SCHISTOSOMA JAPONICUM-LIKE INFECTION IN PHICHIT PROVINCE, NORTHERN THAILAND: A CASE REPORT

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INTRODUCTION

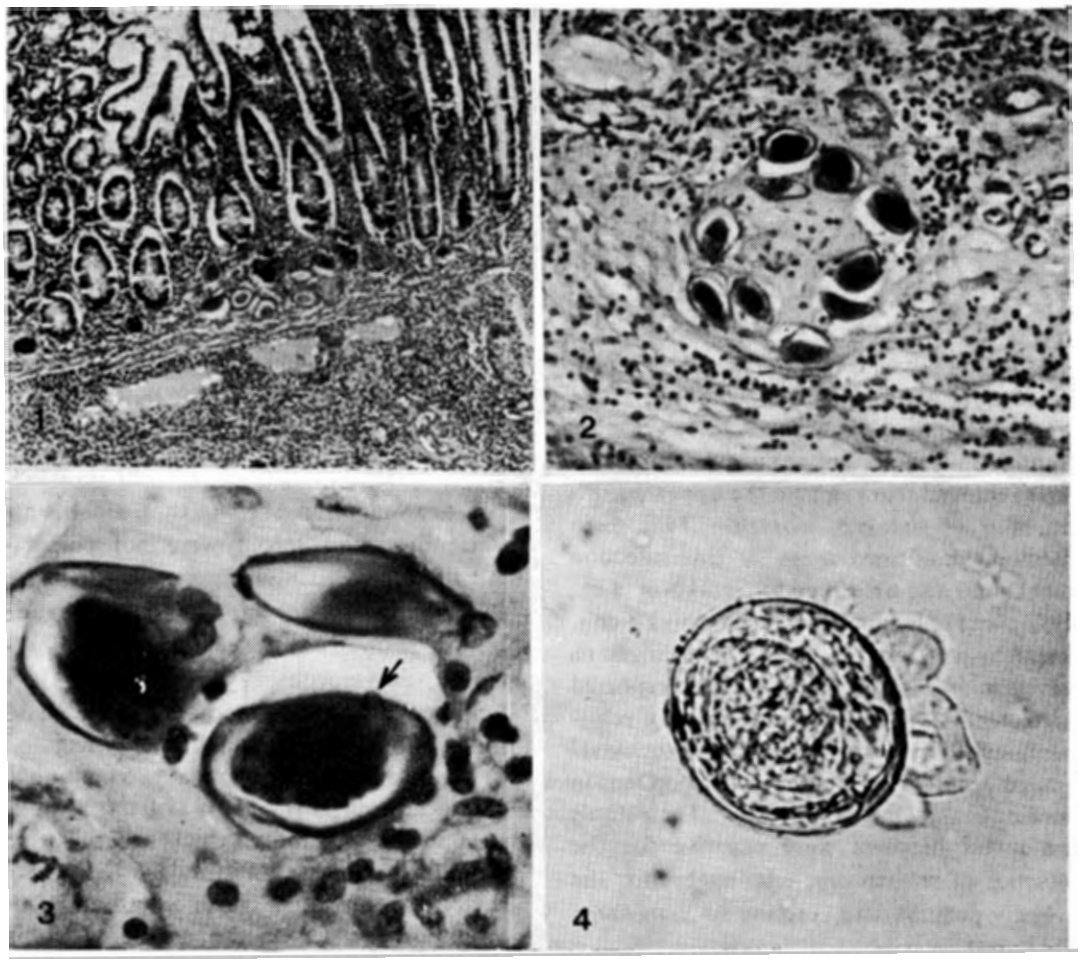
The first case of human schistosomiasis in Phitsanulok province, 500 kilometers north of Bangkok was reported in 1966 (Lee *et al.*, 1966). *Schistosoma japonicum*- like eggs were found within the eosinophilic granulomatous mass removed from behind the upper mandible of a 64-year-old woman. Two more histologic-confirmed cases of this infection were found and described by Sarakoon *et al.*, (1975) and Shuangshoti (1978) in Phichit, a near-by province. During a schistosomiasis survey in 1979-1980, Bunnag *et al.*, reported thirteen isolated cases of presumptive schistosomiasis discovered by the circumoval precipitin test (COPT) among the population residing in six villages of Phichit. Their stools and rectal biopsies were negative for the presence of schistosome eggs except for the strongly positive sera reaction to *S. mekongi* eggs.

