

Komunikasi Pendek/Short Communications

Trichuriasis among Orang Asli Children at Pos Lenjang, Pahang, Malaysia
(Trikuriasis di Kalangan Kanak-kanak Orang Asli di Pos Lenjang, Pahang, Malaysia)

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ABSTRACT

A cross-sectional study was conducted in February 2006 to determine the prevalence of *Trichuris trichiura* infection among Orang Asli (Aborigine) children at Pos Lenjang, Pahang. A total of 71 faecal samples were collected from the children (40 girls and 31 boys) aged between 1-12 years. The samples were examined for the presence of *Trichuris trichiura* ova using direct smear and formalin-ether concentration techniques. The result revealed that the overall prevalence of *Trichuris trichiura* infection was 43.7%. The infection was higher in males (51.6%) compared to females (37.5%), though not statistically significant ($p > 0.05$). According to age group, the school-aged children had higher prevalence of infection (56.8%) than preschool children (29.4%) ($p < 0.05$). Low socioeconomic status, large family size, poor environmental sanitation and poor personal hygiene are possible contributing factors that increase the prevalence of infection among the Orang Asli children at Pos Lenjang. In 31 samples positive for *Trichuris trichiura*, a detection rate of 100% was obtained using formalin-ether concentration, compared to 25.8% with direct smear technique. Thus, it is recommended that both techniques be performed in routine faecal examination for a more accurate diagnosis.

Keywords: *Trichuris trichiura*, Orang Asli, Malaysia

ABSTRAK

Satu kajian irisan lintang telah dijalankan pada Februari 2006 bagi menentukan prevalens infeksi *Trichuris trichiura* di kalangan kanak-kanak Orang Asli di Pos Lenjang, Pahang. Sejumlah 71 sampel feses telah diperolehi daripada kanak-kanak (40 perempuan dan 31 lelaki) yang berumur antara 1-12 tahun. Sampel-sampel tersebut kemudiannya diperiksa dengan menggunakan teknik apusan langsung dan konsentrasi formalin-eter bagi mengesan kehadiran telur *Trichuris trichiura*. Hasil kajian ini menunjukkan prevalens infeksi *Trichuris trichiura* secara keseluruhannya adalah 43.7%. Infeksi didapati lebih tinggi di kalangan kanak-kanak lelaki (51.6%) berbanding kanak-kanak perempuan (37.5%), walaupun secara statistiknya tidak signifikan ($p > 0.05$). Dari segi kumpulan umur, kanak-kanak bersekolah menunjukkan prevalens infeksi lebih tinggi (56.8%) berbanding kanak-kanak pra sekolah (29.4%) ($p < 0.05$). Status sosioekonomi yang rendah, saiz keluarga yang besar, tahap sanitasi persekitaran dan kebersihan diri yang rendah mungkin menjadi faktor-faktor yang menyumbang kepada peningkatan prevalens infeksi di kalangan kanak-kanak Orang Asli yang tinggal di Pos Lenjang. Daripada 31 sampel yang positif dengan *Trichuris trichiura*, didapati teknik konsentrasi formalin-eter menunjukkan kadar pengesanan 100% berbanding apusan langsung, kadar pengesanan hanya 25.8%. Oleh itu, adalah disarankan supaya kedua-dua teknik ini dilakukan di dalam pemeriksaan rutin feses untuk diagnosis yang lebih tepat.

Kata kunci: *Trichuris trichiura*, Orang Asli, Malaysia

Trichuris trichiura infection is one of the most common intestinal parasitic infections and it continues to be a public health problem in Malaysia, especially among underprivileged communities (Hesham Al-Mekhlafi et al. 2005; Nor Aini et al. 2007). Orang Asli, the indigenous people of Peninsular Malaysia who live near or in the jungle are among the underprivileged communities due to their poor living condition and lack of access to resources. Previous studies conducted among Orang Asli children in different areas in Malaysia revealed a high prevalence of *T. trichiura*, ranging from 41.7-98.2% (Rajeswari et al. 1994; Hesham Al-Mekhlafi et al. 2007). Prevalence was also high, ranging from 43.8-83.8% in children from other communities such as rural villages (Thomas et al.

1992), squatter areas (Bundy et al. 1988) and estates (Kan 1989).

The aim of this study was to determine the prevalence of *Trichuris trichiura* infection among 1-12 years old Orang Asli children at Pos Lenjang, Pahang.

