

COLLABORATION FOR THE CONTROL OF CYSTICERCOSIS/ ECHINOCOCCOSIS IN VIETNAM

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Abstract. A collaborative international project to control cysticercosis and cystic echinococcosis in Vietnam began in 2000. The project has drawn together the National Institute of Malariology, Parasitology and Entomology (NIMPE), Vietnam, and the WHO (Hanoi). Other contributors are the Prince Leopold Institute of Tropical Medicine (PLITM) in Belgium, the University of Salford, England, and the Asahikawa Medical College (AMC). Based on my experience of similar collaborations on cysticercosis in Indonesia, I offer a brief explanation of what my group at AMC has been doing and what we can do. The most important proposals are: 1) how to transfer up-to-date technology for differential sero- and molecular diagnosis that will be of use in an epidemiological survey of cysticercosis and echinococcosis as well in the identification of patients; 2) how to collaborate with the NIMPE for the control of these diseases; 3) how to encourage the young generation of researchers in the NIMPE to participate in the project.

INTRODUCTION

Taeniasis, which is caused by either *Taenia solium*, *T. saginata* or *T. saginata asiatica* (*T. asiatica*), is a food- or pork-borne intestinal parasitic infection of humans. However, cysticercosis in domestic animals or humans is a soil-transmitted helminthiasis (STH). Neurocysticercosis (NCC) is caused by the larval stage of *Taenia solium*; echinococcosis is caused by the larval stages of *Echinococcus granulosus* (cystic echinococcosis, CE); and *E. multilocularis* (alveolar echinococcosis, AE); these two diseases are the most serious zoonotic cestodiasis that threaten human life worldwide and they represent a significant hazard in most developing countries. In many countries, the important social and environmental factors associated with the transmission of cysticercosis and echinococcosis include inadequately developed public health, medical and veterinary services, climatic and environmental conditions that support the maintenance of zoonotic life cycles, poor standards of hygiene and education. In most of the Asian countries where pork is consumed, NCC can be found; due to a lack of public health awareness and a lack of reliable control measures, the disease is often underestimated. In Thailand, NCC is not so generally prevalent but is likely to be common in northern areas. In all the neighboring countries (Cambodia, Vietnam, Lao PDR, China, Myanmar), it is endemic (Singh *et al.*, 2002). The Asahikawa Medical College (AMC) group has been conducting or involved in, several collaborative international projects to control cysticercosis and

echinococcosis in Asia, Africa, Europe and America: NCC in Asia (China, Indonesia, Papua New Guinea, Thailand, India, Nepal, Vietnam), Africa (South Africa, Mozambique, Tanzania, Cameroon), Europe (Portugal, Netherlands, Denmark, UK) and Mexico and Latin America (Ecuador, Brazil); CE in Asia, Jordan, Poland and Australia; AE in Asia, USA and Europe.

WHAT WE AT AMC HAVE BEEN DOING IN INDONESIA

I have already summarized the Asian NCC initiatives that the AMC group is working on (Ito *et al.*, 2002a). In this ACIPAC session, recent advances in the epidemiological study of NCC in Irian Jaya (West Papua), Indonesia are briefly summarized by way of an introduction to the project in Vietnam. The epidemiological survey in Irian Jaya has given us some strategies for epidemiological work for the detection of taeniasis carriers and NCC cases. Based on these original findings, I would like to discuss what we have to do in order to control NCC and CE in Vietnam.

WHAT IS GOING ON IN IRIAN JAYA, INDONESIA

In 1996, we started a collaborative project in order to conduct an epidemiological survey of taeniasis/cysticercosis in Indonesia, mainly in West Papua (Irian Jaya) (Ito, 1997; Simanjuntak *et al.*, 1997). My group at AMC had developed differential serodiagnosis for NCC, CE and AE (Ito *et al.*, 1993, 1998, 1999a, 2000) and for cysticercosis in pigs (Ito *et al.*, 1999b), we applied serology for the detection of NCC patients and pigs infected with *T. solium* in Jayawijaya District (eastern part), Irian Jaya. A sero-epidemiological survey revealed NCC in Irian Jaya (Wandra *et al.*, 2000,

