

Incidence of Intestinal Helminth Parasites of Man in the Twin Cities of Rawalpindi - Islamabad.

Pages with reference to book, From 33 To 38

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Abstract

A total of 8850 stool samples (Rawalpindi = 5360 and Islamabad = 3490) from seven hospitals of the twin cities of Rawalpindi-Islamabad were examined for intestinal helminths during September 1980 to September 1981 and the following parasites were recorded: *Taenia saginata*, *Hymenolepis nana*, *Ascaris lumbricoides*, *Enterobius vermicularis*, *Trichuris trichiura*, and *Hookworm*. Of the total cases examined 43.90% from Rawalpindi and 30.34% from Islamabad carried helminthic infection. In both the cities *T. saginata* had a very low incidence. Sex did not seem to play a role in the distribution of these parasites, and children had a higher incidence of infection than individuals in other age groups. It was noted that poor hygienic condition of the individuals, malnutrition, heavy faecal pollution of the premises, and large size of the family are mainly responsible for maximum infection of these parasites. In general helminthic parasitosis was higher in Rawalpindi than in Islamabad (JPMA 33:33, 1983).

Introduction

Parasitic diseases constitute one of the major public health problems in the world. Incidence of intestinal parasitism is of paramount importance especially in the developing countries because of its direct contribution to malnutrition. The importance of the diseases due to intestinal parasitism is immense as they are unremittingly corrosive constituting a steady drain on the vitality of the host. Many descriptions regarding the incidence of intestinal parasites among human beings in various countries of the world are available (Kuntz and Moore, 1971; Biswas et al., 1978; Akinkugbe, 1980). In Pakistan, too, various surveys have been conducted in different areas (Saleem, 1961; Farooki, 1964; Ansari et al., 1968; Siddiqui and Bano, 1979) but little attention had been paid in this regard to the twin cities of Rawalpindi-Islamabad except for one report (Pal and Malik, 1979) which was on the incidence of intestinal parasites in the primary school children of Islamabad. These twin cities, although 12 Km apart show a wide range of difference in the education rate, socio-economic conditions and hygienic and sanitary facilities available to their inhabitants. It was, therefore, thought interesting and appropriate to study the incidence of intestinal parasites in the populations of these cities and to note the differences, if any. The present report deals with the infection of intestinal helminth parasites while protozoan parasitosis will be given in another communication.

Material and Methods

All stool specimens received for examination in seven hospitals of Rawalpindi and Islamabad over a period of 12 months i.e. September 1980 to September 1981 were checked in the present investigation for helminth parasites. This study involved a total of 5360 patients (females: 2450, males: 2910) from Rawalpindi and 3490 cases (females: 1690, males: 1800) from Islamabad. Each patient was asked to collect morning stool in a pill box, bearing name and age of the individual. The stool specimens were collected between 0700 and 0800 hours and were examined in the hospital laboratories within one hour of their collection. At the time of stool collection each patient was asked to fill in a questionnaire requiring the following information: (1) list of all members of the family with sex and age, (2)

observations on the faecal pollution of the premises, and its disposal, (3) size and condition of the house, (4) observations on the personal cleanliness of the individual, (5) physical condition of the patient, and (6) the type of drinking water source.

The stool samples were examined by direct smear method in normal saline and zinc sulphate floatation technique was also applied. One stool specimen was examined in each case. Microscopic examination conducted for at least 5 minutes per sample. Ova were examined under 10 x objective lens.

RESULTS

Of the total patients examined 43.90% from Rawalpindi and 30.34% from Islamabad were found infected with helminths. Frequencies of specific infections are given in Table I.