This study was carried out at Pos Lenjang, an aborigine settlement in Pahang, situated about 320 km from Kuala Lumpur. The aborigines are from the Semai tribe and the village comprises of a very small population. Most of the houses were built on stilts, with bamboo and wood. There were basic amenities such as electricity (solar energy) and community standpipes for water supply but no toilets were provided for the families in this village.

Stool containers were distributed to the children aged 1-12 years old in the village and primary school. Each faecal container was labeled with the name, age, sex of the participant and sampling location. The faecal samples were collected on the next morning and brought back to the operation center for parasitological examination. Seventy one children (31 boys and 40 girls) participated in this study. The subjects' particulars together with the results of the faecal examinations were recorded.

Each faecal sample was subdivided into two parts: one part was unfixed (fresh sample) and the second part was fixed with 10% formalin. Both types of samples were examined for the presence of *Trichuris* eggs. The fresh samples were screened immediately in the field using the direct smear technique. Meanwhile the formalin-fixed samples were examined later using the formalin-ether concentration technique at the Parasitology Laboratory, Universiti Kebangsaan Malaysia.

PREVALENCE OF TRICHURIS TRICHIURA INFECTION ACCORDING TO GENDER AND AGE AMONG ORANG ASLI CHILDREN

Seventy one faecal samples were examined by the direct smear and formalin-ether concentration technique, respectively. The overall prevalence of *Trichuris* was 43.7%, with 51.6% males and 37.5% females being infected. According to age groups, about half (56.8%) of the school-aged children were found to be positive for *Trichuris*, whereas for the preschool children, the prevalence of infection was only 29.4% (Table 1).

TABLE 1. Prevalence of *Trichuris trichiura* infection according to gender and age among Orang Asli children at Pos Lenjang, Pahang

	No. of Examined Samples	No. of Positives Samples	Prevalence (%)
Gender			
Males	31	16	51.6
Females	40	15	37.5
Age groups			
Preschool (1-6 years)	34	10	29.4
Schooling (7-12 years)	37	21	56.8
Total	71	31	43.7

DETECTION OF TRICHURIS TRICHIURA INFECTION BY TWO DIFFERENT TECHNIQUES

Of the 31 positive samples for *T. trichiura*, 31 (100%) were microscopy positive using formalin-ether concentration and 8 (25.8%) were direct smear positive (Table 2).

TABLE 2. Detection of *Trichuris trichiura* infection by direct smear and formalin-ether concentration techniques

Diagnostic Techniques	Positive Samples (n = 31)	
	No.	%
Direct Smear	8	25.8
Formalin-Ether Concentration	31	100.0

The prevalence of *T. trichiura* infection among Orang Asli children at Pos Lenjang was 43.7%. This finding was in agreement with the study conducted among 1-12 years-old Orang Asli children at Post Brooke, Kelantan, which had reported 41.7% prevalence of *Trichuris* infection (Rahmah et al. 1997). In a study on Orang Asli children aged 1-12 years in Dengkil, Selangor, the prevalence of *Trichuris* infection was 91.7% (Norhayati et al. 1997) while a more recent study on 2-15 years-old Orang Asli children in peripheral Selangor showed a prevalence of 98.2% for *Trichuris* (Hesham Al-Mekhlafi et al. 2006). The high prevalence of infection showed in the present study, reflects that there is not much improvement in the problems of intestinal helminth infections among Orang Asli communities in Malaysia. However, variations of prevalence for *T. trichuris* infection in Malaysia may be attributed to differences in the characteristics of the population studied, study areas, methods of sample selection used, and the diagnostic techniques used to detect the infection. According to the review carried out by Lim et al. (2009), the health problems among the Orang Asli are associated with poverty. Recent studies revealed that *Trichuris* infection is the most common soil transmitted helminthiasis (STH). The risk factors for intestinal parasitic infections are still present and recent studies suggested that severe STH infections may contribute to other health and medical problems such as malnutrition, iron deficiency anaemia and low serum retinol in Orang Asli communities.

Helminth infections are common in poor socioeconomic communities, especially if there is lack of access to safe water supply, poor sanitation facilities, poor personal hygiene practices (Wani et al. 2009) and large family members. The Orang Aslis' activities, basic amenities and environmental conditions at Pos Lenjang were observed to support the findings of this study. Most of the residents have a poor socioeconomic background and they lived by farming, hunting, fishing and trading forest product. Normally, they have large family members who lived in single-roomed houses. The children who lived in overcrowded households with unhygienic surroundings may predispose them to helminthic infections transmitted via fecal-oral route.

