

STUDIES ON INTESTINAL HELMINTHIASIS
IN GONBAD KAVUS AREA,
NORTH-EAST OF THE CASPIAN LITTORAL

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ABSTRACT

Prevalence of various intestinal helminthiasis has been established among the population of 42 villages in Gonbad Kavus in the north-east of the Caspian Littoral during a longitudinal health survey undertaken in this area.

Stool examination by formaline ether technique has been performed among 1240 randomly selected population.

Surprisingly and contrary to most other areas in Iran, very low infection rate with *Ascaris* (0.2%), *Trichostrongylus* (1.2%), hookworm (2.4%) and *Trichuris* (0.2%) were found among the population.

Prevalence of infection with *Hymenolepis nana* was rather high (overall prevalence of 12.5%). Significant variation has only been observed in the prevalence of *Hymenolepis nana* in various age groups.

Simultaneous infection with two or more helminths has been found in 16.5% of people and 9.6% were infected with one worm.

Infection with all helminths except *Hymenolepis* was very low in 20 villages where 20 or more people were examined.

Strongyloides stercoralis with a maximum rate of infection of 4% was found among the population of 5 out of 20 villages. *Dicrocoelium dendriticum* was also found in 7 persons.

Reasons for low prevalence of helminthiasis and its reverse correlation with the high incidence of oesophageal cancer in that area has been discussed.

INTRODUCTION

Human infection with intestinal helminthiasis, particularly soil

transmitted helminths is very high in most parts of Iran and helminthiasis constitutes one of the important public health problems, especially in rural areas.⁽¹⁾

To clarify the exact prevalence of helminthiasis in Iran, data on these infections has been collected in the course of longitudinal health surveys carried out by the Institute of Public Health Research in various parts of the country.

MATERIAL AND METHODS

In a Health Survey underway in Gonbad Kavus area in the Province of Mazandaran, North-East of the Caspian Littoral, randomly selected inhabitants of 42 randomly selected villages and agricultural establishments with a total population of 11,158 (5,844 males and 5,314 females) were examined. Stool samples were examined from a total of 1,240 persons of 42 villages, using formaline ether and flotation techniques.

The majority of these villages have no sanitation facilities and the socio-economic status of the population is not satisfactory.

RESULTS OBTAINED

Prevalence of various infections among 1,240 persons examined in 42 villages is shown in Table 1.

As shown in this table, prevalence of various intestinal helminthiasis is extremely low in the areas surveyed. The highest rate of infection is observed for *Hymenolepis nana*.

Infection rates with various helminths do not significantly differ in the two sexes.

Of 1,240 persons examined 215 or 16.5% were infected with one or more worms of whom, 119 or 9.6% were infected with 1, and 6 persons (0.5%) with 2 helminths.

Per cent infected with one and two worms was 17.1 and 0.5% among males and 0.15 and 0.5 among females respectively.

Variations in the prevalence in various age groups are shown in Table 2.

These variations are insignificant for all helminths except *Hymenolepis* in which the maximum prevalence is found in the age group 1-4, and it gradually decreases as the age increases.

Prevalences of infections with various helminths were established in 20 villages where at least 20 persons were examined.

A total number of 1,061 persons were examined in these villages. *Ascaris* with a rate of infection of 3.3% was present in only one village. *Trichostrongylus* was infecting the population of 7 villages

with an overall prevalence of 7.8% in one village. *Trichuris* has been found in 3 villages with an overall prevalence of 0.003 and a maximum of 3%. Hookworm infection has been observed in 8 villages with an overall infection rate of 1.9% and maximum rate of 10.8%. Infection with *H. nana* has been observed among the population of all villages except one with an overall infection of 12.1% and a range of 2.7 to 19%.

Strongyloides stercoralis is found among population of 5 out of 20 villages and the maximum rate of infection is 4%. Prevalence is higher among males and the maximum was 7% found among males in one village.

Infection with *Dicrocoelium dendriticum* is found among 7 persons which is rather high comparing with other parts of the country.

DISCUSSION

Comparing with the high prevalence of intestinal helminthiasis reported from other parts of Iran (4, 5, 6, 7), very low infection rate in areas surveyed is of great importance.

Previous studies have shown that the mean prevalence of ascariasis in villages of Isfahan, Khuzestan, Tabriz, Mashad and even the city of Kermanshah were 91, 64, 74, 81 and 74% respectively (3, 4, 5, 6). In most of these areas infection with *Trichuris* and *Trichostrongylus* spp. was also very high.

Considering the fact that the sanitation and socio-economic status of the population of Gonbad is similar to other parts of the country, the reason(s) for this very low infestation with parasites is not clear.

One important reason might be the habit of the farmers in this area not using night-soil as fertilizer which is commonly used in other parts of the country.

Very low consumption of vegetables in this area, found during a large scale nutritional survey during the study in the etiology of oesophageal cancer in this area (8) might be another important factor. More studies to determine other reasons are desirable.

Studies are also needed to determine the species of hookworm which is *Necator americanus* in adjacent areas (7) and *Trichostrongylus*.

The most striking result of this survey is the possible reverse correlation between infection with parasites and incidence of various cancers.

Thorough surveys undertaken in the Caspian Littoral in recent years have indicated that the incidence of cancer of the oesophagus in Gonbad is one of the highest in the world but it is several times lower some 50 kilometers to the west where the prevalence of infection with parasites is much higher. (8, 9).

The reverse correlation between infection with protozoa and

helminths and formation of malignant tumors has been shown by several workers (10, 11, 12, 13, 14).

More thorough epidemiological studies are needed to prove the existence of such an important correlation in the Gonbad area.

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Table 1
Prevalence of intestinal helminthiasis among the population of 42 villages surveyed in Gonbad Kavus (1975)

No. Examined	Per cent infected with						
	Ascaris	Trichostrongylus	Trichuris	Hookworm	Strongyloides	Hymenolepis	Dicrocoelium
Male	0.3	1.4	0.3	0.2	0.5	12.3	0.2
Female	0	0.1	0.2	2.7	0.3	12.7	0.1
Total	0.2	1.2	0.2	2.4	0.4	12.5	0.1

Table 2
Prevalence with intestinal helminths in various age groups among the population examined in 42 villages of Gonbad Kavus (1976)

Age group	No. examined	Per cent infected with					
		Ascaris	Trichostrongylus	Trichuris	Hookworm	H. nana	
0-4	11	0	0	0	0	45	
5-9	237	0	2.5	0	3.7	32.9	
10-14	204	0.5	0.1	0.5	2.4	25.5	
15-19	149	0	0.7	0.7	2.0	8.7	
20-39	351	0.3	1.4	0.3	2.6	2.3	
40 and over	288	0	0.4	0	1.4	0	
Total	1240	0.2	1.2	0.2	2.4	12.6	