ความชุกของปรสิตในลำไส้คนบ้านปางสา อำเภอศรีสัชนาลัย จังหวัดสุโขทัย

Prevalence of intestinal parasites in people of Ban Pang Sa, Satchanalai District, Sukhothai Province

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บทคัดย่อ

การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อประเมินความชุกของการติดเชื้อพยาธิของคนในบ้านปางสา อำเภอศรีสัชนาลัย จังหวัดสุโขทัย ในช่วงเดือนมีนาคม ปีพุทธศักราช 2554 เก็บตัวอย่างอุจจาระจาก 80 คน อายุของประชากรที่ได้รับการตรวจตั้งแต่ 4-80 ปีตรวจหาพยาธิด้วยวิธีการตรวจแบบง่าย แล้วยืนยันผลด้วยวิธีเข้มข้น formalin-ethyl acetate concentration technique ผลการศึกษาพบว่ามีความชุกของโรคพยาธิในลำไสน 8.75 เปอร์เซ็นต์ พยาธิๆที่พบได้แก่ พยาธิเส้นด้าย (*Strongyloides stercoralis*) และพยาธิใบไม้ลำไส้ขนาดเล็ก พบได้ถึง 5 เปอร์เซ็นต์ ในขณะที่ความชุกของพยาธิตืดพบเพียง 1.25 เปอร์เซ็นต์ พบอัตราการติดพยาธิในเพศชาย (13.88 เปอร์เซ็นต์) สูงกว่าการติดพยาธิในเพศหญิง (4.55 เปอร์เซ็นต์) ผู้ที่ติดพยาธิทุกรายได้รับการรักษาด้วยยาฆ่าพยาธิและให้สุขศึกษา นอกจากนี้ยังมีการตรวจหาไข่พยาธิเข็มหมุดในเด็กด้วยเทคนิคเทปใส พบว่า 27 จาก 58 คน (46.55 เปอร์เซ็นต์) ติดพยาธิเข็มหมุด พบอัตราการติดพยาธิเข็มหมุดสูงสุดในช่วงอายุ 1-4 ขวบ (83.33 เปอร์เซ็นต์) การศึกษาในครั้งนี้แสดงให้เห็นว่าโรคพยาธิเข็มหมุดมีความชุกสูง ควรมีการรักษาแบบให้ยาทุกคน

คำสำคัญ: พยาธิเข็มหมุด พยาธิเส้นด้าย พยาธิใบไม้ลำไส้ขนาดเล็ก พยาธิตืด จังหวัดสุโขทัย

Abstract

The objective of this study was to determine the prevalence of parasitic infections in people of Ban Pang Sa, Si Satchanalai District, Sukhothai Province during March 2011. Eighty fecal samples were collected, examined by simple smear technique and confirmed by formalin-ethyl acetate concentration technique. The age of the population examined ranged from 4 to 80 years. It was found that the overall prevalence of intestinal parasitosis was 8.75%. Different species of intestinal parasites were found; *Strongyloides stercoralis* and minute intestinal fluke (MIF) was the most common parasite (5.00%), whereas *Taenia* spp. had a prevalence of 1.25%. Regarding the gender of the infected individuals, infection rate in males (13.88%) was higher than females (4.55%). The highest infection rate was 25.00% in the 21-30 age group. All infected cases were treated with anti-helminthic drug and health educated. In addition, the cellophane tape technique was used for isolating pinworm eggs in schoolchildren. It was found that

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27 out of 58 children (46.55%) were positive. The highest infection rate (83.33%) was found in 1-4 age group. In the present study, high prevalence of enterobiasis was demonstrated. This suggests that the mass treatment to control this infection is needed in the study area.

