Ascariasis Among Orang Asli School Children at Kuala Kubu Bharu, Selangor

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ABSTRACT

Ascaris lumbricoides is considered as the largest intestinal nematode which infects man. It has the highest prevalence in area where sanitation level is low. A total of 159 Orang Asli (aborigine) school children from Kuala Kubu Bharu, Selangor participated in this study. The faecal specimens were collected and examined for *A. lumbricoides* ova using direct faecal smear and formalin-ether concentration techniques. The prevalence of ascariasis among the aboriginal school children in Kuala Kubu Bharu was 38.4%. With regards to the gender wise, the prevalence of infection was higher in males (44.9%) compared to females (33.3%). School children aged 9 years old showed the highest infection rate at 68.4%. From this study, it was found that the infection rate among the Orang Asli school children in Kuala Kubu Bharu was high despite they lived in a semi urban area with a better sanitation as compared to those living in the deep rural area.

Key words *: Ascaris lumbricoides;* Orang Asli (aborigine); school children

INTRODUCTION

Ascaris lumbricoides is one of the commonest helminths affecting human (Das et al. 2019). It causes important medical and social problems especially in the tropical and subtropical regions (Omotola & Ofoezie 2019). Infection of *A. lumbricoides* occurs in all age groups but it is commoner in children of preschool age in socioeconomic areas and with malnutrition and immune deficiencies (Joseph et al. 2014; Galgamuwa et al. 2018). Ascariasis is most common in children 2 to 10 years old and the prevalence of infection decreases over the age of 15 years. *A. lumbricoides* infection tends to cluster in families and worm burden correlates with the number of people living in a home (Elkins et al. 1986). In the early 1900s, the prevalence of *A. lumbricoides* infection in the United States decreased dramatically after the introduction of modern sanitation and waste treatment (Jones 1983). In Malaysia, prevalence of ascariasis in Ampang, Selangor and Beranang were 82% and 33% respectively (Lo et al. 1979). *Ascaris lumbricoides* infection in Kelantan on the other hand was 47.6% among rural school children (Mahendra et al. 1997). In heavy infection, *A. lumbricoides* may cause obstruction of the intestine by a mass of *A. lumbricoides* which may cause serious and lethal complications. The rate of mortality from intestinal obstruction is 5.7% below the age of 10 years (Khan & Ghauri 2016). This study aims to determine the prevalence of ascariasis among the aboriginal school children who live in a semi urban area with better amenities.

MATERIALS AND METHODS

Subjects and study area

A cross-sectional parasitological survey was carried out in an Orang Asli primary school at Kuala Kubu Bharu, in 2011. Kuala Kubu Bharu is a town in the district of Hulu Selangor, located some 50 km from Kuala Lumpur. The aboriginal school children are from the Temuan tribe. Stool containers were distributed to the students after an informed consent and 159 students aged between 7-12 years old participated comprising 69 boys and 90 girls.

Stool examination

The stool specimens were prepared for direct faecal smear and also fixed with 10% formalin for the formalin-ether concentration technique.

RESULTS

A total of 159 faecal specimens were examined using direct smear and formalin-ether concentration techniques. Out of 159 school children, 61 (38.4%) were found to be positive for *A. lumbricoides* infection. The prevalence of ascariasis was higher in males (44.9%) compared to females (33.3%). With regards to the participants age, school children at the age of 9 years old show the highest prevalence of ascariasis (68.4%).