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submitted) and cysticercosis in pigs (Subahar *et al*, 2001). We succeeded in obtaining *T. solium* segments from the three copro-antigen positive people who were among 38 people who submitted fecal samples (3/38) in Wamena (Subahar *et al*, unpublished data). The expelled segments were confirmed as *T. solium* by mitochondrial DNA sequencing (Okamoto *et al*, unpublished data). NCC cases have been reported from the west of Paniai District since the early 1970s (Tumada and Margono, 1973); we believe that NCC has been spreading from west to east. We were asked to check approximately 600 human sera from Papua New Guinea (PNG) in 1997 because it was feared that NCC had been introduced to PNG from West Papua by refugees and immigrants (McManus, 1995). One serologically suspected refugee was found in a refugee camp in PNG (Fritzsche *et al*, 1990). We found one woman with very strong specific antibody responses, as in typical NCC, and some rather weakly positive responses among the local residents rather than the refugees (Wandra *et al*, 2001 submitted).

We are now interested in comparing the epidemics in Paniai and Jauawijaya in West Papua while simultaneously conducting a sero-epidemiological survey in PNG if we are asked to do so. Subahar has a scholarship from the Japan Society of Promotion of Science (JSPS) to be a part-time PhD student from 2000. He can do laboratory work at AMC for three months every year for five years in order to prepare his thesis. Wandra is also trying to get a scholarship from the JSPS and is waiting for the final official recommendation for 2001. At the moment, we have no other funding for further field surveys in 2001 other than the scholarship and we are therefore seeking research funds. I hope to be able to get a new research fund from the JSPS for carrying out international collaboration projects in Asia from 2002.

WHAT WE CAN AND SHOULD DO FOR THE CONTROL OF NCC IN VIETNAM

A collaborative project for the control of NCC in Vietnam began in 2000. The project draws together the NIMPE in Hanoi, the WHO in Hanoi, the PLITM in Antwerp, and the AMC. When I organized an international workshop entitled 'Toward multilateral collaboration and cooperation for the control of echinococcosis, cysticercosis and other zoonotic parasitic infections in the western part of China' in Chengdu, China in 2000 (Ito, 2001), experts from the USA (Schantz), the UK (Craig), France (Vuitton), New Zealand (Heath), Denmark (Lee) and Japan (Ito) attended as did Urbani from the WHO. Based on a continuing discussion that spanned several meetings:

Chengdu (2000) (Ito *et al*, 2002b); Poznan (2000) (Craig and Pawlowski, 2002), Bangkok (2000) (Ito and Urbani, 2002), we launched a collaborative project for the control of cysticercosis/cystic echinococcosis in Vietnam. In order to identify *T. solium* worm carriers, the system of detection of copro-antigens of taeniasis and echinococcosis that was developed by Craig and his colleagues will be used. A sero-epidemiological survey has already started between NIMPE and PLITM and a comparative analysis of data produced by the different methods (one for the detection of circulating antigens at PLITM, the other for the detection of antibodies at AMC) is now being critically evaluated. A transfer of technology for the detection by serodiagnosis of NCC and the detection of the worm carriers is under consideration. I recommend that young researchers apply for a scholarship from the JSPS: such scholarships were available only to those in Bangladesh, China, India, Indonesia, Korea, Malaysia, Philippines, and Thailand last year, but from this year, they are available for those in Vietnam too. At the moment, Craig and I are thinking about visiting Hanoi for the exchange of mutual information and the transfer of technology. Although I have had research funding from either the Ministry of Education or the JSPS these past eight years, I have failed to secure funding this year - possibly due to my own careless error. I have still to secure the travel funding in order to invite researchers from Vietnam and defray the cost of my visit to Vietnam later this year.

As my group at AMC has been involved in the project on the transmission ecology of alveolar echinococcosis in China sponsored by the National Institute of Health (NIH) of the USA, I have to participate in this project on the Tibetan plateau, where both AE and CE are endemic. The principal investigator is Craig (UK). The core investigators are Qiu Jiamin (China), Schantz (USA), Danson (UK), Torgeson (Ireland), Giraudoux and Vuitton (France) and Ito (Japan). Based on my experience in international collaboration, as well as with the Indonesia project that I have mentioned, I expect that we could develop a similar project for the control of cysticercosis and echinococcosis in Vietnam.

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