

HOOKWORM INFESTATION AS A CAUSE OF CHRONIC ABDOMINAL PAIN IN YOUNG SINGAPORE MALES

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INTRODUCTION

The high incidence of vague abdominal discomfort among National Servicemen, who exhibit a persistent lack of response to antacids prompted a search for its causation.

An initial few subjects who yielded positive results on routine stool ova examination, led to the focusing of attention on the detection and treatment of hookworm infestation in this population.

It was commonly believed that with urbanisation, the incidence of parasitic worm infestation has fallen in Singapore. However, the many ova-positive cases which the study yielded may indicate that epidemiological attention should now be placed on imported cases, as many of these soldiers had overseas training experience prior to the onset of symptoms.

MATERIALS AND METHODS

During the period of January 1985 to April 1985, all subjects seen at Pasir Laba Medical Centre for vague abdominal pains of more than 3 days duration were screened. Lack of response to antacid therapy was also a criterion of selection. These were all young men aged 18 to 20 years.

Screening procedures included the following:

a. History

The nature and duration of the abdominal complaint was queried as were associated symptoms of vomiting, diarrhoea, and passage of worms in the stools. Previous treatment efficacy with antacids was also assessed.

Specific symptoms relating to parasitic infestation and eosinophilia were asked for (malaise, weight loss, rashes, joint pains, allergy, rhinitis, asthma).

b. Physical Examination

A full abdominal examination was performed and attention paid to pallor and asthmatic signs.

c. Investigations

A qualified laboratory technician performed all of the tests. Confirmation of ova positive stool samples was given by the Microbiology Department of National University of Singapore.

Haemoglobin estimation, eosinophil count and stool microscopy were conducted.

d. Treatment

Stool ova positive patients were treated with a course of mebendazole and re-evaluated after 7 to 10 days for symptomatology and, in some cases, repeat eosinophil count and stool examination.

RESULTS AND OBSERVATIONS

The results of the screening tests on 69 patients presenting with abdominal discomfort is detailed in Figure 1 below.

A large proportion of the subjects complained of associated vomiting and the passage of loose stools. A single patient presented with malaise of 9 months and yet another of narcolepsy, (falling asleep frequently at classes).

Eosinophilia of 8% or more was considered as significant. 39 subject (56.5%) had eosiniphilia. Of these, 32 had ova in their stools 82.1% of eosinophilic cases or 46.4% of the study population).

Taking 12.5% of haemoglobin as the minimum normal level, only 7% of those with eosinophilia or 9% with hookworms infestation were found anaemic. Even then, only mild or borderline anaemic was present in these cases.

The types of worm infestation detected in the 32 ova positive cases is detailed in Figure 2.

FIGURE 2 TYPES OF WORMS FOUND IN THE 32 OVA POSITIVE PATIENTS

	No of Cases	%
Single Infection		
Hookworm	27	84.5
Ascaris	1	3.1
Trichuris	1	3.1
Whipworm	0	0
Double Infection		
Hookworm + Ascaris		3.1
Hookworm + Trichuris	1	3.1
Hookworm + Whipworm	1	3.1
	<u>32</u>	<u>100.0%</u>

Treatment for ova positive cases comprised a 3 day course of mebendazole 100mg bid. On review a week

FIGURE 1 RESULTS OF HOOKWORM SCREENING AND TREATMENT OF 69 CASES OF ABDOMINAL DISCOMFORT

	No of Cases	% of Total Cases	% of Eosinophilia Cases
Symptoms			
Loose Stools	28	40.5	—
Vomiting	9	13.0	—
Passage of Worms in Stools	7	10.1	18.0
Malaise	1	1.4	2.6
Narcolepsy	1	1.4	2.6
Recent Travel Abroad	27	—	69.2
Investigations			
Eosinophilia	39	56.5	—
Stool ova positive	32	46.4	—
Haemoglobin (gm%) (Only tested in the 39 eosinophilic cases)			
10.5 — 11.4	1	—	2.5
11.5 — 12.4	2	—	5.1
12.5 — 13.4	13	—	22.0
13.5 — 14.4	16	—	27.1
14.5 — 15.4	7	—	11.9
Mebendazole Treatment (Only done in the 39 eosinophilic cases)			
Fall in Eosinophil count	—	—	100
Symptomatic Relief	—	—	88
Stool ova positive (after treatment)	—	—	40

later, most attested to symptomatic relief although a random stool ova test on 12 cases showed 40% to be positive.

DISCUSSION

Abdominal discomfort as a symptom of hookworm infestation

46.4% of these patients were found to have hookworms. 88% of them also recovered from their symptoms after hookworm therapy.

As such, parasitic worm infestation is an important differential diagnosis in a population satisfying the following criteria:

- a. Males, aged 18 to 20 years.
- b. Abdominal discomfort lasting at least 3 days and having failed antacid therapy.
- c. History of travel abroad (70%).

This study also reveals an unexpectedly high prevalence of hookworm infestation among Singaporeans despite urban living. It appears likely that most of our cases are imported. Many of these patients also have a history of recent stay in offshore islands.

Further epidemiological studies in a larger population of Singaporeans is thus warranted. Females with recent history of travel also should be investigated, as sex difference in incidence have been demonstrated with a female preponderance. (1)

Eosinophilia and hookworm infestation

In this study, 82% of subjects with an eosinophil count of 8 or more were found to have parasitic worm infestation. It is thus a reliable and useful investigational tool in the screening for parasites, being readily available and easily conducted.

These findings correlate well with those found by Yamaguchi in the Indochinese. (2)

Anaemia in hookworm infection

In Yamaguchi's study of refugees, he found that those with parasitic infections, particularly hookworm infection had significantly lower values for haemoglobin concentration.

This was not found in this study, where only 9% of those infected had borderline anaemia. It is likely that good nutrition in this population of otherwise healthy young Singaporean males has offset the blood loss due to the parasite. Thus, the absence of anaemia is not a useful diagnostic index for hookworm infection in the local population.

The nature of the intestinal parasites detected

Almost all the cases were due to hookworm infection. Most were single infection, double infection occurring in only 3 cases (all having hookworms). No cases of triple infection were found. This contrasts with other regional studies (1, 3) where the other worms were prevalent.

The prevalence of hookworms in this population suggests that public health efforts must be directed at foot wear and skin protection rather than on food hygiene alone. This is of particular relevance during trips to local offshore islands and foreign countries.

CONCLUSIONS

In this study, it was demonstrated that hookworm infection is an important cause of abdominal discomfort in young Singaporean adult males, especially those with a history of recent travel abroad.

Its unexpected high incidence as a cause of morbidity in an urban environment indicates that modern sanitation, although important in preventing local spread of infection, is unable to reduce the prevalence of the disease which is largely imported. Fortunately, it is readily detected by eosinophil counts and stool ova and effectively eradicated by antihelminthic preparations.

In the words of Latham in his treatise on parasitic disease, (4) "it is suggested that highest priority be given to the disease of hookworm infection because it can be treated successfully, diagnosed easily, and has a high prevalence".

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