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

Pages with reference to book, From 156 To 161

Riaz Ahmed Pal, Shahid Islam Rana (Department of Biological Science, Quaid-i-Azam University, Islamabad.)

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 protozoa during September 1980 to September 1981 and the following protozoan parasites were recorded: Entamoeba histolytica, E. coli, iodamoeba buetschlli, Giardia lamblia, and Pentarichomonas hominis. Of the total patients examined 41.88% from Rawalpindi and 42.14% from Islamabad carried intestinal protozoan infection . In both the cities E. histolytica and G. lamblia had an almost similar incidence while E. coli, I. Buetschlii, and P. hominis showed a very low percentage of infection. It was noted that such factors as heavy faecal pollution of the premises, unsanitary faecal disposal, unhygienic water supply, and poor personal cleanliness facilitate transmission of these parasites (JPMA 33: 156, 1983).

Introduction

Intestinal protozoan parasitic diseases especially amoebiasis and giardiasis are of immense importance in regard to human health as these have a drastic effect on the vitality of the host.. These diseases are cosmopolitan and they are found throughout the inhabited parts of the world but their relative importance varies due to changes in the climatic conditions and other socio-economic factors. In different parts of the world surveys have been conducted in this regard (Kuntz and Moore, 1971; Cross et al., 1976; Jones, 1980; Godsmid, 1981) and in Pakistan too work has been done on similar lines (Ansari and Sap.ru, 1964; Pal and Malik, 1979; Siddiqi and Bano, 1979; Khan and Mujib, 1979; Banatwala and Zuberi, 1980; Bilqees et al., 1982). In an earlier communication Pal and Rana (1983) discussed the incidence of intestinal helminth parasites of man in the twin cities of Rawalpindi-Islamabad and the present report deals with the intestinal protozoan parasites of man in the same twin cities.

Material and Methods

This study involved all the stool samples which were received for examination in seven hospitals of Rawalpindi-Islamabad over a period of one year i.e. September 1980 to September 1981. A total of 5360 patients (females: 2450, males: 2910) from Rawalpindi and 3490 cases (females : 1690, males : 1800) from Islamabad were studied. The procedure for the collection of morning stools and the method for obtaining other pertinent information using a questionnaire have already been described in an earlier communication (Pal and Rana, 1983).

The stool samples were examined by direct smear method in normal saline and Lugol's Iodine. Each sample was studied under the microscope for at least five minutes. Trophozoites as well as cysts were studied under 40 X objective lens. As described earlier by Pal and Malik (1979) no distinction was made between Entamoeba histolytica and E. hartmanni.

Results

Of the total patients examined 41.88% from Rawalpindi and 42.14% from Islamabad were found infected with intestinal Protozoa. Frequencies of specific infections according to region are given in Table 1.

Table I

Frequencies of Specific Infections.

Protozoa	Rawalpindi %	Islamabad %
E. histolytica	5.31	5.64
E. coli	1.49	2.66
I. buetchlii	1.77	1.43
G. lamblia	32.91	31.77
P. hominis	0.39	0.63

Table II

Percent Infection of Intestinal Protozoa by Sex in Rawalpindi and Islamabad.

	Rawalpindi		Islamabad	
	Male	Female	Male	Female
E. histolytica	3.60	7.34	5.72	5.56
E. coli	1.44	1.55	2.66	2.66
I. buetschlii	1.54	2.04	1.38	1.47
G. lamblia	26.18	40.89	31.77	31.77
P. hominis	0.37	0.40	0.61	0.65

Table II shows the prevalence of intestinal protozoa according to sex in Rawalpindi and Islamabad. In

Rawalpindi, 33.16% males and 5 2.24% females carried intestinal protozoan infec tion. The infection of G. lamblia was higher in females than in males. Although a slight increase in the infection of E. histolytica was observed in females, there were minor degrees of differences in infection by the rest of the protozoa. An incidence of 42.16% from males and 42.13% from females was recorded for intestinal protozoa in Islamabad. In this city sex had no influence on the distribution of these parasites.

Table III

Percent Incidence of Intestinal Protozoan Parasites in Different Age Groups of Rawalpindi-Islamabad
(R = Rawalpindi; I = Islamabad)

	E. histolytica R/I	E.coli R/I	I. buetschlii R/I	G. lamblia R/I	P. hominis R/I
0-4	0.54/0.48	0.22/0.25	0.18/0.14	5.31/4.84	0.03/0.05
5-9	0.87/1.17	0.26/0.28	0.26/0.14	7.27/5.10	0.07/0.11
10-14	0.98/0.77	0.27/0.45	0.24/0.20	5.69/6.96	0.05/0.11
15-19	0.84/0.68	0.16/0.48	0.29/0.34	4.10/5.21	0.03/0.08
20-29	0.29/0.57	0.13/0.34	0.16/0.14	3.88/4.15	0.03/0.05
30-39	0.41/0.51	0.14/0.22	0.14/0.11	2.55/2.32	0.05/0.02
40-49	0.42/0.60	0.09/0.20	0.14/0.11	1.84/1.63	0.05/0.05
50-59	0.44/0.57	0.11/0.17	0.18/0.14	1.00/0.71	0.01/0.05
60^{+}	0.50/0.25	0.07/0.22	0.13/0.08	1.23/0.83	0.01/0.05

Table III indicates the prevalence of intestinal protozoa according to different age-groups. in Rawalpindi and Islamabad. Where as G. lamblia was the most common parasite showing a high rate of infection in children of 5-9 and 10-14 year age-groups in Rawalpindi and Islamabad respectively, P. hominis was the rare parasite with a low incidence in individuals of all age-groups.