Keywords: *Enterobius vermicularis*, *Strongyloides stercoralis*, Minute intestinal fluke (MIF), *Taenia*, Sukhothai Province

Introduction

Parasitic infections are among the most common infectious diseases worldwide and remain an important public health problem. The effects of intestinal parasite infections vary according to species and burden of infection. Several studies indicate that parasitic infections cause malabsorption, diarrhea, and other states of poor health.[1-3] The high prevalence of intestinal parasites in any population is related to parasitic contamination of the soil, water sources and food by feces in addition to deficient sanitary and sociocultural conditions.[4]

Enterobius vermicularis or pinworm is an important helminthic infection among children in the rural areas of developing countries.[5] Female worms crawl to the rectal area at night to lay eggs, causing the infected person to itch and to sleep restlessly.[6] The eggs are recovered by using the 'Scotch' tape technique and can be observed under a microscope.[7] Research further indicated that the prevalence of enterobiasis did not correlate with the sex of the infected children[8], but was related more to environmental conditions and the children's hygiene practices.[9] Individual hygiene and health practices were the most important factors influencing research results. Children who have poor hygiene and health practices,such as not washing their hands before meals, poorly groomed fingernails, sucking their fingers, and not wearing clean clothes, have a higher risk of enterobiasis.

Ban Pang Sa of Si Satchanalai is the northernmost district of Sukhothai Province, northern Thailand and is located 427 kilometers north of Bangkok. The number of population of Si Satchanalai district was 95,198 in 2005. The provincial economy is based on agriculture.

The objectives of this study are to determine the prevalence of intestinal parasitic infections in peoples and to determine the egg positive rate of pinworm infection in children in Si Satchanalai district, Sukhothai Province.

Materials and Methods

A survey of intestinal parasites was carried out in Ban Pang Sa,eSi Satchanalai District, Sukhothai Province. A total of 80 fecal sample, 36 men and 44 women; ag, 4 - 80 year old were collected. All samples underwent preliminary diagnosis by direct smear microscopy or simple smear technique at Pang Sa school. In brief, a drop of 0.85% NaCl was placed on a clean slide. The appropriate amount of fecal specimens was transferred by using an applicator stick on the slide. The mixture between fecal material and normal saline solution was covered by coverslip and examined under light microscope.For confirmation test, the fecal samples were then processed by formalin-ethyl acetate sedimentation techniqueoin the Department of Microbiology and Parasitology, Faculty of Medical Science, Naresuan University.e. In brief, stool approximately 4 gram was mixed with 10 ml of 10% formalin. The mixture was filtered through a muti-layer or wet gauze into a conical 15 ml centrifugation tube and was centrifuged at 3000 rpm for 2 minute. After discard the supernatant, the sediment was resuspended with 7 ml of 10% formalin. Then 3 ml of ethyl acetate was added, and shake vigorously. After the tube was centrifuged at 3000 rpm for 2 minute, four layers were indicated as a small amount of sediment in the bottom of the tube, a layer of formalin, a plug of fecal debris on top of the formalin layer and a layer of ethyl acetate at the top. The plugs of debris were ringing by using applicator stick and discarded. All supernatant fluid was also decanted. The sediment containing parasites was ready examined under light microscope.

A survey of *Enterobius vermicularis* was conducted in Pang Sa school of Si Satchanalai district, Sukhothai Province. Fifty-eight children were included in this study. The diagnosis was made by the cellophane tape technique. The adhesive side of the cellophane tape

swab is placed on the perianal skin, pulled off and placed, adhesive side down, on a labeled glass microscope slide. The slides are then observed under the light microscope for the presence of *E. vermicularis* eggs. All infected children were then treated with albendazole.

Results

A total of 7 of 80 people (8.75%) were found to be positive for intestinal parasites (Table 1 and Figure 1). Different species of intestinal parasites were detected during this survee. 5% for *Strongyloides stercoralis* and Minute Intestinal Fluke (MIF) and 1.25% for *Taenia* spp. A total of 27 (46.5%) of the 58 children were found to be positive for pinworm eggs (Table 2).

Discussion and Conclusion

In the present survey, the overall prevalence of intestinal parasitic infection was 8.75% (7/80).iInfection rate in males (13.88%) was higher than females (4.55%). High infection rate (25.00%) was found in 21-30 years old age group. Different species of intestinal parasites were detected during this survey: *Strongyloides stercoralis* and Minute Intestinal Fluke seemed to be the most common parasite (5.00%), whereas *Taenia* spp. had a prevalence of 1.25%.

