2. 地 方 病 科

1) A SUGGESTION ON THE SURVEY OF SCHISTOSOMIASIS ALONG THE LOWER MEKONG

Toshihiko Iijima
(Yamanashi Prefectural Institute of Public Haelth, Kofu)

Introduction

By the survey from Dec. 1966 to Feb. 1967 at Khong Island in Southern Laos, 65 out of 547 inhabitants (11.88%) were found infected with *Schistosoma japonicum*. Considering this fact, the author had mentioned, in the assignment report to WHO, that an extensive survey should be carried out in the whole region of the Mekong including Laos, Cambodia, South Viet Nam and Thailand, with such objectives as making the data on the erosion of the disease, recognizing existence of endemic foci, and confirming an intermediate host. However, when we try to perform the survey in this region, we have to deliberate on very special circumstances not found in any other endemic area of schistosomiasis japonica.

The area of the survey

The Mekong, rising from Tibet through Laos, Cambodia, Thailand and South Viet Nam, pouring down into the South China Sea is a big river of 4,200 km in length. Along its valley, Yünnan Province is one of the districts where the existence of schistosomiasis has long been recognized, and also the Lower Mekong, that is south of Laos, reported the outbreaks of the disease from time to time.

The district north of Vientiane is a steep mountain area which has a very small plain. This condition shows a very little possibility of the existence of the endemic area of schistosomiasis, However, south of Vientiane, the district is a wide plain, where the existence of the endemic area of schistosomiasis is quite possible. Desides, the extensive irrigation schemes by ECAFE have been planned in this district. If the existence of endemic area of the disease is found here, the author convinced, its distribution will soon become wider.

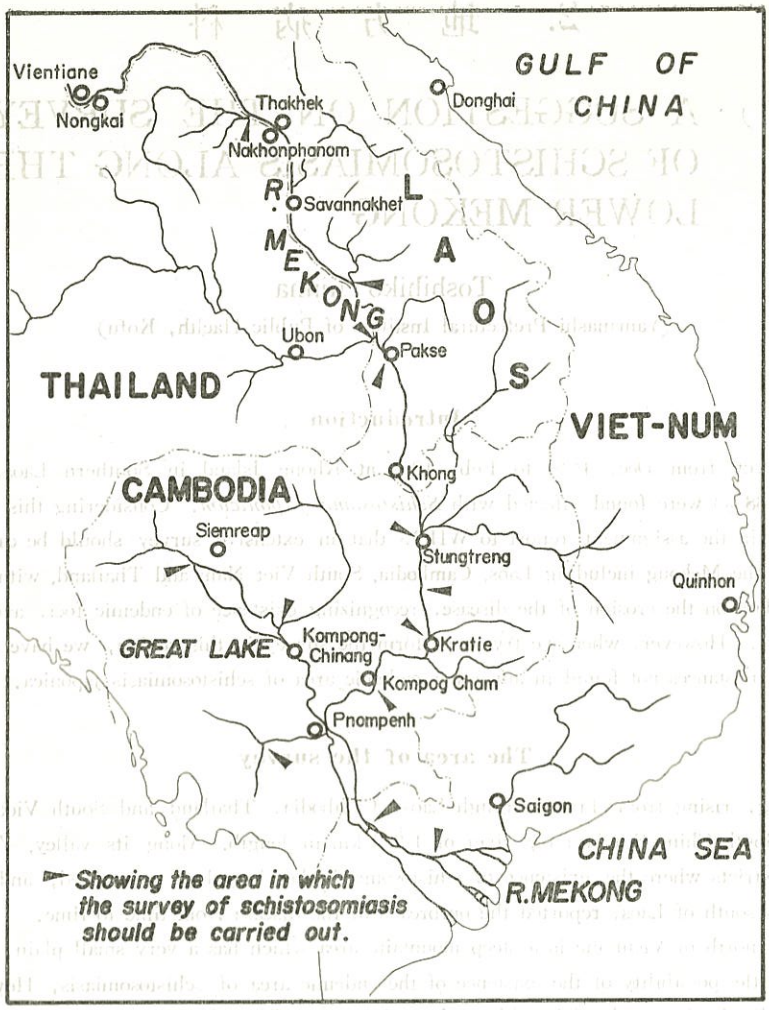
Considering these circumstances, the area south of Vientiane should be fixed as the place for investigation in future. In order to decide the examined spot, the following things should be considered.

1. At the junctions of the Mekong and its tributaries, the existence of the disease is quite possible.
2. The existence of snail coloney is quite possible in those areas which have rivers with many snail island in them.
3. In the regions where rivers flow slowly, the existence of the disease is quite possible.

