Intestinal Parasitic Infections in Thai Patients: Five-Year Experiences at Siriraj Hospital

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ABSTRACT

Objective: To determine the prevalence of intestinal parasitic infections at Siriraj Hospital

Methods: 4,206 non-repeat stool samples (817 from HIV infected patients, and 3,389 from non-HIV infected patients) were submitted for coproparasitological examination between August 2000 and July 2005. All stool specimens were examined for ova and parasites, using simple wet-preparation and formal-ether concentration. Modified Ziehl-Neelson, and modified Trichrome-blue staining were tested routinely only in HIV infected patients.

Results: Intestinal parasites were detected in 18.9 % (41% in HIV infected group and 13.6% in non-HIV infected group respectively). *S. stercoralis* was the most prevalent intestinal parasite found in both groups (6.5 % in HIV infected and 5% in non-HIV infected group). The prevalence of *C. parvum* infection and microsporidial infection were 20.7% and 15.5% in the HIV infected group respectively.

Conclusion: Intestinal parasitic infections remain an important problem in Thailand.

Keywords: Intestinal parasites; formol-ether concentration; modified Ziehl-Neelson staining; modified Trichrome-blue staining

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Intestinal parasitic infections have been an important problem in tropical and developing countries because of inadequate sanitation and unhygienic living condition, and insufficient and contaminated food supplies which can contribute to the spread and increase in the prevalence of intestinal parasitic infection. Additionally, the presence of HIV infection has increased the susceptibility to intestinal parasites among the infected HIV population more than in the general population due to the low natural immune response of the HIV population. Many types of helminths and protozoan parasites affect humans, provoking a wide range of symptoms that are generally associated with the gastrointestinal tract and which cause morbidity and mortality in patients.

Opportunistic protozoan parasites like *Cryptosporidium parvum, Isospora belli* and two important species of microsporidial spore, *Enterocytozoon bieneusi* and *Encephalitozoon intestinalis*, which are mainly associated with severe acute and chronic diarrhea, have been reported in HIV patients worldwide, whereas these have only caused self-limited diarrhea in non-HIV patients[1,2].

Nematode infections such as strongyloidiasis and hook worm disease are also highly prevalent among both groups of patients[2,3]. Therefore, the aim of this study was to determine the prevalence of intestinal parasitic infections in Thai patients admitted to Siriraj Hospital over a five-year period.

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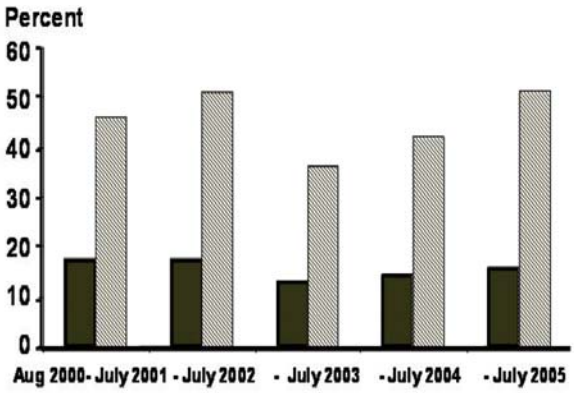

Fig1. The percentage of intestinal parasites found from fecal samples of non-HIV infected patients (black box) and HIV-infected patients (light box) during the 5-year study period.

MATERIALS AND METHODS

The result of all stool ova and parasite examinations performed between August 2000 and July 2005 at The Division of Infectious Disease and Tropical Medicine, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University were reviewed retrospectively. All stool specimens were obtained within 24 hours of passing. A direct saline smear was examined from the unpreserved stool samples followed by microscopy of a deposit from the formol-ether (FE) concentration method.

TABLE 1. Pathogenic and non pathogenic parasites detected during the study period.

	Non-HIV (n=3,389)	HIV (n= 817)	Total (n= 4,206)
Pathogenic			
- *Strongyloides stercoralis*	171	53	224
- *Cryptosporidium spp.*	0	169	169
- *Opisthorchis viverrini*	83	18	101
- Hookworm	78	7	85
- Microsporidium spp	0	76	76
- *Giardia lamblia*	27	21	48
- *Isospora belli*	4	52	56
- *Entamoeba histolytica/dispar*	8	1	9
- *Enterobius vermicularis*	11	4	15
- *Capillaria phillipinensis*	9	0	9
- *Taenia spp.*	2	0	2
- *Trichuris trichiura*	7	1	8
- *Ascaris lumbricoides*	2	1	3
- *Cyclospora spp.*	0	6	6
- *Fasciola spp.*	2	0	2
Non-pathogenic			
- *Blastocystis hominis*	136	13	149
- *Trichomonas hominis*	11	1	12
- *Entamoeba nana/ E. coli*	9/3	0/2	9/5
Total parasite	561	425	986

Modified Ziehl-Neelson (MZN) and modified Trichrome-blue staining (MTB) smears were also prepared from the deposit of FE stool specimen from HIV infected patients. For the purpose of this study, non-pathogenic parasites (such as *Entamoeba coli*) were also reported in order to demonstrate that the laboratory could detect and differentiate them from morphologically similar pathogens. *Blastocystis hominis* was also included despite of its uncertain pathogenicity in humans. Statistical significance was determined using the chi-square test. A difference between proportions was considered to be significant if P 0.05.