Prevalence of strongyloidiasis was low in the present study. It was consistent with several studies.[11-15] In contrast with previous research carried out in Noen Maprang district, Phitsanulok, they showed higher infection rate of strongyloidiasis (9.59%).[16] This may be due to formalin ethyl-acetate concentration technique has been found to be less effective and sensitive than agar plate culture.[17,18] In addition, low prevalence of taeniasis was demonstrated in this study. It was consistent with other studies.[11,13,15]

Parasitic infections occur worldwide, mainly affecting the poorer sectors of society.[10] Differences between locations may be due to a variety of factors associated with the prevalence of these infections, such as soil composition, climate, and method of transmission, among others. Similarly, socioeconomic and health conditions, education and beliefs related to traditional health practices, as well as the presence of domestic animals in the home and contamination of water and food, have all been reported as factors associated with the presence of diseases[119,22] Intestinal parasite infections are associated with poor physical growth and development, as well as with retardation of intellectual and cognitive development in children.[21,24] The findings of our study suggest that there is a prevalence of intestinal parasitic infections in this area; health education program, personal hygiene, communal sanitation, and eventual treatment of infected people would contribute to the control of this health problem.

In this study *Enterobius vermicularis* infection was found in children of Ban Pang Sa. The overall infection rate was 46.5% (27/58). The results of this study agreed with other findings in Thailand. Using the same method, other studies found that the infection rates were 16.0% in children living in four orphanages at Bangkok and Pathum Thani province[25], 18.7% in students of a rural area in Phichit Province[26], 38.8% in Bang Plee district, Samut Prakarn Province[27] and a high prevalence of 45.4% was found in hill tribe children in Mae Chaem District of Chiang Mai Province.[28]

In terms of children's ages, this study found that the ages of the children affected the rates of infection. The highest rate of infection occurred in children one to four years of age (83.0%); younger children tended to have a higher rate of infection than older children. Considering these results, it is probable that the younger children do not have the ability to follow good hygiene and health practices as well as the older children, who are able to care for themselves.[2].

Our study demonstrated high prevalence of this infection. For this reason, enterobiasis can be found among the children of families of low socioeconomic status[20] and can be found in communities of high population density such as slums[29,32] and institutional settings such as orphanages and schools.[9,33] Population density and personal hygiene were significant factors in the distribution and prevalence of infection. This infection affects both the general health and the intellectual development of children.[20] The results of the present study indicated that pinworm infection continues to be

highly prevalent. Therefore, education of both children and parents about personal hygiene is needed to halt continued infections.

In conclusion, low prevalence of strongyloidiasis, taeniasis and minute intestinal fluke infection and high infection rate of enterobiasis were demonstrated in this study. However, control and prevention of parasites are still needed to reduce the transmission. Multidisciplinary approaches including a proper financial resources and public heath structures, reduction of parasite burden, action on the animal reservoirs and vectors, improved diagnostic tools and broader use of diagnostic test, environmental and ecological changes, human behaviors and education and international cooperation were suggested to obtain the successful control and prevention parasites.

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Table 1: Intestinal parasitic infections among age groups and gender of people in Ban Pang Sa, Si Satchanalai District, Sukhothai province.

Age (year)	Infection rate (%)		
	Male (No. positive/No. examined)	**Female (No. positive/No. examined)**	**Total (No. positive/No. examined)**
1-10	0/1 (0.00)	0/1 (0.00)	0/2 (0.00)
11-20	0/3 (0.00)	0/1 (0.00)	0/4 (0.00)
21-30	1/1 (100.00) *,**	1/7 (14.29) **	2/8 (25.00)
31-40	1/9 (11.11) ***	0/12 (0.00)	1/21 (4.76)
41-50	1/12 (8.33) **	0/9 (0.00)	1/21 (4.76)
51-60	1/6 (16.66) *	1/8 (12.50) *	2/14 (14.29)
61-70	1/3 (33.33) *,**	0/4 (0.00)	1/7 (14.29)
71-80	0/1 (0.00)	0/2 (0.00)	0/3 (0.00)
Total	5/36 (13.88)	2/44 (4.55)	7/80 (8.75)

Note: * *Strongyloides stercoralis* ** Minute Intestinal Fluke (MIF) *** *Taenia* spp.