The author believe that the shortest way to success in this survey is to investigate those regions bearing the above conditions extensively. And in order to accomplish the ECAFE schemes smoothly, the survey along the Mekong tributaries should also be carried, as these are the very areas in the schemes.

The term of the survey

To decide the term of the survey, we may have to consider the conditions from WHO, the connections with such organization as ECAFE, and the conditions of the country where we carry the survey.



But here the author try to decide the term only from a technical point of view. As the author mentioned above, if we choose the valley from Vientiane down to the mouth of the Mekong as the survey area, the distance will be more than 2,000 km long. It will take solid ten years for thisintensive survey to cover the whole region. However, it the main purpose is only to obtain the statistical data of the distribution of schistosomiasis, we should spend as less time as possible on this survey. Even in this case, it will take at least two weeks to carry out the survey of a single district, which means we will spend two or three years to cover the whole region. Here the author should not fail to say it does not include the time for the treatment of the patients who would be found in the survey area, and the time for the study or the research which we need for the controling measures.

The time of the survey

In the Lower Mekong, the rainy season ranges from May to October, and the dry season from November to March. The most suitable time for this survey cannot be easily decided. The rainy season will be the best time for snail searching, but in fact it is sometimes impossible to do this after a heavy rain or a flood. Needless to say, the dry season will be better for epidemiological survey. So we will have much more difficulties if we try these two (epidemiological survey and snail searching) at the same

time. We should take these conditions into a consideration in order to decide the best time for the survey

After all, we may have to spend both the rainy season and the dry season if the survey continues for a long time.

The party of the survey

The ideal teaming of a survey party will be as follows :

1.	Parasitologist	1.
2.	Malacologist	1.
3.	Technical assistant	2.

One for epidemiological survey, another for snail searching. As the work of technical assistant requires highly advanced techniques, it would be better for the party to take experts of each field from their own country

4.	Sanitary engineer	1.
5.	Interpreter	1-2.
6.	Nurse	

If possible

Materials

To supply materials needed for the survey is very difficult in the survey place. And it is also by no means easy to supply those from other place during the survey. It is desirable for the party to take equipments and materials needed for the survey. However, a full discussion between WHO and the experts should be made about the shares of responsibility for the supply and the transportation, and also about a means and expences for them. Table 1 shows materials needed for the survey.

Communication and adjustment with the Government and other organizations in the survey area

In our previous survey, the cooperations and assistances by Laos Government, ECAFE, WHO Resident representatives in both Bangkok and Vientiane and UN in Vientiane were perfect. And also the author should not forget to mention about the kind assistances geven to us by Bureau Research & Laboratory in Manila, Tropical Medicine & Hygiene in Bangkok, Thomas Dooley Foundation in Khong and USAID in Laos. Without these assistances, it is evident that the survey could not be carried out successfully. I may say that it was by luck that we could have some of these assistances. Though these helps were quite essential to our success, we can not always expect for the future surveys.

Good communication and adjustment about the following cases should be made beforehand.

1. *Transportation.*

In most cases of the surveys, transportation plays an important role. The wider the survey area becomes, the more becomes its inportance. Transportation facilities are expected to be prepared on the responsibility of the Government of the survey place.

Helicopter is one of the most effective means of transportation. According to the condition of the place, boats and cars also work well.

2. *Accommodation.*

Accommodation facilities in survey place are usually very poor. In most survey places we will find few hotels, therefore, we are sometimes forced to ply between the survey place and a big city with hotels. In such cases, less one or two hours will be expected for the trip between the two places. Somestimes we

may have to stay in private homes and arrangment for such should be made by the Goverment of the survey place.

3. *Food.*

Food is very often insanitary, and it is difficult to supply food materials. In our previous survey, Dr. Davia of The Thomas Dooley Foundation showed a great kindness about this problem. The problem of food should be considered well inadvance as we can not always expect such fortunate helps. It will be very convenient to us if the Government can find a good supplies of food for us.

4. *Laboratory.*

Only a few laboratories are with ample facilities in the survey place. We sometimes have to take the specimens to the laboratory which gives full facilities for our examination. Data of usable laboratory for our examination and negotiation of their use in advance will help us greatly.

In our last survey at Khong Island, remarkable assistances by Tropical Medicine & Hygiene in Bangkok and Bureau Research & Laboratory in Manila lead us smoothly to the success of our examinations.

Operation of the survey

1. *Matters for the survey.*

The following things should be emphasized in the survey.

(1). The investigation of incidence by intradermal test, stool examination for the native people.

Egg concentration methods like MIFC or MGL for stool examination are quite effective methods to detect egg carriers. As the author mentioned above, we should notice that only a few laboratories are good enough for such examinations.