Table I. Frequencies of specific infections

Helminths	Rawalpindi(%)	Islamabad(%)
T. saginata	1.28	0.42
H. nana	8.82	16.41
A. lumbricoides	15.55	5.84
E. Vermicularis	4.72	4.64
T. trichiura	2.83	1.74
Hook Worm	9.86	1.26

Table II
Prevalence (% infection) of Intestinal Helminths Parasites by Sex in Rawalpindi and Islamabad

	RAWALPINDI		ISLAMABAD	
	Male	Female	Male	Female
T. saginata	1.54	0.94	0.50	0.35
H. nana	9.69	7.79	16.77	16.03
A. lumbricoides	14.46	16.85	5.44	6.27
E. vermicularis	4.19	5.34	4.66	4.61
T. trichiura	2.40	3.34	1.77	1.71
Hookworm	10.10	9.59	1.33	1.18

Table II shows the prevalence of intestinal helminth parasites according to sex in Rawalpindi and Islamabad. In the former city 42.38% males and 43.88% females were found positive for helminths. The parasites showed minor degrees of differences in the two sexes. In Islamabad males and females showed 30.30% and 30.17% helminthic infection respectively. Sex had little influence in the distribution of helminths in this city.

Table III shows the occurrence of intestinal helminths in different age groups of Rawalpindi and Islamabad. In the former city *A. lumbricoides* was the dominant pathogenic parasite varying in incidence from 3.09% in the 5-9 year age group to 0.52% in the 60 years and above age group. In Islamabad *H. nana* proved to be the most common parasite with highest incidence (3.49%) in the 5-9 year age group. In both the cities *T. saginata* was the least common parasite having a very low rate of infection in the different age groups and with a higher percentage of infection in Rawalpindi than in Islamabad. Difference of infection between the populations of the twin cities could be due to the fact that in Islamabad

Table IV.
Incidence of (% infection) of Helminth Parasite Compared with Environmental Conditions in Rawalpindi

	Number of Individuals	<i>T. saginata</i>	<i>H. nana</i>	<i>A. lumbricoides</i>	<i>E. vermicularis</i>	<i>T. trichiura</i>	Hook worms
Faecal pollution of premises							
Low	1470	1.08	6.87	13.80	4.42	2.38	6.66
Moderate	2085	1.19	7.67	15.10	4.89	2.97	8.44
Heavy	1805	1.27	10.24	17.50	4.76	3.04	14.12
Faecal disposal							
Sanitary privy	3410	1.29	8.15	15.36	4.25	2.69	9.35
Unsanitary	1250	1.20	9.60	15.44	4.96	2.96	9.60
No facility	700	1.42	10.70	16.71	5.14	3.28	12.85
Drainage							
Open	3410	1.23	10.11	16.71	5.33	3.04	10.17
Underground	1950	1.38	6.56	13.53	3.64	2.46	9.33
Domestic refuse							
Bins	2224	1.21	7.10	13.89	4.36	2.74	8.67
Open	3136	1.33	10.04	16.74	4.97	2.90	10.71
Water supply							
Tap water	4728	1.07	8.60	15.05	4.75	2.83	10.15
Hand pump	342	1.46	11.11	12.28	5.26	3.21	7.01
Wells	190	1.57	14.37	22.10	5.26	3.68	13.15
Personal cleanliness							
Good	920	1.30	8.15	9.23	4.67	2.39	8.47
Satisfactory	1980	1.16	9.04	15.20	4.79	2.87	9.59
Poor	2560	1.38	10.32	18.21	5.60	2.96	10.60
Physical conditions							
Well nourished	1685	0.59	7.24	14.24	3.44	2.01	7.71
Under nourished	1882	1.43	9.13	15.30	5.26	3.18	9.03
Mal-nourished	1793	1.78	9.98	17.06	5.35	3.23	12.77
Family size							
1-3	1040	1.34	8.17	14.71	3.84	2.21	8.07
4-6	1375	1.30	8.72	14.98	4.87	2.69	9.81
7-9	1737	1.32	9.03	15.71	4.89	2.99	10.36
10+	1208	1.15	9.18	16.72	5.13	3.31	10.76

Table V
Incidence (% infection) of Helminthic Findings and Environmental Conditions in Islamabad

