

# SURVEY OF ENTEROBIASIS IN CHILDREN ADMITTED TO THE UNIVERSITY HOSPITAL IN KUALA LUMPUR

S.P.KAN D.SINNIAH

## SUMMARY

A total of 346 paediatric in-patients in the University Hospital in Kuala Lumpur was examined for infection with *Enterobius vermicularis* using two anal swabs taken on two consecutive days. 24% of these children, whose mean age was 6 years [range 2-14 years] were infected. The infection was more prevalent among children between the ages of 5-11 years. There is only a slight difference in the distribution of infection among Malay, Chinese and Indian children. There is no significant difference in the prevalence of infection between boys and girls.

## INTRODUCTION

While numerous surveys have been carried out to study the prevalence of infection with soil-transmitted helminths (Lie, 1964; Bisseru and Aziz, 1970; Lie *et al.*, 1978), no data is available on the incidence of infection with the pinworm - *Enterobius vermicularis*, in Malaysia. This is mainly because normal methods of stool examination do not reveal the *Enterobius* eggs which are laid mainly in the perianal region. The presence of *Enterobius* eggs in the stool usually only indicates a spill-over from heavy infections. Nevertheless, *Enterobius* eggs were detected in 0.8% of 126 stool samples from Orang Aslis (Dissanaike *et al.*, 1977) and in 0.7% of 150 stool samples from oil-palm estate workers

(Sinniah *et al.*, 1978). A recent survey of over 35,000 people in Kuala Lumpur region revealed that about 1% have *Enterobius* eggs in their stools (Kan, unpublished data). The object of this study is to obtain some baseline data on the incidence of enterobiasis in Malaysia and the pattern of distribution among children of different ages, races and sex.

## MATERIALS AND METHODS

A total of 346 children (206 boys, 140 girls) who were admitted to the Paediatric Ward, University Hospital over a period of 6 months was studied. Their mean age was 6 years (range 2-14 years) and they included 72 Malays, 180 Chinese, 80 Indians and 14 Eurasians and other races.

The cellophane smear technique, which is a modification of Beaver's swab method (Beaver, 1952), was carried out on each child on two consecutive days, first thing in the morning, before a bowel movement and before a bath.

## RESULTS

Of the 346 children examined, 85 (24.6%) had pinworm infection. The prevalence of infection by age, ethnic group and sex is shown in table 1. The incidence of infection appears to be higher among the older children (from 5-11 years of age). The highest rate of infection was in the 10-11 age group while no case was observed in children under 4 years. There is a slight difference in the prevalence of infection between the ethnic groups, the incidence being highest among Malay children, followed by Chinese and Indian children respectively. There appeared to be no significant difference in the distribution of infection between boys and girls.

---

S.P.Kan, B.Sc., Ph.D.  
Associate Professor  
Department of Parasitology  
Faculty of Medicine  
University of Malaya

D.Sinniah, MA, MD, FRACP, FRCPI, DCH.  
Associate Professor  
Department of Paediatrics  
Faculty of Medicine  
University of Malaya

---

## DISCUSSION

There is some controversy regarding the relative reliability of diagnosing *Enterobius* infections from a single anal swab or multiple swabs done over a few consecutive days. Unlike the other intestinal helminths where the presence of gravid female worms is usually indicated by a relatively

constant and consistent egg output in the faeces, the gravid *Enterobius* females migrate out to the anus to lay their eggs. It is possible that this migration to the anus may not occur regularly and a single anal swab may not be adequate to detect all infected cases. Hence, in this study two anal swabs were taken on two consecutive days to reduce the chance of false negatives.

TABLE I  
PREVALENCE OF ENTEROBIASIS AMONG CHILDREN  
ACCORDING TO AGE, RACE AND SEX.