RESULTS

Of the 4,206 subjects examined; 2,738 (65.1%) were female and 1,468 (34.9%) were male. Simple saline smear and FE concentration examination were conducted in 82.2% of stool samples. MZN staining and MTB staining were done in 817 and 490 stool samples from HIV infected patients respectively. Overall 18.9% of the patients were infected with various types of pathogenic and non-pathogenic intestinal parasites. Mixed parasitic infections were detected in 56 patients. The prevalence of parasitic pathogens was similar during the 5- year study period (figure 1). Infection rates among HIV seropositive (44.9%) were significantly higher than that in non-HIV infected patients (15.6%, P<0.001). Helminthic infection was found in 8.9% of both groups, however the protozoan infections in the HIV- infected group (29.6%) were significantly higher than in the non-HIV infected group (3.9%, P<0.001). The distribution of helminth and protozoan infections compared between HIV and non-HIV infected groups are shown in Table 1. Strongyloides stercoralis was the most prevalent intestinal nematode found in both groups (6.5 % in HIV infected and 5% in non-HIV infected group). *Cryptosporidium parvum* and *Microsporidium spp.* were found in 20.7% and 15.5% of the HIV-infected group respectively. *Isospora belli* was detected in 4 non-HIV infected patients.

DISCUSSION

The results of this study showed that intestinal parasitic infection remains a common problem in Thailand. The detection rates of intestinal parasitic infections were stable during this 5- year study period. The prevalence of intestinal parasitic pathogens was reported as 6.1 % in 2001 in Thai workers seeking overseas employment[2]. However the intensity of infection was lower because only 173 intestinal pathogens were only detected by the FE concentration examination. This finding indicates that the FE concentration examination should be routinely performed. The prevalence of helminth infection was similar between the HIV and non-HIV infected group and strongyloidiasis was the predominant helminthic infection in both groups. *S. stercoralis* and *O. viverrini* remain the two most common parasites found in this country[1,3,4]. The prevalence of strongyloidiasis was similar to those previously reported[2]. Intestinal parasites were reported in 27 of 82 (33%) HIV-infected and 12 of 80 (15%) non-infected children with diarrhoea in 2001[1]. We did not find any *Cryptosporidium* spp. in non-HIV infected patients. Therefore since July 2002, MZN was performed only in the HIV-infected group. Cryptosporidiosis and Microsporidiosis continue to be the two most common protozoan infections in the HIV-infected group[5,6]; the prevalence of cryptosporidiosis was between 9 - 20% in HIV-infected patients with chronic diarrhoea.The reduction in the prevalence of cryptosporidiosis was reported in other countries due to the use of HAART[7]. Although antiretroviral treatment has been widely available in Thailand since 2003, the majority of patients received a combination of 3TC, d4T, and nevirapine. The protease inhibitor was not routinely used in this country. This may explain the higher prevalence of these protozoan infections over time, especially for cryptosporidiosis found in this study. Also, this study indicated that screening for parasitic infections both in uninfected-and infected HIV patients is necessary and help to decrease the mortality in patients. Moreover, it can provide the basic epidemiological knowledge of intestinal parasitic infection in our country.

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บทคัดย่อ

การติดเชื้อปรสิตในลำไส้ในผู้ป่วยโรงพยาบาลศิริราช: ประสบการณ์ 5 ปี

ดวงดาว เววา วทม., เสาวลักษณ์ ศิลปสาคร วทบ., อาทิตย์ พุงไธสง ป.พนักงานวิทยาศาสตร์การแพทย์, ยุพิน ศุพุทธมงคล พบ.
สาขาวิชาโรคติดเชื้อ ภาควิชาอายุรศาสตร์, คณะแพทยศาสตร์ศิริราชพยาบาล, มหาวิทยาลัยมหิดล, กทม. 10700, ประเทศไทย.

วัตถุประสงค์: เพื่อศึกษาอัตราการตรวจพบเชื้อปรสิตในลำไส้จากการตรวจอุจจาระผู้ป่วยที่โรงพยาบาลศิริราช
วัสดุและวิธีการ: ทบทวนผลการตรวจอุจจาระจากผู้ป่วยทั้งหมด 4,206 ราย ซึ่งส่งตรวจระหว่างเดือนสิงหาคม พ.ศ. 2543 และ เดือนกรกฎาคม พ.ศ. 2548 โดยตัวอย่างอุจจาระดังกล่าวได้รับการตรวจหาเชื้อปรสิตในลำไส้โดยวิธี simple wet and formol-ether concentration. อุจจาระจากผู้ป่วยกลุ่มติดเชื้อเอชไอวีจะได้รับการตรวจด้วยการย้อมสี Modified Ziehl-Neelson (MZN), and modified Trichrome-blue staining (MTB) ด้วย
ผลการศึกษา: อัตราการพบการติดเชื้อปรสิตในลำไส้โดยเฉลี่ยร้อยละ 18.9 (ร้อยละ 41 ในกลุ่มผู้ป่วยติดเชื้อเอชไอวีและร้อยละ 13.6 ในผู้ป่วยปกติ) *S. stercoralis* เป็นปรสิตที่พบมากที่สุดในผู้ป่วยทั้งสองกลุ่ม (ร้อยละ 6.5 ในกลุ่มผู้ป่วยติดเชื้อเอชไอวีและร้อยละ 5 ในผู้ป่วยปกติ) และกลุ่มผู้ป่วยติดเชื้อเอชไอวี ตรวจพบการติดเชื้อ *C. parvum* และ *Microsporidium spp.* ร้อยละ 20.7 และร้อยละ 15.5 ตามลำดับ
สรุป: การติดเชื้อปรสิตยังคงเป็นปัญหาสาธารณสุขที่สำคัญในประเทศไทย