These findings provide evidence that this province is a potential endemic area for schistosomiasis. This paper reports another case of schistosomiasis japonica-like in Phichit.

A Case report

A 44-year-old Thai female, native of Sak-Lek, Muang district, Phichit, was admitted to Phitsanulok provincial hospital on October 1982 with the chief complaint of acute abdominal pain. She experienced many episodes of abdominal pain without bloody or mucous stools for the past few years. She denied any jaundice, fever or malaria and had no history of travelling to or living in other provinces. She was born and had been living in another village about 10 kilometers apart where the first case of schistosomiasis reported by Sarakoon *et al.*, resided. She moved out and settled at the present address for the past 10 years.

On examination, she was thin, afebrile and pale; liver and spleen were not palpable. An ill-defined painful mass was palpated at the right lower iliac region. The blood examination showed white cell count of 13,000 c.mm.; polymorphs 49%, eosinophils 34%, lymphocytes 14%, monocytes 2% and basophils 1%. Urine examination was negative. Symptoms were so aggravated resulting in emergency surgical removal of the mass on the day of admission. A thickened, pusty and inflammatory mass was found at ileo-caecal region measuring 10 cm in length along the longitudinal axis of the ascending colon. Microscopic report of the specimen revealed severe acute and chronic inflammatory infiltration comprising abundantly of eosinophils, plasma cells and lymphocytes in the mucosal as well the submucosal layers and the granulomatous lesions were without giant cells. Marked thickening of the submucosal layer showed the presence of multiple, discrete, small granulomas; some contained egg cluster (Figs. 1 & 2). The schistosome ova were, somewhat ovoidal, measuring 57.2 to 48μ by 46.2 to 29 μ (av. 52.2 to 36.4 μ). The dimensions of the ova were smaller than the classical *S. japonicum* and were comparable to *S. mekongi*. Some of the eggs contained well-preserved miracidia in varying degrees of



Figs. 1-4—1 Section of the ascending colon with several schistosome eggs in submucosa. Marked thickening of submucosa consists of a heavy eosinophilic cellular infiltration. 2. Non-caseating granuloma in submucosa with egg cluster 3. Higher magnification showing characteristic eggs with lateral knob-like appearance (Arrow). 4. Negative COPT with *S. mekongi* egg.

degeneration; some had the characteristic lateral knob appearance (Fig. 3).

On several follow-up visits six months later, the patient was apparently in good health. The liver and spleen were not palpable. Specifiic tests for diagnosis were done as follows: Liver function tests were normal, stools were examined by the merthiolate-formalin-ether concentration (MIFC) method on five seperate occasions and contained only hookworm ova. Examinations of stool sample for miracidia (by hatching technique) were negative on several occasions.

Serological tests using the circumoval precipitation test (COPT) using *S. mekongi* and *S. incognitum* antigens were negative (Fig. 4).

DISCUSSION

Among human schistosomiasis cases reported in Thailand, the schistosome eggs

from the present case are similar to those found by rectal biopsy (Chaiyaporn *et al.*, 1959; Harinasuta and Kruatrachue 1962) in subcutaneous tissue of the mandible and small intestine (Lee *et al.*, 1966), in rectal biopsy and fecal smear (Sarakoon *et al.*, 1973) and in serosal of intestine and mesentery, liver biopsy and fecal smear (Nidtayasudhi *et al.*, 1975), but relatively smaller than the classical *Schistosoma japonicum* and geographical strains (Voge *et al.*, 1978; Kitikoon, 1980). This discrepancy is possibly due to the schistosome parasites that exist in Thailand belong to *S. japonicum* complex.

It is also noted that an infection rate of *S. incognitum* in the wild rats was as high as 42% in this area where this case apparently acquired the infection (Bunnag *et al.*, 1983). However, the large, elongate and terminal spined ova of *S. incognitum* rules out the possibility of it being involved in the human case.

Coincidentally this patient was born, and lived in the same village where the first proven case was found in 1973 (Sarakoon *et al.*, 1973). The failure to discover ova and miracidia in the feces with negative sera tests by COPT in this case was similar to a previous survey in which 13 COPT-positive cases yielded negative ova in rectal biopsy and fecal examinations (Bunnag *et al.*, 1984).

