

RESEARCH COMMUNICATION

Liver Fluke Prevention and Control in the Northeast of Thailand Through Action Research

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Abstract

The aim of this action research was to enhance people's potential to prevent and control liver fluke infestation. The subjects were a total of 96 participants comprising 20 community leaders, 74 individuals handling and preparing food, and 2 officials from the Local Administration. Quantitative data were collected through questionnaire and the results of stool examination of the participants were recorded. The main methods used to collect qualitative data were focus group discussions and in-depth interviews. For qualitative data analysis, the researchers undertook a qualitative content analysis. For quantitative data, conventional descriptive statistics were used and the mean differences with the 95% CI before and after the study were compared. The results in the early stage found that the participants were not aware of the fact that eating raw fish might be the cause of developing cholangiocarcinoma. 94.8% of participants however knew that eating raw fish might be cause having liver fluke infection which can be treated by taking an antihelminthic drug. They perceived that it is way of life since their ancestors already consumed raw fish because they found it to be delicious. However, through participating in this study, it was realized how dangerous it is to get infected with the liver fluke. Participants also learned the life cycle of liver fluke. They talked about this within their families, and communicated as well as cooperated with others to strengthen a network of a club concentrating on not eating raw fish. The communities and the Sub-district Administrative Organization supported the project. In conclusion, it is advisable to improve the behavior of participants in villages so that they became aware how to prevent and control liver fluke infection and therefore the development of cholangiocarcinoma.

Keywords: Liver fluke - prevention and control - action research - Northeast Thailand

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Introduction

Opisthorchis viverrini infection leading to cholangiocarcinoma is a serious public health problem in the Northeast of Thailand. Cholangiocarcinoma is responsible for 15% of liver cancers in the US but represents 86.5% of all cancers in Thailand, especially in the Khon Kaen region, with the highest incidence in the world (Parkin M et al., 1993). From the mortality statistics of Thailand in 2004, it was found that the cause of death from liver cancer and cholangiocarcinoma ranked fourth after HIV/AIDS, stroke and traffic accidents. Per year 28,000 people die from liver cancer and cholangiocarcinoma that are 76 people per day. At present, the trend of death by cholangiocarcinoma has not decreased (National Cancer Institute, 2008).

From a survey of the prevalence of parasite infestations all over Thailand in 2007, it is known that the prevalence of liver flukes in the northeastern region was higher than in the other regions of the country. That was 18.6% in the northeast, whereas in the southern, central and northern

regions and throughout the whole country the rates were 0.1%, 1.3%, 10.0% and 8.7% respectively. It was also found that northeastern people still like very much to eat raw fish 75% (Office of Disease Prevention and Control 6, Khon Kaen, 2009). It is known from animal experiments, that eating food high with Nitrosamine together with liver fluke infestation increase the risk to develop cholangiocarcinoma (Mairiang et al., 1993; Honjo et al., 2005). A similar mechanism also must be assumed for humans. Cholangiocarcinoma is a cancer with a very bad prognosis. Patients frequently show up at the hospitals at the end stage of the disease and will die soon. Chemotherapy or radiation as palliative treatment has only limited effect on the course of the disease. Presently the most appropriate treatment is surgery however with a rather bad prognostic outcome and with a high fatality rate.

The liver fluke infestation of northeastern people and raw fish consumption continues despite attempts of the Ministry of Public Health to curb this habit. There were campaigns to stop eating raw fish and giving

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praziquantel for several years. But the occurrence of cholangiocarcinoma showed no signs of decreasing. Every year, a lot of people die from this disease, and cannot find any way to solve the problem effectively (Chokewanichpong et al., 2009). Therefore newer methods to influence the behavior of people should be tried and implemented. This study responds to this request.

Materials and Methods

This study had been conducted as an action research at a village of the Ban Phai district, Khon Kaen, Thailand. The participants were volunteers derived from four groups of people. They had been informed about the purpose of the research, procedure and usefulness of the study and were also given a chance to question the researchers. The total of 96 participants comprised 20 community leaders, 74 individuals handling and preparing food, and 2 officials from the Local Administration.

Data collection

The study used both quantitative and qualitative methods for collecting information. Knowledge and behavior in preventing liver flukes by using a 15 items semi-structured interview with those preparing meals for families and the results of stool exam of the target group by using Kato's thick smear technique (Kato and Miura, 1954) were collected.

