

STUDIES ON INTESTINAL HELMINTHIASIS IN THE SOUTH OF IRAN III. ZAHEDAN*

E. Ghadirian

F. Arfaa

Gh. Missaghian

K. Keshavarz**

ABSTRACT Stool examinations of 402 inhabitants of 8 villages in and around an area near Zahedan, and 280 people who had immigrated from the rural area of Zabol, revealed the following:

The prevalence of infection with *Ascaris*, *Trichuris* and *Trichostrongylus* was very low (less than 5%) in all areas surveyed, while the mean infection rates found for *H. nana*, hookworm and *E. vermicularis* (by stool examination only) were respectively 25.6%, 1.4% and 8% for villages in Zahedan and respectively 20.8%, 26% and 12% for the rural area of Zabol.

The mean number of eggs of parasites found per gram of faeces was 400 for *Ascaris* and 1163 for hookworm. The only species of hookworm found was *Ancylostoma duodenale*, the mean worm burden of which was 18 among 20 cases treated.

The species of *Trichostrongylus* expelled from treated cases were *T. orientalis*, *T. colubriformis* and *T. vitrinus*. The mean worm burden of this parasite was 11.

Ninety percent of treated cases expelled *E. vermicularis*.

* This study was supported in part by the funds of the School of Public Health and Institute of Public Health Research, University of Teheran, and partly by the Public Health Research Project of the Ministry of Health and Plan Organization.

** Helminthology Section, Department of Epidemiology and Pathobiology, School of Public Health and Institute of Public Health Research, University of Teheran, P.O. Box 1310, Teheran, Iran.

INTRODUCTION The results of studies undertaken on the prevalence and intensity of various intestinal helminthiases in Bandar Abbas, Minab, Kazeroun, Borazjan and Bandar Bushehr have already been reported in previous papers. (1,2).

The results of a limited survey among the inhabitants of areas in Zahedan, southeastern Iran, are presented in this paper.

MATERIAL AND METHOD Stool samples from the populations of the following areas were collected and examined :

1. from among 402 people (236 males and 166 females) of 8 villages, randomly selected from 138 villages in this area, located in the vicinity of Zahedan city and the Nosrat Abad district;
2. from among 280 persons (139 males and 141 females) who had emigrated about two years ago from the rural areas of Zabol, 216 km to the north, to the city of Zahedan.

To find the prevalence of each parasite, stool samples were examined using the Willis flotation method. The intensity of infection of *Ascaris*, *Trichuris* and hookworm was indicated by egg count using the Stoll method, and *Trichostrongylus* ova were counted on slides prepared by the flotation technique.

Twenty patients who had migrated from Zabol villages and were infected with hookworm, of which 5 were also infected with *Trichostrongylus*, were treated with Pyrantel Pamoate in single doses of 20 mg/kg body weight. All worms expelled for 48 hours were collected, identified and counted.

RESULTS Of the intestinal helminths found among the inhabitants examined, the prevalence of infection with *Ascaris*, *Trichuris* and *Trichostrongylus* was very low (less than 5%) in all localities. The highest prevalence of infection was for *H. nana*, followed by *Enterobius* and hookworm.

The prevalences of infection with hookworm and *H. nana* in each locality are shown in Table 1. In Table 2, the prevalences of infection with hookworm and *H. nana*, which were more prevalent than other helminths, are shown for various age groups in the inhabitants of villages around Zahedan and among the Zabol people who had migrated to villages near Zahedan. As shown in this table, the highest rates of infection with *H. nana* were found among age group 0-14 in both areas, while for hookworm the highest rate, which was 42%, was found in 10-14-year old children from the Zabol area.

Prevalences of infection with hookworm and *H. nana* among both sexes in both areas are shown in Table 3. As shown in this

table, the prevalences for both of these infections do not change significantly among the two sexes in the 8 villages of Zahedan. The difference observed in the prevalence of *H. nana* in the two sexes among the people from Zabol is also not statistically significant.