	Number of Individuals	T.saginata	H.nana	A.lumbrico- ides	E.vermicularis	T.trichiura	Hook worms
Faecal population of premises							
Low	3321	0.39	13.30	5.78	4.57	1.77	1.02
Moderate	100	1.00	18.00	6.00	5.00	1.00	4.00
Heavy	69	1.44	18.84	8.69	7.24	1.44	8.69
Faecal disposal							
Sanitary privy	3433	0.37	16.31	5.79	4.60	1.71	1.16
Unsanitary privy	35	2.85	20.00	8.57	5.71	2.85	2.85
No facility	22	4.54	27.27	9.09	9.09	4.54	4.54
Drainage							
Open	90	1.11	14.44	13.33	5.55	1.11	2.22
Underground	3400	0.41	16.47	5.64	4.61	1.76	1.23
Domestic refuge							
Bins	2580	0.42	16.20	5.96	4.53	1.70	1.20
Open	910	0.43	17.03	5.49	4.94	1.86	1.20
Water supply							
Tap water	3435	0.40	16.36	5.79	4.62	1.74	1.19
Hand pump	25	4.00	20.00	8.00	4.00	0.00	4.00
Well	30	0.00	20.00	10.00	6.66	3.33	6.66
Personal cleanliness							
Good	936	0.32	16.20	3.41	3.73	1.60	1.06
Satisfactory	1477	0.47	16.18	6.09	4.60	1.69	1.28
Poor	1077	0.46	17.08	7.61	5.47	1.94	1.39
Physical condition							
Well nourished	992	0.30	10.48	3.72	4.13	1.10	0.90
Under nourished	1360	0.44	17.72	5.25	4.77	1.69	1.17
Mal-nourished	1138	0.52	20.30	8.34	4.92	2.37	1.66
Family size							
1-3	950	0.42	12.63	4.00	2.42	1.68	0.84
4-6	1025	0.48	13.85	4.87	4.00	1.75	1.07
7-9	780	0.38	19.48	7.43	5.76	2.43	1.66
10+	735	0.40	21.63	7.89	7.21	2.44	1.63

Tables IV and V show correlation between parasitological findings and the environmental conditions of Rawalpindi and Islamabad respectively. In both the cases poor hygienic conditions of the individuals, malnutrition, heavy faecal pollution of the premises, and large size of the family were the factors responsible for maximum infection of these parasites.

Discussion

Two cestodes, *H.nana* and *T.saginata*, have been recorded from both the cities of which the former has shown higher incidence in Islamabad than in Rawalpindi. A similar high incidence for this cestode has already been reported from this city (Pal and Malik, 1979)⁹ This people are comparatively more affluent as a whole, and consume bakery products where grocery shops

have a fairly large murine population (Pal and Malik, 1979). On the other hand, *T. saginata* is rare in both cities but shows a higher incidence in Rawalpindi than in Islamabad. Earlier Pal and Malik (1979) were unable to record this parasite from the primary school children of Islamabad owing to a small sample size as compared to that in the present study. Although beef is thoroughly cooked in domestic preparations it appears that smoked beef which is only partially cooked is responsible for maintaining this low infection. Whereas its high rate of infection in Rawalpindi indicates that here people take more smoked beef than the residents of Islamabad. Ansari and Nasir (1956) conducted a survey of parasitic infections among the prisoners of Borstal Jail in Lahore and reported incidence of *T. solium*. It is likely that they have confused *T. solium* with *T. saginata*. The presence of *T. solium* is highly doubtful in Pakistan due to the fact that pigs being the intermediate host of this parasite are not sold or eaten according to religious beliefs.