Table IV

Correlation Between Protozoan Infection and Environmental Conditions in Rawalpindi.

	Number of individuals	E.histolytica	E.coli	I.buetschlii	G.Lamblia	P.hominis
Faecal pollution of the premises						
Low	1470	4.76	1.02	1.36	20.40	0.34
Moderate	2085	5.22	1.67	1.91	37.17	0.38
Heavy	1805	5.87	1.66	1.93	38.17	0.44
Faecal disposal						
Sanitary privy	3410	4.69	1.26	1.61	25.80	0.23
Unsanitary privy	1250	6.40	1.76	1.60	43.52	0.40
No facility	700	6.42	2.14	2.85	48.57	1.14
Drainage						
Open	3410	5.65	1.61	1.99	35.92	0.43
Underground	1950	4.71	1.28	1.38	27.64	0.30
Domestic refuse						
Bins	2224	5.39	1.43	1.66	28.59	0.40
Open	3136	5.26	1.53	1.84	35.96	0.38
Water supply						
Tap water	4728	4.27	1.37	1.52	29.86	0.35
Hand pump	342	13.74	2.33	3.80	65.78	0.58
Well	190	18.94	3.68	5.26	66.84	1.05
Personal cleanliness						
Good	920	4.13	1.08	1.30	22.28	0.21
Satisfactory	1980	4.04	1.11	1.81	32.07	0.35
Poor	2460	6.78	1.95	1.91	37.56	0.48
Physical condition						
Well nourished	1685	4.51	0.59	1.30	13.94	0.17
Under nourished	1882	5.36	1.32	1.75	37.77	0.37
Malnourished	1793	6.02	2.50	2.23	45.62	0.61
Family size						
1-3	1040	4.61	0.96	0.96	30.48	0.09
4-6	1375	4.50	1.38	1.67	32.94	0.43
7-9	1737	5.46	1.61	2.41	33.39	0.46
10^{+}	1208	6.62	1.90	2.06	34.27	0.49

Table V

Correlation Between Protozoan Infection and Environmental Conditions in Islamabad.

	Number of individuals	E.histolytica	E.coli	I.buetschlii	G.lamblia	P.hominis
Faecal pollution of premises						
Low	3321	5.35	2.55	1.38	31.04	0.60
Moderate	100	10.00	3.00	2.00	40.00	1.00
Heavy	69	13.04	7.24	2.89	55.07	1.44
Faecal disposal						
Sanitary privy	3433	5.24	2.88	1.31	31.63	0.58
Unsanitary privy	35	20.00	11.42	8.57	34.28	2.85
No facility	22	45.45	27.27	9.09	50.00	5.54
Drainage						
Open	90	7.77	4.44	2.22	27.77	1.11
Underground	3400	5.58	2.61	1.41	31.88	0.61
Domestic refuges						
Bins	2580	5.11	2.51	1.35	31.55	0.58
Open	910	7.14	3.07	1.64	32.41	0.76
Water supply						
Tap water	3435	31.12	2.32	1.33	31.41	0.58
Hand pump	25	60.00	12.00	4.00	40.00	4.00
Well	30	71.42	20.00	8.57	57.14	5.71
Personal cleanliness						
Good	936	3.52	1.38	1.06	15.59	0.21
Satisfactory	1477	5.95	3.11	1.48	37.23	0.74
Poor	1077	7.24	3.15	1.67	38.34	0.83
Physical conditions						
Well nourished	992	3.83	1.81	1.10	26.81	0.50
Under nourished	1360	5.36	2.35	1.32	34.77	0.51
Malnourished	1138	7.55	3.17	1.84	41.30	0.87
Family size						
1-3	950	3.15	1.26	0.84	24.73	0.31
4-6	1025	4.68	2.04	1.07	27.31	0.48
7-9	780	6.66	3.46	1.79	37.17	0.76
10^{+}	735	9.11	4.48	2.31	40.68	1.08

Tables IV and V show correlation between the parasitological findings and environmental conditions of Rawalpindi and Islamabad. These observations were almost similar to those communicated earlier (Pal and Rana, 1983).