Of 123 persons found infected with helminth parasites in the villages of Zahedan, 110 or 89% had only one species and 13 (10.5%) were harboring 2 species. The figures for the people from Zabol were as follows: of 126 positive cases in this area, 85 or 67.4% had one species, 36 or 28.5% were harboring two species and 5 (4%) had 3 species.

The mean number of eggs of hookworm per gram of faeces found among 10 patients from the villages of Zahedan was 140. The mean number of eggs of *Ascaris* per gram of faeces found among 60 people from Zabol examined by the Stoll method was 400 with a minimum of 200 and a maximum of 600. The mean number of ova of hookworm found was 1163 with a minimum of 50 and a maximum of 11,800 eggs/gr of faeces.

From 20 treated cases, the worms collected included 388 *Ancylostoma duodenale* (mean worm burden of 18) and 36 *Trichostrongylus*, which were identified as *T. orientalis*, *T. colubri-formis* and *T. vitrius*. The average worm burden for this species was 11.

It is interesting to note that after the treatment of these 20 patients, 18 or 90% expelled *Enterobius vermicularis* with an average of 366 worms per person.

DISCUSSION The reason(s) for such a low infection rate for some soil-transmitted helminths such as *Ascaris* and *Trichuris* in the areas surveyed, in spite of the lack of sanitary conditions, is not clear. The same situation has also been found in neighboring areas. (1,2).

The type of soil and the habits of the population may play some part in reducing the prevalence of these infections. The inhabitants of villages in this area are nomadic, moving north during the hot seasons. Thus infestation of the soil, which is the main source of transmission of *Ascaris*, seems to be much lower in these villages than in villages where the population is permanently settled. Also, the inhabitants of these villages do not use night-soil for fertilizer and very seldom eat vegetables.

As indicated in the tables, the prevalence of hookworm is higher among the Zabol immigrants. Thus it is not surprising that Farhang Azad *et al.* (1967) and Sahba *et al.* (1970) found higher rates of infection with this parasite in the areas around Zabol.

One interesting finding during the present survey was the comparatively high prevalence of contagious helminthiases, i.e. *H. nana* and *E. vermicularis*. The exact explanation of this finding is also lacking. Further investigations are needed in order to shed some lights on these obscure points.

ACKNOWLEDGE-MENT The authors are highly indebted to Dr. M.A. Faghil, Dean of the School of Public Health and Director of the Institute of Public Health Research, for his kind suggestions, and to Dr. Haghghat, General Director of the Department of Public Health of the province, Dr. Baharloo, Head of the Malaria Eradication Organization, and Dr. Faegh, Chief of the Public Health Laboratory of the province, for their help in providing the facilities needed during this survey.

Our thanks are also due to Mr. H. Bahrani, Technician at the Isfahan Research Station, for his assistance during these studies.

REFERENCES

1. Ghadirian, E., Arfaa, F. and Yossefi, A. (1972a). Studies on intestinal helminthiases in the south of Iran. I The Bandar Abbas and Minab areas. *Ir. J. Pub. Hlth.* 1(2) : 50-59.
2. Ghadirian, E. and Missaghian, GH. (1972). Studies on intestinal helminthiasis in the south of Iran. II. The areas of Kazeroun, Borazjan and Bandar Bushehr. *Ir. J. Pub. Hlth.* 1(3):126-137.
3. Parvaz, P. and Farhang Azad, A. (1967). Studies on intestinal helminthiasis in Sistan province. Research paper No. 6 of the Health Corps in Sistan.
4. Sahba, G.H., Arfaa, F. and Rastegar, R. (1970). Human infection with *Moniliformis dubius* (Achantocephala) (Meyer 1932) (Syn. *M. moniliformis* (Bremser 1811) (Travassos 1915) in Iran. *Trans. Roy. Soc. Trop. Med. Hyg.* 64.

