably lower among nomads who migrate to various places. The reverse is true for infection with *Trichostrongylus*, which is high among nomads who migrate and low among the settled population. The difference observed in the prevalence of these two helminths among the two groups can easily be explained when one considers the fact that the main source of transmission of ascariasis infection is the soil, and its contamination with the ova of the parasite increases with the settlement of the population; whereas for *Trichostrongylus* sp., the main source of infection is domestic animals and their close contact with man, as is found among nomads who live in the same tents with their animals during migration.

TABLE 1

Prevalence of intestinal helminthiasis among both sexes of the inhabitants of 7 villages in Kouhrang (1973)

Name of Village	Number Examined			Percent found infected with:											
				A. lumbricoides				Trichostrongylus				T. trichiura			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Qaleh Margh	64	61	125	50.8	57.8	53.6	13	15.6	14.5	1.6	3.1	2.4	6.5	3	4.8
Fani Abad	56	44	100	32.1	29.5	31	8.9	27.2	17	1.7	2.2	2	10.7	4.4	8
Daymeh	67	68	135	34.3	54.4	44.4	5.9	23.5	14.8	10.4	4.4	7.4	5.9	2.9	4.4
Deh Now Ollia	88	82	170	64.7	68.2	66.4	13.6	9.7	11.7	5.6	6	5.8	2.2	6	4.1
Ali Kasseh	64	56	120	20.3	33.9	26.6	10.9	7.1	9.1	1.5	---	0.8	10.9	10.7	10.8
Mian Roudan	37	28	65	27	25	26.1	27	14.2	21.5	7.1	---	3	2.7	3.5	3
Qaleh Sabsi	28	41	69	17.8	17	17.3	10.7	7.3	8.6	3.5	2.4	2.8	3.5	2.4	2.8
Total	401	383	784	38.9	45.9	42.3	12	15.2	14	4.7	3	3.9	6.2	4.9	5.4

It is interesting to note that the same situation, i.e. a high prevalence of *Trichostrongylus* spp. versus low infection with *Ascaris*, has also been found among the nomadic tribes of Fars. (3)

Another interesting finding is human infection with *T. capricola*, which has never before been reported from any other infested area of the world.

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TABLE 2

Prevalence of Some intestinal helminthiases
in various age groups among the inhabitants of
7 villages in Kouhrang (1973)

Age Group	Number Examined	Percent infected with:			
		<i>Ascaris</i>	<i>Trichostrongylus</i>	<i>T. trichiura</i>	<i>H. nana</i>
below 5	114	35.9	4.4	2.6	7
5-9	137	43.	10.2	1.4	8.7
10-14	130	52.3	13.	3.8	7.6
15-19	64	43.7	21.8	4.6	9.3
20-29	95	37.8	17.8	9.4	3.1
40-49	149	44.9	16.1	5.3	1.3
50+	95	34.7	14.7	1.	3.1
Total	784	42.3	13.5	3.9	5.6

TABLE 3

Prevalence of some intestinal helminths among various age groups of the nomadic Bakhtiari tribe

Age Group	Number Examined	Percent infected with:		
		Ascaris	Trichos- trongylus	<u>H.</u> <u>nana</u>
below 5	96	2	68.7	4.1
5-9	126	11.1	88.8	12.6
10-14	100	6.	90.	6.
15-19	64	12.5	87.5	3.1
20-29	114	12.2	91.2	1.7
30-49	148	8.1	91.8	2
50+	88	13.6	86.3	2.2
Total	736	9.2	86.9	4.7