(2). In the survey place there live the domestic animals, such as buffaloes, cows, dogs, cats, pigs and also wild mice with high population density are found. Among these buffaloes, cows and wild mice are important reservoir hosts, and we should take these as objectives of the examination.

2. *Preparation.*

Knowledge of the following things is very useful for the survey.

(1). Conditions of the survey place.

(2). Populations of the unit-city, town, village, school.

(3). Communication and adjustment with each organization.

(4). Transportation, accommodation and laboratories in the survey place.

(5). Assistances and cooperation which are attainable.

Making plans based on these data will be quite helpful for the operation of the survey.

3. *Execution of the survey.*

This refers to the intradermal test, stool examination and examination of reservoir hosts of which the author mentioned before.

In the intradermal test, we should be well aware that it will be difficult to deduce the incidence of schistosomiasis by screening of *Schistosoma japonicum* or by the positive ratio of intradermal test, as in this area we will find cross reaction by infection of *Schistosoma spindale* and *Clonorchis sinensis*.

Stool examination is to be experimented by egg concentration method, but in fact we may have to depend on direct smear method in the survey place. The former examination should be conducted in the laboratory appointed beforehand.

Miracidium hatching tests, no doubt, and effective method and rectal biopsy or liver biopsy is also effective, though we can not always and anywhere experiment these tests.

The examination of reservoir host helps not only to decide the endemic foci but to confirm the species name of *Schistosoma* in the area.

Besides stool examination, we would, if possible, do anatomical examination at the same time.

Watanabe's Concentration Method is effective if the stool examination is for buffaloes and cows.

(2). Snail searching.

In the dry season, it is sometimes very difficult to do snail searching, for not only small pools but even swampy land dry up in some places, while the rainy season when the snails are active is generally convenient except the time of flood which prevents us from our research.

All kinds of snails in the area should be collected and examined for the presence of cercariae of *Schistosoma japonicum*. We sometimes need to infect experimentally miracidium of *Schistosoma* obtained in the survey area both to *Oncomelanian* snails, and also to the suspected vector snails found in the survey area. In this way we will be able to decide species name of *Schistosoma* and its intermediate host.

The remaining problems

The preliminary survey will thus be finished at the Mekong Basin, I do not mean, however, that the whole problems are now solved about this disease in this area. The prevention and the treatment are the important problem which should never be left hehind.

I do not know how far WHO should take responsibility for these matters. Perhaps this does not belong to the appointed missions of WHO, but belongs to the tasks of research institutes in this field.

In case endemic foci of schistosomiasis is found at Mekong Basin and endemic area is wide and infection is widely spread, I feel the need to establish a Pilot Project as a countermeasure. The tasks of the Pilot project are as following.

1. Intensive survey of endemic foci, especially epidemiological survey.
2. Studied on the treatment and the prevention.
3. Biological studies on the intermediate host and control measure for it.

I hope that this project will be established and managed under the direct supervision of WHO, if the regulations of the organization permit.

Table : List of the equipments and materials necessary to carry out the survey of schistosomiasis japonica in the Mekong Basin.

I. Stationers

Camera	India rubber
Cellophane tape	Knife
Clothes (Uniform)	Letter paper
Clip	Note book
Colour ink (red, blue, black)	Paste
Detailed map (covered survey area)	Pencil
Envelope	Section paper
Film	Typewriter
Fountain pen	Typewriting paper
Hotchkiss (with needle)	

II. Materials to conduct the survey

1. For epidemiological survey

(1). For stool examination (Direct Smear Method, Egg Concentration Method,)

Absorbent cotton	Ether

Beaker
Cover glass
Cylinder (graduated)
MIFC and MGL information
Pipett
Pipett (measuring)
Reagents (to prepare the MIFC solution)
  Alcohol
  Distilled water
  Eosin
Glycelin
Reagents (to prepare the MGL solution)
  Distilled water
  Ether
  Formalin
Slide glass
Toothpick

(2). For intradermal test

Absorbent cotton
Adhesive plaster
Alcohol
Clinical thermometer
Distilled water
Guarze
Injection syringe
Measure
Needle
Schistosoma antigen

(3). For Miracidium Hatching Test

Absorbent cotton
Beaker
Cover glass
Erlenmeyer's flask (Hatching flask)
Guarze
Pipett
Slide glass

(4). For Watanabe's Egg Concentration Method

Absorbent cotton
Beaker
Cover glass
Guarze
Pipett
Slide glass

2. For snail searching

Absorbent cotton
Adhesive plaster
Collection bottle
Counter
Cover glass
Cresol
Distilled water
Filter paper
Robber boots
Robber gloves
Scissers
Slide glass
Gloves
Guarze
Hand glass
Handkerchief
Petri dish
pH meter
Pincett
Pipett
Surgeons knife
Tape measure
Thermometer
Towel