However, Bunnag *et al.*, (1980,1984) thus far have failed to discover the schistosome ova from 1974 fecal samples, among 2500 inhabitants residing in 33 villages including this village during their survey on two occasions. Furthermore, examination of 1557 animal reservoir hosts (dog, cat, cattle, pig and water buffalo), 912 wild rodents and 47,083 freshwater snails of 13 different species revealed no infection with this parasite (Bunnag *et al.*, 1980; 1984) Thus, an existence of this disease in this area is obvious. There are two possibilities whether it may indicate either schistosomiasis occurrence in this locality as "asymptomatic" case or a less well adapted human or a zoonotic strain in which worm-load is low with less irregular egg production. Both cases possibly got the infection in their early life during the Japanese invasion in 1941-1945, and the incidental, temporary focus of infection had already died out. However, the pathological findings of the present case were different. Histologically the granulomata consisted predominately of eosinophils and were without multinucleated giant cells and fibrotic change. The eggs seen in the section contained degenerating miracidia indicating that they had been in the tissue for only a few months. These evidences suggested that the lesion is an early acute granuloma (Lauglin, 1984), and the fact that the history obtained on chronic abdominal symptoms could not be related to this illness. The results are not convincing yet whether the disease still exists or this area is a potential active site of transmission of this infection. Surveillance on suspected cases with abdominal mass and/or diagnosed as carcinoma of colon by the clinicians is encouraging since this is an accidental discovery of a histologic-confirmed schistosomiasis case from Phichit Province.

SUMMARY

A case of human schistosomiasis from Phichit Province is presented. Schistosome eggs were found in the ileo-caecal mass of a 44-year old woman, native of Sak-Lek, Muang District. Histologic pictures revealed an early acute granulomatous lesion which consisted of predominantly eosinophils without multinucleated giant cells and fibrotic change suggesting a recent infection. On the basis of the shape and microscopic appearance of the eggs, they are smaller than those described previously for *Schistosoma japonicum*, probably those of *S. mekongi*, a related species. This is the third histologic-confirmed

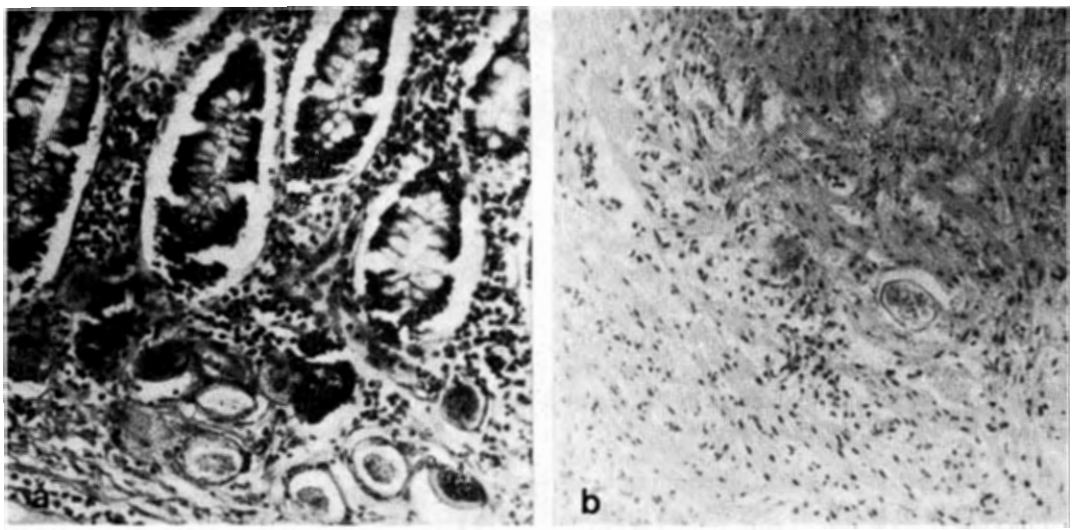


Fig. 5—Sections of rectal biopsy. a) eggs in submucosa showing intact miracidia of varying degrees of degeneration and empty or fragmented shells:. b) higher magnification of submucosal layer showing egg surrounded by lymphocytes, plasma cells, eosinophils and marked fibrotic changes.

