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EPIDEMIOLOGY STUDY OF *Giardia duodenalis* INFECTION AMONG ORANG ASLI SCHOOL CHILDREN IN SEKOLAH KEBANGSAAN PENDERAS, PAHANG

By

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DECLARATION

I hereby declare that this thesis is my original work and has not been submitted previously or currently for any other degree at UiTM or any other institutions.

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ABSTRACT

Giardia duodenalis is a flagellate parasite which has been considered as the most common protozoa infecting human worldwide with high prevalence in developing countries, including Malaysia. It can infect small and large intestine of vertebrae hosts such as humans, cats, dogs and cattle. The clinical manifestations of giardiasis in humans are highly variable ranging from the absence of symptoms to acute or chronic diarrhoea. There are many risk factors that play role in the transmission of *G. duodenalis* such as faecal-oral, food-borne and water-borne transmissions. Thus, the present study was carried out to determine the prevalence of *G. duodenalis*, possible risk factors and association of clinical manifestations with giardiasis. A cross-sectional study was conducted between Mac 2014 and July2015 in Sekolah Kebangsaan Penderas, Pahang. Stool samples were collected from 89 children of whom 47 boys and 42 girls. All stool samples were processed with Wheatley's trichrome staining technique for the identification of *G. duodenalis* cysts and/or trophozoites. Socioeconomic data were collected through a pre-tested questionnaire and further analyzed using Pearson Chi-square, univariate and logistic regression analyses to identify the possible risk factors and clinical manifestations for *G. duodenalis* infection. The overall prevalence of *G. duodenalis* was 14.61% (13/89). In this study, girls have higher chance of being infected with *G. duodenalis* as compared to boys with a ratio of 2.5:1. Furthermore, there was no significant different between *G. duodenalis* and age groups. Likewise, the present study also found no statistically significant between risk factors with this parasite. In addition, no significant association was found between giardiasis with diarrhoea ($p = 0.053$) and other gastrointestinal symptoms ($p = 0.494$). More studies need to be carried out in order to get better understanding on risk factors and clinical manifestations of *G. duodenalis*. The infection of *G. duodenalis* can be controlled by improving the quality of education especially on health education, efficient provision of adequate sanitary facilities and sewage disposal, regular health screening and giving treatment for those get infected also can help in minimizing the transmission of *G. duodenalis*. It is strongly suggested to perform a highly sensitive, specific molecular technique besides microscopic examination to identify up to assemblages.

CHAPTER 1
INTRODUCTION

Giardia is a genus of parasitic protozoan that infects the small and large intestine of a broad range of vertebrate hosts. This parasite considered among the most common human intestinal protozoa, especially in the tropics (Thompson, 2000). *Giardia* is discovered by Leeuwenhoek soon after the invention of microscope in 1681. It was then described the morphological precisely (Lambl, 1859). Nowadays, *Giardia* is one of the protozoa that extensively studied. This is because it is single-celled parasite.

Giardia is a genus of intestinal flagellates that will infects a wide range of vertebrate hosts. The genus are comprises of six species, namely *Giardia agilis* in amphibians, *Giardia ardeae* and *Giardia psittaci* in birds, *Giardia microti* and *Giardia muris* in rodents and *Giardia duodenalis* in mammals. These species are distinguished based on the morphology and ultrastructure of their trophozoites (Adam, 2001; Shalaby *et al.*, 2011). However, *G. duodenalis* which also known as *G. intestinalis* or *G. lamblia* is the only species that is found in humans and mammals such are pets and livestock (Thompson, 2004; Shalaby *et al.*, 2011).

At present, eight *G. duodenalis* assemblages (A-H) were recognized, infecting a range of mammalian hosts and likely representing as many distinct species (Huey *et al.*, 2013). Most studies that have applied molecular methods to *G. duodenalis* in wild mammals have found that samples fall into assemblage A or B, which characteristically infect people, concluding that the animal hosts involved may represent reservoirs of infection for humans (Huey *et al.*, 2013; Anuar *et al.*, 2014).

According to World Health Organization (1996) about 200 million people in Asia, Africa and Latin America, have symptomatic giardiasis with some 500,000 new cases reported each year. It is suggested that giardiasis is responsible for 2.5 million