TABLE 1. Prevalence of *Ascaris lumbricoides* infection among aboriginal school children at Kuala Kubu Bharu, Selangor according to participants age

Participants age (years)	Number of samples examined	Number positive	Prevalence (%)
7	44	10	22.7
8	26	12	46.2
9	19	13	68.4
10	25	11	44.0
11	21	9	42.9
12	24	6	25.0

TABLE 2. Prevalence of *Ascaris lumbricoides* infection of aboriginal school children at Kuala Kubu Bharu, Selangor according to gender

Gender	Number of examined samples	Number of positive samples	Prevalence (%)
Males	69	31	44.9
Females	90	30	33.3

DISCUSSION

High prevalence of ascariasis is usually associated with poverty, poor environmental conditions, lack of clean water and proper faecal disposal. The Orang Asli (aborigines) are the minority groups of people who dwell mainly in the tropical forests of the lowlands and hills in peninsular Malaysia (Sinniah et al. 2012). Several studies on parasitic infections conducted among the aborigines over the years showed the problem has not improved much (Noor Azian et al., 2007; Lim et al., 2009; Sinniah et al., 2010). *Ascaris lumbricoides* prevalence rate from 1970s to 2009 ranges between 4.6-86.7% (Ahmed et al. 2011). Several studies have demonstrated a high infection rate of ascariasis among aboriginal children in Malaysia (Norhayati et al. 1997; Mohamed Kamel et al. 2001) where the prevalence ranged between 33.3% - 69%. In this study, the overall prevalence of ascariasis was 38.4% which revealed that *A. lumbricoides* infection was common among the aboriginal school children in Kuala Kubu Bharu, Selangor. The highest prevalence rate of ascariasis in this study was seen in school children aged 9 years old which was 68.4%.

The results obtained in this study was more or less similar to other studies done in Malaysia. In Bachok, Kelantan, the prevalence of ascariasis among 9-10 year old rural school children was 49.7% (Anees et al. 2003). In Pos Betau, Kuala Lipis, Pahang, a high prevalence rate of 67.8% was documented among the Orang Asli primary school children (Al-Mekhlafi et al. 2007). The overall prevalence of ascariasis in children in Pos Lenjang, Pahang was 42.3% (Hartini & Kamel 2010). Amongst children and older community living in the vicinity of the Crocker Range Park Sabah, prevalence rate of *A. lumbricoides* infection was 8.7% and was highest among children aged between 1-10 years old (Nor Aza et al. 2003). *Ascaris lumbricoides* infection was recorded at 29.2% in three different aboriginal villages in Perak (Sinniah et al. 2012). Previous studies have shown that the prevalence of ascariasis slowly declined in communities where good and safe environmental sanitation have been provided, practiced or when the resident's socio-economic status improved (Chan 1992; Arfaa et al. 1977 ; Norhayati et al. 1998).

Studies have also proven that by moving people from unhygienic condition to a better environmental condition without changing their economic status has significantly reduced the prevalence of soil-transmitted helminthes, including *A. lumbricoides* infection (Che Ghani

et al. 1989). A study done in villages in rural area in Malaysia indicated that provision of both piped water and improved sanitation has prevented the occurrence of ascariasis regardless of other socio-economic background of the community (Che Ghani & Oothuman 1991). In this study, the location of study was located near the Kuala Kubu Bharu town. The condition of the school was clean and equipped with treated piped water and good sanitation. Despite that, ascariasis remains prevalent and this could be attributed to the fact that the infection might have taken place elsewhere. Most of the students come from several smaller villages throughout the district of Hulu Selangor where the basic amenities were lacking. A lack of awareness on good hygienic care and personal hygiene may play important roles in the contracting the infection. Hence, there is a need for awareness campaigns in mass scale about health and hygiene in order to reduce Ascaris infections (Ngui et al. 2015).

Gender was not a significant risk factor for *Ascaris* infection (AI-Eissa et al. 1995; Desiyanti et al. 2017). However, a study in India showed a significant association between gender and of *Ascaris* intensity of infection (Elkins et al 1988). In this study, there is a difference in the prevalence rate of ascariasis among males compared to female school children, in which males were found to have a higher prevalence rate compared to females. More studies need to be done to determine ascariasis prevalence among aboriginal children in the more urbanized area with cleaner environment and better sanitation compared to the more rural aboriginal villages.

CONCLUSION

From this study, it can be concluded that the prevalence of ascariasis is still high among aboriginal school children although they lived in a more urban area with better amenities. More studies on parasitic infestations need to be carried out among urban aboriginal children at different places in Malaysia.

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