

Intestinal parasitic infestations in Children living in the under privileged sector of the Jaffna Municipality

C. Nageswaran MBBS*

N. Sivarajah MBBS, DTPH, MD (Community Medicine)**

Summary

Two hundred specimens of stools from children under 5 years living in the under-privileged sector of the Jaffna Municipality were examined for parasitic infestation.

One hundred children (50%) showed evidence of intestinal parasitic infestations. Among them 51% had single infestation: 34% double infestations and 15% triple infestations.

Whipworm was found in 27%; Roundworm in 22.5%. Giardia in 17% and Hookworm in 10% of the children. Hookworm infestation was not found in children under 2 years. All other intestinal parasites were found in infants.

Introduction

Intestinal parasitic infestation is a major problem in all developing countries. Annual deaths due to roundworm infestation alone is estimated to be about 20,000 (Pawlowski, Z. S., 1985)¹. The prevalence of these infestations in an area is related to the hygienic condition of that area.

The prevalence of intestinal parasitic infestations in various regions of Sri

Lanka has been studied in the past. Recent studies have been carried out by De Silva D. G. H. and Jayatileke S. M. D. (1981)², and Malcolm. A. Fernando and Balasooriya S., (1976)³. These studies indicated a high prevalence of these infestations in the slum area in Colombo and in the Hindagala Community Health Project Area of the Faculty of Medicine, Peradeniya.

The prevalence of intestinal parasitic infestation in Northern Sri Lanka has not been studied. This study is an attempt to fill this gap.

Area

The Jaffna Municipal Council serves an area of 20.2Km². The population of this municipality during the census of 1981 was 118,215. (Statistical abstract of the Democratic Socialist Republic of Sri Lanka, 1982)⁴. The Jaffna Municipal Council had identified 16 clusters where the under-privileged sector of the population lives. People living in these areas belonged to the low socio-economic group; a majority have poor housing and live in unhygienic surroundings.

* Lecturer in Parasitology, University of Jaffna.

** Head, Department of Community Medicine, University of Jaffna.

Correspondence to C. Nageswaran.

A socio-economic and health survey of this underprivileged urban sector was carried out recently by the Department of Community Medicine, University of Jaffna. The survey revealed that there were 18,099 people living in 2706 households in these 16 clusters. There were 6.7 persons per household and 5.1 members per family. Majority of the households (75.3%) were one family households. About one third of the families owned the land on which they lived and 37.1% of the houses had roofs and walls of permanent materials. About two thirds (63.0%) of the households did not have a latrine and 52.8% used the backyard, street drain or sea beach to defecate (unpublished data).

Among this group of people, there were 2892 children (16%) under the age of five years.

Materials and Methods

A 10% sample of the 2892 children under 5 years, stratified by age was selected for the study.

The health staff and volunteers working within the Jaffna Municipality visited the households of the children and collected specimens of stools in plastic containers. The specimens were collected during the period January to March 1986. One specimen of stools per child was examined on the same day or the following day, by one of the authors (Dr. C. Nageswaran), at the Faculty of Medicine, University of Jaffna. Whenever the specimen had to be examined the next day, it was preserved in formalin. The specimens of stools were examined by direct saline and iodine smear, and also after concentration using the formal ether concentration technique.

Results

Two hundred specimens of stools were examined for the presence of ova and cysts from among 289 children. The response rate was 69.2 (Table I).

Table I

Response Rate (in %) by age			
Age group in months	Number sampled	Number Examined	Response rate
Under 12	56	37	66.1
12 — 23	59	38	65.5
24 — 35	56	44	80.0
36 — 47	68	43	64.2
48 — 59	50	38	77.5
Total	289	200	69.2

The distribution of children examined and infested is given in Table II.

The prevalence of intestinal parasitic infestation is given in Table III. Fifty percent of the children examined were infested with one or more of the parasites. The commonest infestations were whipworm (*Trichuris Trichura*), Round worm (*Ascaris lumbricoides*) and Giardia (*Giardia lamblia*). Ten percent had Hook worm ova.

The analysis of prevalence of parasitic infestation by age is given in Table IV. Whipworm infestation was present in 27%, round worm in 22.5%, giardia in 17% and hook worm in 10% of the children examined.

