



Neglected Tropical Diseases among Two Indigenous Subtribes in Peninsular Malaysia: Highlighting Differences and Co-Infection of Helminthiasis and Sarcocystosis

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Abstract

Soil-transmitted helminth (STH) infections have been documented among these minority groups since 1938. However the prevalence of STH is still high among these communities. Most studies tend to consider the Orang Asli (indigenous) as a homogenous group. In contrary, different subtribes have their own cultural practices. To understand this variation better, we studied the prevalence and associated factors of STH and other gut parasitic infections among two common subtribes (i.e. Temuan and Temiar). Results showed that the prevalence of the overall STH infections was higher in the Temuan subtribe (53.2% of 171) compared to the Temiar subtribe (52.7% of 98). *Trichuris trichiura* (46.2%) was the most prevalent parasite in the Temuan subtribe, followed by *Ascaris* spp. (25.7%) and hookworm (4.1%). In contrast, *Ascaris* spp. (39.8%) was more prevalent among the Temiar subtribe, preceded by *T. trichiura* (35.7%) and finally hookworm (8.3%). There were also co-infections of helminthiasis and intestinal protozoa among both Temuan and Temiar subtribes with rates being three times higher among the Temiar compared to Temuan. The most common co-infection was with *Entamoeba histolytica/dispar/moshkovskii* (n = 24; 24.5%, 16.0–33.0), followed by *Giardia* spp. (n = 3; 3.1%, –0.3–6.5). In Temuan, STH infection individuals were also infected with *Entamoeba histolytica/dispar/moshkovskii* (n = 11; 6.4%, 5.0–13.8), *Cryptosporidium* spp. (n = 3, 1.8%, –0.2–3.8) and *Giardia* spp. (n = 2, 1.2%, –0.4–2.8). In comparison, there was no *Cryptosporidium* spp. detected among the Temiar. However, it was interesting to note that there was an occurrence of co-infection of intestinal helminthiasis and sarcocystosis (intestinal) in a Temiar individual. The last report of sarcocystosis (muscular) among the Orang Asli was in 1978. The present study highlighted the importance of understanding the variation of infections amongst the different Orang Asli subtribes. It is vital to note these differences and use this knowledge to customise effective control measures for the various subtribes.

Citation: Lee SC, Ngui R, Tan TK, Muhammad Aidil R, Lim YAL (2014) Neglected Tropical Diseases among Two Indigenous Subtribes in Peninsular Malaysia: Highlighting Differences and Co-Infection of Helminthiasis and Sarcocystosis. PLoS ONE 9(9): e107980. doi:10.1371/journal.pone.0107980

Editor: David Joseph Diemert, The George Washington University Medical Center, United States of America

Received: April 7, 2014; **Accepted:** August 19, 2014; **Published:** September 23, 2014

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Data Availability: The authors confirm that all data underlying the findings are fully available without restriction. All relevant data are within the paper.

Funding: This research work was funded by the University of Malaya Postgraduate Research Grant (PV024/2011B) (YALL), E-Science (16-02-03-6034) (YALL) and UM/MoHE High Impact Research (H-20001-00-E000061) (YALL) grants. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Competing Interests: The authors have declared that no competing interests exist.

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Introduction

Soil-transmitted helminth (STH) infections are among the neglected tropical diseases that are highly prevalent among the indigenous (Orang Asli) of peninsular Malaysia [1,2]. The Orang Asli constitutes approximately 0.6% of the national population and comprises 18 subtribes which are broadly classified under three major ethnolinguistic categories (i.e. Negrito, Senoi and Aboriginal Malay) [3]. The largest group of Orang Asli is Senoi, followed by Aboriginal Malay and Negrito. Generally, Senoi tribe is further divided into Temiar, Semai, Mah Meri, Che Wong, Ja Hut and Semoq Beri, whilst Aboriginal Malay consists of Temuan, Semelai, Temok, Jakun, Orang Kanaq and Orang Seletar and finally Negrito includes Kintaq, Lanok, Kensi, Jahai, Mendriq and Beteq. Most of these indigenous communities work as swidden cultivators, hunters, collectors of forest resource, fishermen and wage labours [4]. Although the earliest record of STH infections

(i.e., *T. trichiura*, *Ascaris* spp., hookworm) among the Orang Asli was more than 75 years ago [5], it is appalling to note that some of the recent studies have shown that these infections have failed to decline significantly with some indicating a prevalence rate of 100% [6].

Another important health concern among the Orang Asli is the high occurrence of multiparasitism in these communities. Co-infections of soil-transmitted helminth with a diversity of protozoa such as *Giardia* sp., *Entamoeba* spp., *Blastocystis* spp. and microsporidia with prevalence ranging from 15.0 to 22.2% have been observed [7–9]. Multiparasitism has proven to increase anaemia, morbidity and reduce cognitive development in children [10–12].

Aside from the common intestinal parasites mentioned above, there are some minor intestinal parasites that have been detected sporadically among the Orang Asli communities. These included