Majority of the Orang Asli children were observed tended to be careless about personal hygiene and health-promoting practices which may contribute to the risk of the children acquiring infection with *Trichuris*. This behavior

can be seen based on their poor appearance such as dirty clothes and unclean bodies including their fingernails. They failed to wash their hands thoroughly with soap and water before eating or after defecating. They also consume contaminated food such as unwashed vegetables and fruits.

Due to poverty and logistic factor, this community had to struggle with poor living conditions where basic amenities such as safe drinking water, proper sanitary and garbage disposal were inadequate or absent. There were few stand pipes provided in this Orang Asli village that several families had to share one pipe for their needs and therefore, the existing stand pipes were unable to supply adequate water to all families. Although this community was provided with piped water supply, the river still plays an important role as a source of water for them. They used water from the river for daily activities such as washing clothes, bathing, cooking and drinking. There is probability the residents depend on the river as their major source of water due to insufficient piped water supply. Proper toilet facilities were absent and the children frequently defecate indiscriminately among the bushes near their houses. Some of them also used the rivers and streams for defecation and using river water to clean themselves. As a result, the environment that has been contaminated by infected individual feces may act as one of the sources of infection in the community.

In the current study, we observed that males had a higher prevalence (51.6%) than females (37.5%). This result was consistent with some findings from local studies (Sinniah 1984; Lee et al. 1999). Nevertheless, most of the previous findings proved that there was no significant difference between genders with reference to prevalence for helminth infections, indicating there was no difference in socio-behavioral activity or immune status between males and females (Hesham Al-Mekhlafi et al. 2006).

Trichuriasis cases were more common among the schoolchildren (56.8%) as compared to preschool children (29.4%). Previous observation on urban slum children from Kuala Lumpur demonstrated that the prevalence of *Trichuris* was increased with age and remained high at the age of 7 and above (Bundy et al. 1988). Norhayati et al. (1997) reported that the prevalence of *Trichuris* infection was significantly associated with age of Orang Asli children in Dengkil, Selangor. However, their result showed that the prevalence fluctuated and constantly high in all age groups. The possible reasons for the prevalence differences between age groups observed in this study are most likely due to the activities and behavior of the children. The *Trichuris* infection was common in school-aged children because of their greater outdoor activities compared to the preschool children. They often play on the soil which was polluted with human feces containing *Trichuris* eggs and put their hands in their mouths without washing them. In addition, the preschool children were more supervised by their parents and spend more time at home which may reduce the chances of exposure to infection.

In this study, each of the faecal samples was examined microscopically for *Trichuris* eggs using both the direct smear and formalin-ether concentration techniques. Based on the result, formalin-ether concentration was found to be the most sensitive technique for identifying *Trichuris* eggs in feces with detection rate of 100% compared to 25.8% with direct smear. Previous study has reported that the concentration technique allowed the detection of 98.5% of the total parasites found, whereas direct smears permitted the detection of only 75.8%. It was also reported that 92.3% of helminth ova can be detected by concentration technique while 61.5% was detected by direct smear. The concentration technique was found to significantly improve the detection of intestinal parasites (Wongstitwilairoong et al. 2005). A recent report by Oguoma & Ekwunife (2007) revealed that 5.26% of *T. trichuris* was detected by concentration technique while 2.11% was detected by direct smear. They suggested that the concentration technique is a very useful technique in diagnosing intestinal helminthes since it depicted a higher percentage of helminthes infection missed by direct smear technique. Hence, it is necessary that both techniques (the direct smear and concentration techniques) should be performed in routine parasitological examination for more accurate diagnosis before any control efforts can be implemented in the affected areas.

This preliminary study indicates that *Trichuris* infection is still prevalent and therefore this infection becomes one of the major public health problems among the Orang Asli communities especially among children. This calls for a well-planned control measures, including regular deworming of all children using effective broad spectrum anthelmintics and provision of food supplements (including vitamins and minerals) for the children. Meanwhile, improvement of socioeconomic status and environmental sanitation should be the important agenda to be considered in the design of long term STH control strategies in endemic areas. Furthermore, health education programme should be included in control measures to create awareness about health and hygiene in this population.

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