Of the nematodes, *A. lumbricoides*, *T. trichiura* and Hookworm show a higher level of infection of these parasites are varied and have been discussed in an earlier publication (Pal and Malik, 1979). It appears that Islamabad inhabitants are comparatively more educated and aware of health hazards and enjoy better hygienic standards than the residents of Rawalpindi: *E. vermicularis* infection is almost similar in both the cities. Beck and Barret-Connor (1971) have stated that less than 5% of positive cases of *E. vermicularis* ever show eggs in the faeces. In the present study more than 4% cases have been recorded which indicates a very high incidence of this parasite. The eggs of this parasite are present on the hands, clothing, bed linen, towels, washclothes, soap, tooth brush, door knobs, and many other household articles but it appears that in Islamabad and Rawalpindi, infrequent changing of bed linen, sharing of beds and over-crowding of families also contribute towards its infection.

According to the present findings sex does not appear to play a major role in the distribution of helminthic infections in both the cities although minor differences between the sexes are noted here for the city of Rawalpindi which cannot be explained on the basis of existing data. However, it seems certain that members of both the sexes within the respective cities are equally exposed to these infections in spite of a comparable education and hygienic background. Generally higher incidences of *H. nana*, *A. lumbricoides*, *E. vermicularis*, *T. trichiura*, and hookworm in children has already been reported (Cameron, 1960; Beck and Barret-Connor, 1971).

A comparison of the present results with those available for other areas of Pakistan (Lahore: Ansari et al., 1968; Peshawar: Siddiqui and Bano, 1979; Karachi: Bilquees et al., 1982) reveals a greater incidence of helminth parasites in Rawalpindi except for *H. nana* infection which was higher in Lahore and Peshawar, whereas the incidence of *T. trichiura* was almost similar in Rawalpindi and Karachi. In general, helminthic parasitosis is comparatively higher in Rawalpindi than in Islamabad. Open drains, overflowing sewerage pipes, narrow dirty lanes, old fashioned dark houses and unplanned new colonies around this city are mainly responsible for the high rate of infection. It is evident that the inhabitants are living in poor hygienic conditions and leading a substandard life. With the meagre resources of both the Government and the people it is very difficult to change the existing living standards, but at least, a focus can be drawn towards parasitic diseases. This problem could be partially solved by educating the people and making them aware of the hazards of helminthic diseases.

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References

1. Akinkugbe, F.M. (1980) Anemia in a rural population of Nigeria (Ilori). *Ann. Trop. Med. Parasit.*, 74:625.
2. Ansari, M.A.R.. and Nasir, AS. Iricstinal protozoa and helrninths detected by rapid method against Borstal Jail
3. Prisoners, Lahore. *Proc. 8th Pakistan Sc. Conf.*, 1956, p.49.
4. Ansari, M.A.R., Naru, N.A. and Chaudhary, M.A.(1968) Intestinal parasites of Rang Mahal area of Lahore City. *PakistanJ.* 111th., 18:33.
5. Beck, J.W. and Barrett-Connor, E. *Medical parasitology*. Saint Louis, Mosby 1971, p.86.
6. Biswas, H., Axon, R.A. and Sehgal, S. (1978) Epidemiology of H.nana infections in a selected rural community. *J. Commu.*, 10:170.
7. Cameron, T.W.M. *The Parasites of man in temperate climates*. University of Toronto Press, 1960, p.34.
8. Farooki, M.A. (1964) An investigation of human intestinal parasitism in some areas of West Pakistan. *Pakistan J. Med.Res.*, 3:113.
9. Islam, S.M.,A.and Haleem, M.A. (1968) A comparison of intestinal parasitosis in Karachi and other parts in Pakistan. *Pakistan J. HIth.*, 18:91.
10. Kuntz, RE and Moore, S.P. (1971) Intestinal parasites and commensals of an indigenous population in the lake Baringo area of Central Kenya. *Proc. Helm. Soc. Wash.*, 38:215.
11. Pal, R.A. and Malik, Z. (1979) Incidence of intestinal parasites in primary school children of islamabad. *Pakistan J. ZooL*, 11:105.
12. Saleem, A. Incidence of hehninthiasis and dysenteries in Karachi. *J.PMA.*, 9:175.
13. Siddiqui, M.N. and Bano, L. (1979) Observations on parasitic infections in school children of Peshawar. *Pakistani. ZooL*, 11:113.