Qualitative data: Information was obtained by four focus group discussions and 15 in-depth interviews. Point of views from community leaders, those preparing meals, and people doing stool examinations for eggs of liver flukes participated in four focus group discussions and had the chance to express their feelings, experiences, and ability to prevent and control liver fluke infections. The facilitators encouraged them to express their opinions and identify strategies for problem solving. For each round of discussion 10 persons took part with similar experiences about liver fluke infection.

Data analysis: Socio-economic information, knowledge about liver fluke infection, people's behavior towards prevention and control of liver flukes, and results of the stool exam were analyzed by counting frequencies, percentage, mean and standard deviation. Results obtained as baseline and after intervention had been compared by using the mean difference and 95% CI.

Qualitative data analysis: For qualitative data analysis the content analysis was done (Elo, S. Kyngas, H., 2008). The investigators transcribed the information from focus group discussions and reviewed all data together. The data were coded into a number of categories, and the categories linked together. Sub-categories with similar content were combined to generic categories, and the generic categories were then combined into main categories to describe the situation.

Trustworthiness: The study was examined using the guideline of Guba and Lincoln's (Guba, Lincoln, 1981). To ensure accuracy of data, different methods were used to collect data. Moreover, the investigators returned the data and interpretation to the participants of the focus group discussions

Results

Base line data

The majority of the participants are females and 15 to 50 years old. Most of them had a primary school education and were housewives. From the participants 23.3% admitted that they eat raw fish. Focus group discussions gave an even better insight into the nature of the problems.

Knowledge about Liver Flukes

Before the study, almost 50% of the participants did not know much about liver flukes, (44.8%, 43 people); 38 individuals (39.9%) had some idea about the danger of the liver fluke infection. After the intervention 49 people (54%) improved their knowledge about the parasite. All together 7.1% of the participants comprehended the issue than better than before. The significant difference was at 0.001 level.

For improving the know-how about liver fluke training sessions used video tape and model of cholangiocarcinoma patient in the village. The researcher talked about cholangiocarcinoma patient in village. As participants in village knew that eating raw fish is the cause of cholangiocarcinoma, what the bad results of having this disease. Who are sick and die from these, and then they will concern about disease. Moreover, housewives preparing the meals for the family could answer a number of questions correctly and they voiced the impression that they know everything about liver fluke infection. Most villagers knew that eating raw fish might result in an infection and they know that frying and cooking the fish properly will kill the parasite. One of the housewives said: "Before I understand that eating everything raw will cause liver flukes such as salty and sour sliced meat (Koy). I like it very much because it is very delicious. But when I attended the training I knew that liver flukes will come from eating raw fish such as salty and sour fish (Koy) fermented fish (pla-ra), sour fish (som pla), etc. The easy way of prevention is to stop eating these dishes." Other housewives also agreed with this. Another female said, "Before I did not know that fish had liver flukes. I had been eating for several decades, nothing happened to me. But after joining this training, I knew more". These statements show that the know-how of people improved.

Behavior towards liver fluke prevention

There was a significant statistical difference between the average of behavior scores towards liver fluke prevention before and after the study (4.54, 4.09-4.99; <0.001).

Majority of the housewives cooked with raw fermented fish. Their reasons were that "it is way of life since their ancestors", and it is more delicious and was easy to purchase. Sour fish (pla som dib) or raw salty and sour fish (Koy pla dib) were consumed at parties or family reunions which they had once in a while. People think that the meals are delicious, crisp and sweet and they are used to this food since childhood. An important fact was that after eating risky food they could take antihelminthic drug bought from the pharmacy right away. Besides some villagers believe that fermented salty fish (pla jom) they

can eat until it becomes sour fish (pla som). However, after campaigning not to eat raw fish by various means such as cooking competitions, creating slogans, singing local old songs and introducing the so-called model citizen's award, the habit of eating raw fish decreased. A group in the village cooked fermented fish for sale and the product was very popular among villagers. One villager said that "now when I crave raw salty and sour fish I have to eat secretly because I'm afraid that my children and wife will see. The rest of the family does not eat it any more. I look like I am a ghost (Phii Paup). Have to hide I feel shame but try to eat less gradually." The others agreed with this statement. Moreover "Before when we have feast we love to make a dish of raw fish (Koy) to eat with white liquor, more delicious. It is a way of life since mine ancestors. But now, I try to eat less because my father was dead by cancer."