Discussion

Intestinal parasitic infestation is common in the less developed regions of the world. Studies by Jayawardena L. G (1957)⁵

Table II

Number of Children Examined by age and sex

Age groups (in months)	Number Examined		Number Positive	
	Male	Female	Male	Female
Under 12	20	17	6 (30%)	5 (35.3%)
12 — 23	21	17	11 (52.4%)	7 (41.2%)
24 — 35	25	19	16 (76.2%)	18 (94.7%)
36 — 47	27	16	20 (74.1%)	13 (81.3%)
48 — 49	20	18	17 (85%)	14 (77.8%)

showed that general infestation rate was 73.0% for urban areas and 88.3% for rural areas of Sri Lanka. Sivalingam V (1961)⁶ found that the general infestation rate in and around Colombo and greater Colombo area was 90.8%. Malcolm. A. Fernando

and Balasooriya. S (1976)³ reported that in the Hindagala Community Health Project area, the general infestation rate was 83.5%. De Silva. D. G. H. and Jayatileka S. M. D. (1981)² reported that 100% of the children under 14 years, living in an urban slum community in Kirillapona, Colombo had helminthic infestation. (Table V).

Table III

Prevalence (in %) of Intestinal Parasitic Infestation

Parasitic Infestation	Number positive	Prevalence rate (in %)
Pathogenic		
Whipworm ova	54	27.0
Round worm ova	45	22.5
Giardia lamblia cyst	34	17.0
Hookworm ova	20	10.0
Strongyloid stercoralis	01	0.5
Non Pathogenic		
Entamoebacoli cyst	08	4.0
Trichomonas hominis	01	0.5

The present study was carried out only among children under 5 years. The general infestation rate of this population was 50% and is comparable to the general infestation rate in the Hindagala Community Project area which was 6.2% for children under 5 years. (Malcolm. A. Fernando and Balasooriya. S, 1976)³.

Out of the 100 children who had evidence of intestinal parasitic infestation, 51% had single infestation, 34% had double infestation and 15% had triple infestation.

The prevalence of intestinal parasitic infestation by age groups is given in Table IV. All parasitic infestations show a gradual increase in prevalence with age.

Table IV

Prevalence (in %) of Intestinal Parasites by Age

Age group (in months)	Prevalence Rate (in %)			
	Whip worm	Round worm	Giardia lamblia	Hook worm
Under 12	7.6	8.1	12.8	Nil
12 — 23	13.5	21.1	13.2	Nil
24 — 35	28.6	28.5	15.9	7.1
36 — 47	26.6	20.0	22.2	15.5
48 — 59	60.5	35.1	18.9	27.0
Total	27.0	22.5	17.0	10.0

Table V

Studies on Prevalence of Soil Transmitted Helminths in Sri Lanka

Study area	Period	Age group	General Infestation rate (in%)	Reference
Sri Lanka	1924—1925	All ages	90.5	Sweet W. C. (1928) reported by Chellappah S.F. (1938)
Colombo	1953—1955	2—17 years	73.0	Jayawardena L. G. (1957)
Rural	1953—1955	2—17 years	18.3	„
Areas in & around Colombo & Greater Colombo	1946—1952	All ages	90.8	Sivalingam V. (1961)
Hindagala Community Health project area	1966—1967	All ages	83.5	Malcolm A. Fernando & Balasooriya S. (1976)
Urban slum community in Krillapona	1981—	0—14 years	100%	De Silva D. G. H. & Jayatileka S.M.D. (1981)
Jaffna Municipal council (under - privileged urban sector)	1985—1986	Under 5 years	50%	Present study

Whipworm infestation was found in 27.0% of the children examined. Among the infants, 7.6% harboured the same parasite (whip worm). The prevalence increased with age, and among the 48-59 months age group children, 60.5% were harbouring the worm. In the Hindagala area, only 9.4% of the children under 4 years had the infestation (Malcolm A Fernando and Balasooriya S, 1976),³ while in an urban slum community in Colombo, the prevalence rate was 94% for the same age group (De Silva D. G. H and Jayatileka S. M. D, 1981)².

Round worm infestation was found in all age groups and the prevalence increased with age. It was the second commonest infestation in infancy. Among the children 48 — 59 months old, 35.1% were harbouring the parasite.

Giardia was the commonest infestation among the infants, with 12.8% of them harbouring the parasite. But the prevalence of this parasite among the children 48 — 59 months old was the lowest (18.9%) when compared with other infestations.

Hookworm infestation was present only in 10% of the children under five years of age though Chellappah S. F. (1936)⁷ reported an infestation rate of 90.5%. This study is comparable with the studies in Hindagala with a comparable rate (11.2%). Even in the slum

community in Colombo, where the parasitic infestation was 100%, only 16% had Hookworm infestation.

The difference in the age specific infestation rate between the sexes were small and not significant. (Table II).

Hookworm infestation was not found in children under 24 months, as they were unlikely to come in contact with contaminated soil until the age of 2. However infants have been infested with faeco-oral transmitted parasites like roundworm, whipworm and giardia. A child six months old was infested with giardia, and a child 4 months old had round worm and whipworm infestation. It is most likely that the infection was introduced by the mother or others who fed the child. It is also possible that the floor of these houses (mostly made of mud covered with a layer of cowdung) have viable eggs of the intestinal parasites.

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