	No. Examined	No. Infected	% Infected
<b>I. AGE:</b>			
1 year	0	0	0
2 years	1	0	0
3 years	27	0	0
4 years	35	3	8.6
5 years	46	13	28.3
6 years	46	10	21.7
7 years	43	12	27.9
8 years	35	11	31.4
9 years	30	8	26.7
10 years	38	18	43.4
11 years	24	11	45.8
12 years	15	1	6.7
13 years	0	0	0
14 years	1	1	100
Total	346	85	
<b>II. RACE:</b>			
Malays	72	22	30.6
Chinese	180	47	26.1
Indians	80	15	18.5
Others	14	1	7.1
Total	346	85	
<b>III. SEX:</b>			
Male	206	54	26.2
Female	140	31	22.6
Total	346	85	

However, Cho *et al.* (1976) did not observe any significant differences in the post-treatment recovery of worms from patients whose infections were detected by a single anal swab or multiple anal swabs carried out on four consecutive days.

The incidence of infection among the children examined in the present study is quite high, as almost 25% of the children was infected. This incidence is comparable to that found in a similar survey of paediatric patients in a hospital in Singapore (Kan *et al.*, 1971). However, the above group of children examined in the University Hospital do not reflect strictly the normal population, as they were warded for other ailments which may render them more prone to parasitic and other infections. On the other hand, examination of the siblings as well as other family members of these infected children would reveal more realistic information on the actual incidence of enterobiasis in the normal population.

The higher incidence of enterobiasis among older children is not unexpected as they are more active and inquisitive and therefore more exposed to infection. There is a slightly higher incidence of infection among Malay children, followed by Chinese and Indian children. However, there is no evidence of any predisposition to enterobiasis among different races as enterobiasis is prevalent wherever there are conditions of overcrowding, poor personal hygiene, infrequent taking of baths or inadequate bathing facilities and improper changing and washing of bed-sheets, undergarments or other clothing.

#### ACKNOWLEDGEMENT

We are grateful to the staff of the Paediatric Wards, University Hospital and the Department

of Parasitology, University of Malaya for their co-operation and assistance.

#### REFERENCES

- Beaver, P.C. (1952) The detection and identification of some common nematode parasites of man. *Amer. J. Clin. Path.*, **22**: 481-485.
- Bisseru, B. and Aziz, A. (1970) Intestinal parasites, eosinophils, haemoglobin and gamma globulin in Malay, Chinese and Indian school children. *Med. J. Malaya*, **25**: 29-33
- Cho, S.Y., Kang, S.Y., Ryang, U.S. and Seo, B.S. (1976) Relationships between the results of repeated swab examinations and worm burden of *Enterobius vermicularis*. *Korean J. Parasit.*, **14**: 109-116.
- Dissanaike, A.S., Thomas, V., Kan, S.P. and Ong, H.T. (1977) Studies on parasitic infections in Orang Asli (Aborigines) in Peninsular Malaysia. *Med. J. Malaya*, **32**: 48-55
- Dunn, F.L. (1972) Intestinal parasitism in Malayan aborigines (Orang Asli). *Bull. Wld. Hlth. Org.* **46**: 99-113.
- Kan, S.P., Siak, C.L. and Singh, M. (1971) Prevalence of enterobiasis in children admitted to a hospital in Singapore. *Ann. Trop. Med. Parasit.* **65**: 81-83.
- Lie, K.J. (1964) Prevalence of intestinal helminths among patients of the General Hospital in Kuala Lumpur, Malaysia. *Trop. Geogr. Med.*, **16**: 229-237.
- Lie, K.J., Kwo, E.H. and Ow-Yang, C.K. (1971) Soil-transmitted helminths in rural infants and children near Kuala Lumpur. *Southeast Asian J. Trop. Med. Publ. Hlth.*, **2**: 196-200.
- Sinniah, B., Sinniah, D., Singh, M. and Poon, G.K. (1978). Prevalence of parasitic infections in Malaysian oil-palm estate workers. *Southeast Asian J. Trop. Med. Publ. Hlth.*, **9**: 272-276.