Discussion

E. Histolytica is the most pathogenic amoeba of man. Its incidence is almost similar in Rawalpindi and Islamabad. It is transmitted through contaminated food and water but the cysts may also be carried through flies and food handlers. Chlorination of water has been shown not to kill the cysts (Levine,

1973). For unknown reasons males are more infected than the females (Cameron, 1960). In Islamabad both the sexes have an almost similar incidence of this amoeba while in Rawalpindi females showed a higher rate of infection which is contrary to the observations of Cam-ron (1960). Available information for the regions of Peshawar (Siddiqui and Bano, 1979) and Karachi (Bilqees and Ali, 1981) reveals respectively 14.5% and 53% incidence of E. histolytica. This is a very high level of incidence as compared to that reported in the present studies. In particular reference to Karachi it appears that the inhabitants of Rawalpindi-Islamabad enjoy better hygienic conditions and moreover climatic differences are also playing a substantial role in the distribution of this parasite. Favourable temperature and humidity in Karachi as compared to Rawalpindi-Islamabad are likely to be among the factors which may enhance longevity of cysts.

Among the intestinal flagellates G. lamblia occupies an important position due to its pathogenicity and is a common parasite of children. Its incidence is almost similar in Rawalpindi and Islamabad but is higher than recorded for Peshawar (Siddiqui and Bano, 1979) and Pal and Malik (1979) no linear relationship was observed in the present study between ages of children and incidence of infection. However, an increase in infection in different age groups upto 14 years, has been shown here in Islamabad and in Rawalpindi the highest incidence was observed in the 5-9 year age group.

E. coli, I. buetschlii, and P. hominis have a low incidence in the regions of Rawalpindi and Islamabad. Such a level of infection seems to be of minor importance and moreover, they are least pathogenic. Contaminated food and water, infected food handlers and contact favour transmission of one or the other of these protozoan parasitic diseases. But from the present studies it is apparent that such factors as heavy faecal pollution of the premises, unsanitary faecal disposal, unhygienic water supply, and poor personal cleanliness also facilitate transmission of these parasites. It is therefore necessary that emphasis must be laid on improvement of the existing hygienic and living standards of the people in these twin cities. It is suggested that a wide ranging campaign should be latinched by physicians, educationalists, and mass media to educate the people so as to make them aware of the hazards of these parasitic diseases and advantages of hygienic living. A concerted effort in this regard may bring fruitful results to improve the well being of the inhabitants of this region in general and of Pakistan in particular.

Acknowledgements

The authors are thankful to Prof .M.A. Hafeez, Department of Biological Science, Quaid-i-Azam University, Islamabad, for critically reading the manuscript. The assistance of the following persons in collecting stool samples from their respective hospitals is also gratefully acknowledged: Dr. Shamsul Arfeen, Central Government Polyclinic, Islamabad; Maj. Gen. Dr. M.I. Burney, National Institute of Health, Islamabad; Dr. Shaukat Mi Shah, District Headquarters Hospital, Rawalpindi; Brig. Dr. Chaudhary Safdar Mahmood T.l. (M), Combined Military Hospital, Rawalpindi; and Lt. Col. Dr. Saleem Ahmad Khan, Canton-ment General Hospital, Rawalpindi.

References

1. Ansari, M.A.R., and Sapru, Z.A. (1964) Intestinal parasite infections in children of a primary school of Lahore; preliminary survey. Pakistan J. Hlth., 14 : 87.

2. Banatwala, N.S. and Zuberi, S.J. (1980) A study of intestinal and hepatic amoebiasis. Pakistan J. Med. Res., 19 : 7.

3. Bilqees, F.M. and Ali, M.N. (1981) Protozoan iutestinal infections in Karachi. Pakistan J. Med. Res., 20 :6.

4. Bilqees, F.M., Khan, A., and Ahmed, A. (1982) A survey of intestinal protozoan and helminth

parasites in Karachi. Pakistan J. Med. Res., 21: 54.
5. Cameron, T.W.M. The parasites of man in temperate climates. 2nd ed. Torauts, University of Toronto, 1960, p.8.
6. Cross. J.H., Clarke, M.D., Cole, W.C., Lein, J.C., Partono, P., Josoe, A., and Kosin, E.H. (1976) Parasitology survey in Northern Sumatra, Indonesia. J. Trop. Med. Hyg., 79 : 123.
7. Goldsmid, J.M. (1981) Intestinal parasitic infections of man in Tasmania. Trans. Soc. Trop. Med. Hyg., 75 : 110.
8. Jones, H.l. (1980) Intestinal parasitic infections in Western Australian Aborgines. Med. 3. Aust.2:375.
9. Khan, A., and Mujib, B. (1979) Studies of gell diffusion test in amoebiasis. JPMA., 29 :268.
10. Kuntz, R.E. and Moore, S.P. (1971) Intestinal parasites and cominensals of an indigenous population in the lake Baringo area of Central Kenyia. Proc. Helm. Soc. Wash., 38 : 215.
11. Levine, N.D. Protozoan parasites of domestic animals and of man. 2nd ed. Minneapolis, Burgess, 1973, p. 138.
12. Pal, R.A. and Malik, Z. (1979) Incidence of intestinal parasites in primary school children of Islamabad. Pakistani. Zoo!., 11: 97.
13. Pal, R.A. and Rana, S.I. (1983) Incidence of intestinal helminth parasites of man in the twin cities of Rawalpindi Islamabad. JPMA., 33 : 33.
14. Siddiqi, M.N., and Bano, L. (1979) Observations on parasitic infections in school children of Peshawar. Pakistani. Zool., 11:109.