case of schistosomiasis in this locality. Addendum : At the time of the manuscript preparation, another case of schistosomiasis was diagnosed. A 55- year old man who lives entirely in the very close adjacent village to the present case was admitted to the Ramathibodi Hospital, Bangkok with chronic hepatosplenomegaly in January 1986. Amyloidosis was suspected and rectal biopsy revealed schistosome eggs, some contained miracidia with varying degrees of degeneration, some were empty and/or fragmented shells and were surrounded with fibrotic changes and chronic cellular infiltration (Fig. 5). They were identical to those of *Schistosoma japonicum*. Several fecal examinations, miracidium hatching and COPT yielded negative results. This finding showed significantly that all schistosomiasis cases reported from this locality, except the second one, were in the old age group of 40 and above. Further epidemiologic investigation is in progress to delineate this locality as a potential endemic area for this infection.

REFERENCES

BUNNAG, T., SORNMANI, S., IMPAND, P. and HARINASUTA, C., (1980). Potential health hazards of the water resources development : A health survey in the Phitsanulok Irrigation Project, Nan River Basin, Northern Thailand. *Southeast Asian J. Trop. Med. Pub. Hlth., 11*:559.

BUNNAG, T., SORNMANI, S. and HARINASUTA, C., (1983). Health reconnaissance with special emphasis on water-borne diseases. Phitsanulok Irrigation Project, Nan River Basin, 1977-1980. Final Report to World Bank pp. 1-57.

BUNNAG, T., THIRACHANDRA, S., IMPAND, P., Vorasanta, P. and IMLARP, S., (1983). *Schistosoma incognitum* and its zoonotic potential role in Phitsanulok and Phichit Provinces, Northern Thailand. *Southeast Asian J. Trop. Med. Pub. Hlth., 14* : 163.

BUNNAG, T., IMPAND, P., THIRACHANDRA, S., KLONGKUMNUANKARN, K., SORNMANI, S. and HARINASUTA, C. (1984). Schistosomiasis survey in Phichit Province : A

potential endemic area in Northern Thailand. *J. Med. Ass. Thailand, 67*: 475.

CHAIYAPORN, V., KOONVISAL, L. and DHARMADHACH, A., (1969). The first case of schistosomiasis japonica in Thailand. *J. Med.Ass. Thailand, 42* : 438.

HARINASUTA, C. and KRUATRACHUE, M., (1962). The first recognised endemic area of bilharziasis in Thailand. *Ann.Trop. Med.Parasit., 56* : 314.

KITIKOON, V., (1980). Comparison of eggs and miracidia of *Schistosoma mekongi* and *S. japonicum. In:* J.I.Bruce, Sornmani, S.; H.L.Asch and K.A. Crawford.(Eds.) The Mekong Schistosome. *Malacol.Rev. Suppl., 2* : 93.

LAUGHLIN. L.W., (1984). Schistosomiasis. *In:* G.T. Strickland (ed.) Hunter's Tropical Medicine, 6th ed. W.B. Saunders Co. Philadelphia, pp. 708-740.

LEE, H.F., WYKOFF, D.E. and BEAVER, P.C., (1966). Two cases of human schistosomiasis in new localities in Thailand. *Amer. J. Trop. Med. Hyg., 15* : 303.

NIDTAYASUDHI, T., JAROONVESAMA, N. and DHARMADHACH, A., (1975). Schistosomiasis from a new locality in Thailand: A case report. *J. Med. Ass. Thailand, 58* : 542.

SARAKOON, S., SRIRATANABAN. A., WILAIRATANA, S., JAMIKORN, P. and NIVATVONGS, P., (1973). A case of human schistosomiasis from a new locality in Thailand. *Chulalongkorn Med. J., 18* : 211.

SHUANGSHOTI, S., (1978). Post mortem experience with schistosomiasis at Chulalongkorn Hospital. *Southeast Asian J. Trop. Med. Pub. Hlth., 9* : 285.

VOGE, M., BRUCKNER, D. and BRUCE, J.I., (1978). *Schistosoma mekongi* sp.n. from man and animals, compared with four geographical strains of *Schistosoma japonicum. J.Parasit., 64* : 577.