Table 2: The *E. vermicularis* infection rate among age groups of children in Pang Sa school, Si Satchanalai District, Sukhothai Province.

Age (year)	Infection rate (%)		
	Boy (No. positive/No. examined)	**Girl (No. positive/No. examined)**	**Total (No. positive/No. examined)**
1-4	2/3 (67)	3/3 (100)	5/6 (83)
5-8	10/14 (71.43)	2/7 (28.57)	12/21 (57.14)
9-12	4/14 (28.57)	6/16 (37.50)	10/30 (33.33)
>12	0/1 (0)	0/0 (0)	0/1 (0)
Total	16/32 (50.00)	11/26 (42.31)	27/58 (46.55)

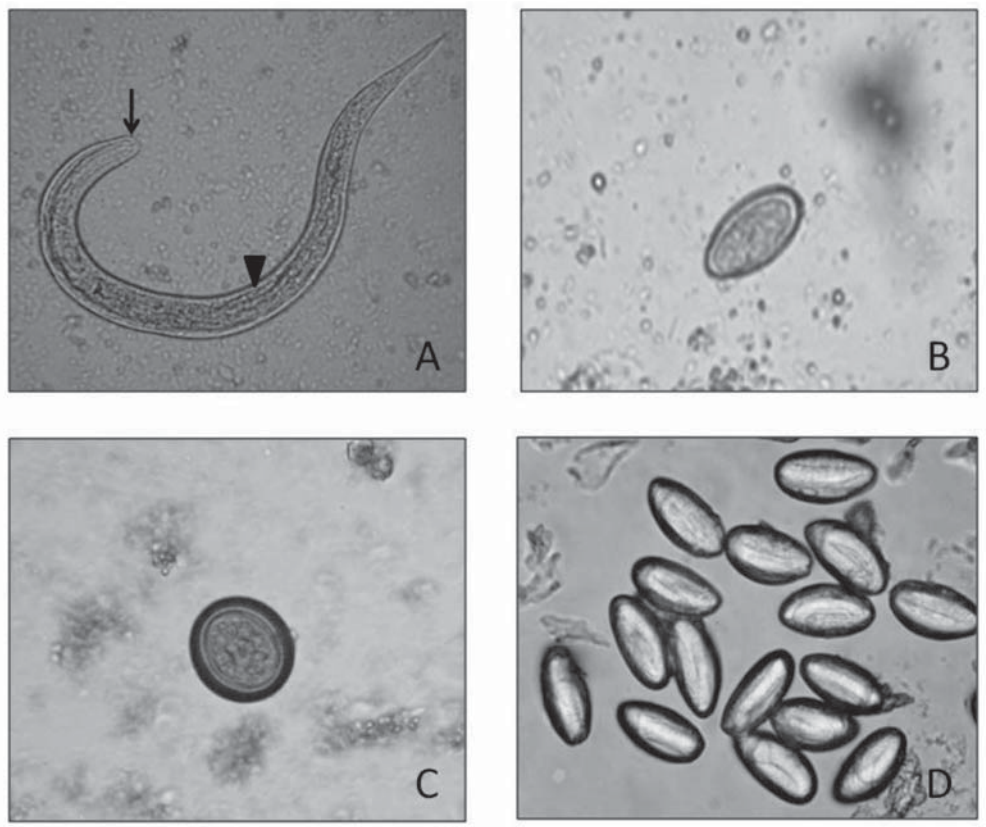

Figure 1 Parasites collected from intestinal human: Rhabditiform larva of *Strongyloides stercolaris* (A) showing short buccal cavity (arrow) and prominent genital primordium (arrowed head), Minute intestinal fluke egg (B), *Taenia* spp. egg (C) and pinworm eggs (D).