Finding Liver Flukes

The proportion of liver flukes infection before and after the study was 11.7% and 2.05% respectively. The difference was statistically significant at 0.001. The success of the study was partly due to the "Club of non-eating raw fish" which was established by 60 participants. They invited additional participants to exchange their ideas regularly. The volunteer group would visit families known to still eat raw fish periodically. Besides that they have made a format to take note of one's behavior for the risky group as a diary to take note. The risky group had less infestation. As one saying of a villager, "Before I think that I am afraid of starving more than dying because it is delicious, especially when I could find a fresh fish and cook it as "Koy", the taste of fish is fresh and sweet. At that time I am not afraid of death. But right now when I eat raw fish I have upset stomach and discomfort. I will buy antihelminthic drug from the pharmacy. When I feel better I'll eat it again. I keep on doing like this. Now, I know that it is not good to conduct our life like this. We might have liver cancer, I start to get scared." Other than that, "In our family, everybody eats "Koy". Kids eat because mother makes it. I myself like it as well. After two months of eating "Koy" we will take medicine. We continue behaving like this for ages. Then last year, Grandfather died of liver cancer. After participating in the study I do not want to die of liver cancer. I have to decrease consuming raw fish for certain". This agrees to the result of stool exam that the proportion of parasites were decreased.

Discussion

From evidence of epidemiology and animal tests it was found that the main cause of having cholangiocarcinoma is liver fluke infestation (Ohshima et al., 1994), and another important cause is behavior of eating raw fish, which is a popular food consumed in the northeast, Thailand. That resulted in the highest occurrence of having Cholangiocarcinoma in the country and in the world in 1988-1989 (Yeoh et al., 2009). This study found that people ate raw fish regularly 21.9%, mostly from eating raw fermented fish, or some families ate raw sour fish (pla

dib) or raw salty fish (pla jom) regularly. The fish that were used to make raw sour fish were types of white fish. These fish have young worms in the period of parasite infestation of liver cancer. This evidence agreed with other studies (Chokewanichpong et al., 2009).

Participants of study gained more knowledge about liver flukes compared with before and after operation due to having knowledge from the lecture, video, experience, discussions, and exhibitions. In addition, most participants in village knew that taking antihelminth drug (Praziquantel) several times could cause liver cancer. It helped participants to have more appropriate behavior. Therefore giving participants the right knowledge is the most important thing to be able to change a long time of raw fish consumption behavior. If people understand liver fluke's life cycle, this will make them know the cause of entering in humans' body and understand the pathology that will happen when liver flukes enter the bile duct cells, then cholangiocarcinoma follows.

The proportion of liver fluke infection is decreased and there has been no re-infection in this village. This was because the volunteers followed up the risk families including everything their consumption regularly. The visiting would motivate them to have suitable eating behavior. Daily record is a way to control their behavior. From evidence of immunity studies, the patients who have liver flukes infection have very low immune, so the chance to be infected is rather high (Wongratanacheewin et al., 2003). The researcher's participatory observation found that participants are more interested in liver flukes and they are quite alert on this matter by having stool exams. Therefore the visiting and follow-up of risky families is another way of decreasing liver flukes.

The results in the early stage found that the participants was lacking knowledge about eating raw fish is the cause of having cholangiocarcinoma. 94.8% of participants knew that eating raw fish is the cause of having liver fluke which can be cured by taking anthelmintic. Therefore the participants must get to realize that eating raw fish is the cause of having cholangiocarcinoma, what the bad results of having this disease might be and that taking anthelmintic is not a good prevention. However, through participating in this study, they gained vital knowledge in the liver fluke. They also learn life cycle of liver fluke, how to stop eating raw fish, cause of having cholangiocarcinoma and provide knowledge to their family. Moreover, they demonstrated a greater sense of consciousness raising and were able to improve the behavior of preventing liver fluke in their family. They learned to communicate and cooperate with others to strengthen the network of the Club of non-eating raw fish also, and provide information to others. Community support was received community to participation for along time and Tambon Administrators leads liver fluke problem to reach budget regulation. The community has come in to participate in prevention and control of liver fluke and no re-infection were found in the village. It is advisable to improve the behaviors of participants in village to become an important mechanism for sustainable prevention and controlling liver fluke in the community. It is recommended that this research should be beneficial towards applying this pattern in

preventing and controlling liver fluke infestations and cholangiocarcinoma.

The limit of this study is the duration of time because the researchers spent only 1 year. In fact that changing behavior should take more time. However, the team built core leaders in the community and public health officials in the area to continue the activities.

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