TABLE 1

Prevalence of infection with Hookworm and H. nana
in various villages around Zahedan (March 1973)

Name of Locality	Percent Infected with:	
	Hookworm	<u>H. nana</u>
1. Hormak	3.7	22.2
2. Ghargharook	2.5	23
3. Mohamad-Abad	0	15.3
4. Katchah-Rood	0	16.6
5. Lar Pain	2	39
6. Hajiabad	0	56.2
7. Hemat-Abad	0	9.6
8. Said-Abad	0	18
TOTAL	1.4	25.6

TABLE 2

Prevalence of infection with Hookworm and H. nana among the inhabitants of villages of Zahedan and immigrants from Zabol (March 1973)

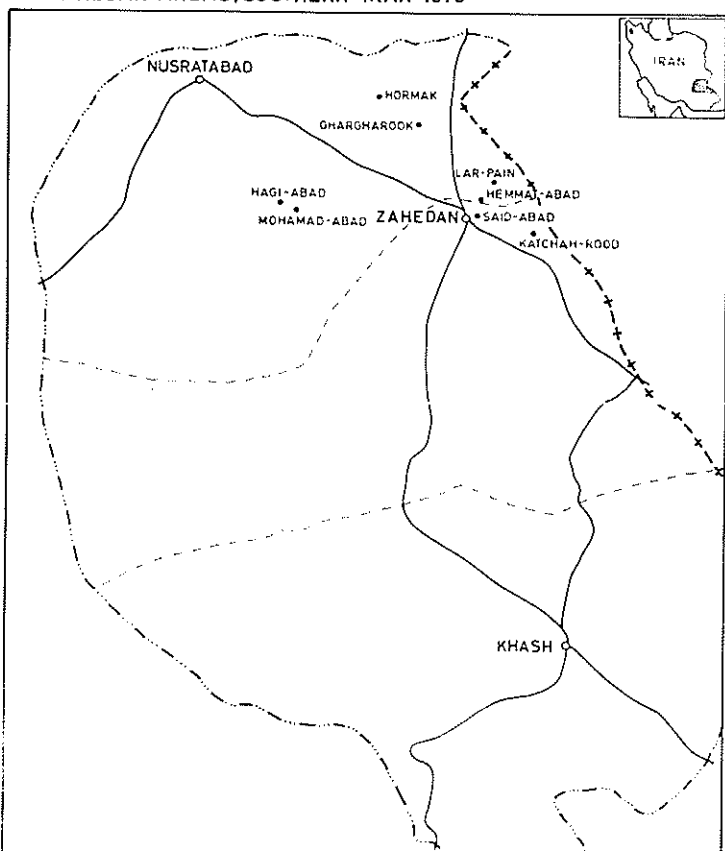
Age Group	Villages of Zahedan % Infected with:		Zaboli Immigrants % Infected with:	
	Hookworm	<u>H. nana</u>	Hookworm	<u>H. nana</u>
Below 5	0	35.2	0.8	22.8
5-9	3.7	34.5	29.6	46.
10-14	1.3	31.9	42.	23.6
15-19	0	16.	26.3	21.
20-39	0	14.	30.5	7.
40-49	2.	9.	23.	3.
50 +	0	5.5	22.	11.
TOTAL	1.4	25.6	26.	20.6

TABLE 3

Prevalence of Hookworm and H. nana among
the two sexes in 8 villages around Zahedan and
immigrants from Zabol (March 1973)

Sex	No. Exam.	Villages of Zahedan % Infected with:		No. Exam.	Zaboli Immigrants % Infected with:	
		Hookworm	<u>H. nana</u>		Hookworm	<u>H. nana</u>
M	166	1.6	26.1	139	27.1	23.
F	236	1.2	25.1	141	25.	18.
TOTAL	402	1.4	25.6	280	26.	20.7

VILLAGES SURVEYED FOR INTESTINAL HELMINTHIASIS IN
ZAHEDAN AREAS, SOUTHERN IRAN 1973



SOCIAL AND CULTURAL PROBLEMS IN PUBLIC HEALTH WORK

M. Sorya

Summary

Each community, due to differences in climatical, social economical and cultural peculiarities has a different sort of public health problem. In planning and executing

public health programs, health workers should first be concerned with the problems of the locality and then with the program.