

## Assessment of Knowledge, Attitudes and Practice on Prevention of Sparganosis Infection among Inhabitants of Babati District, Tanzania

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### Abstract

The knowledge, attitudes, and practice among inhabitants of Babati district in Tanzania on sparganosis were evaluated. A cross-sectional study was carried out among 160 participants from the district. Demographic and socioeconomic information of the participants and their KAP on sparganosis was collected by using a pre-tested questionnaire. All 160(100%) participants had no knowledge about sparganosis. Regarding attitude of participants to keeping dogs and cats; all 160 (100%) participants were not aware of dangers associated with dogs and cats to transmission of sparganosis. 39 (30.0%) of the participants had knowledge of drinking boiled water. There is a need to organise health education programme about sparganosis to increase community knowledge.

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## Introduction

Human sparganosis is caused by tissue invading plerocercoid larva of *Spirometra*. It is manifested usually by migrating granulomatous lesions [1]. The disease has been reported worldwide [2]. Its first intermediate host is the copepod, the second intermediate hosts include a wide spectrum of vertebrates such as amphibians, reptiles, birds and mammals [3, 4, 5]. Humans are also second intermediate hosts and can be infected through drinking water containing infected *Cyclops* or eating the second intermediate hosts infected with spargana. Spargana can migrate widely in the human visceral organs and the resulting symptoms are different depending on the particular tissues or organs involved [6]. Recently, sparganosis of the central nervous system attracted much attentions world wide because of its scattered discoveries [7, 8, 9]. The major symptoms of neurosparganosis are hemiparesis, seizures, headache and deterioration of intelligence in young adults [9]. Therefore, more attention should be paid on the clinical implication of human sparganosis. Studies on human sparganosis in Babati district, Tanzania has not been reported. This study aimed to evaluate the knowledge, attitude, and practices (KAP) on sparganosis among participants in Babati district in Tanzania.

## Materials and Methods

In the present study the following methodological approach was used.

### *Ethical Consideration*

The protocol of this study was approved by the National Institute for Medical Research (Reference No. NIMR/HQ/R.8a/Vol.IX/1285). During field work the objectives of the study were explained to the participants. They were informed that their participation was totally voluntary and that they could decide not to participate in the study. Written and signed or thumb-printed informed consents were obtained from all participants before starting the survey.

### *Study area*

A cross-sectional study was carried out in Babati district, Tanzania. This study was conducted in three wards namely Galapo, Mamire and Magugu. It was a health facility based study. Participants who came from selected health facilities were involved in the study. A total of 160 participants were involved in the study.

### *Questionnaire Survey*

This survey utilised a validated structured questionnaire to collect information on the KAP of the participants towards sparganosis as well as their demographic and socioeconomic status. Questions on knowledge were open-ended questions, without multiple choice answers to avoid guessing which might give a false impression of the knowledge of the participant. On the other hand, the questions on the practices were provided with multiple choice answers to assess the frequency of doing these activities or actions. Similarly, questions on the attitude were also with multiple choice answers to evaluate the prevailing attitudes that the participants might have about sparganosis infection.

### **Data Analysis**

Data entry was done into Microsoft Office Excel 2007 spread sheets. Data analysis was performed by using EpiInfo version 3.

### **Results**

#### *Demographic Characteristics of Respondents*

A total of 160 participants from the three wards of Babati district were included in the study. Of these, 19.4% were from Galapo ward, 29.4% from Mamire ward and 51.3% were from Magugu ward. Examination of socio-demographic characteristics did not disclose significant differences between the participants in the district. Sex of participants, 93(58.1%) were males and 67 (41.9%) were females. Age of participants, 26 (16.25%) were between 18-28 years, 33 (20.6%) were aged between 30-39 years, 43 (26.9%) were 40-49 years, 31(19.4%) were 50-59 years, 20 (12.5%) were aged between 60-69 years, 4 (2.5%) were aged between 70-79 years old and 3 (1.9%) were older than 80 years. Marital status: married were 115 (71.9%), unmarried 32 (20.0%), widow 7 (4.4%) and separated 6 (3.8%). Of all 160 participants, 36 (22.5%) had not attended school, 1 (0.6%) adult education, 26 (16.3%) Primary Education (I-IV), 81 (50.6%) Primary Education (V-VII), 10 (6.3%) Secondary Education (Form 1-4), 3 (1.9%) Secondary Education (Form5-6) and 3 (1.9%) Higher Education (University/College) as in (Table 1).

The disease sparganosis was described to the participants then were asked whether they ever heard the disease sparganosis, all 160 (100%) respondents denied to have heard sparganosis. Additionally, 160

Table 1: Demographic Characteristics of respondents

S/No	Study variable	No. of participants	Percentage (%)
<b>1</b>	<b>Age</b>		
	18-29	26	16.25
	30-39	33	20.6
	40-49	43	26.9
	50-59	31	19.4
	60-69	20	12.5
	70-79	4	2.5
	80 years and above	3	1.9
	<b>Total</b>	<b>160</b>	<b>100.0</b>
<b>2</b>	<b>Gender</b>		
	Female	67	41.9
	Male	93	58.1
	<b>Total</b>	<b>160</b>	<b>100.0</b>
<b>3</b>	<b>Marital status</b>		
	Married	115	71.9
	Unmarried	32	20.0
	Widow	7	4.4
	Separated	6	3.8
	<b>Total</b>	<b>160</b>	<b>100.0</b>
<b>4</b>	<b>Level of education</b>		
	Not attended	36	22.5
	Adult education	1	0.6
	Primary educ.(I-IV)	26	16.3
	Primary edu.(V-VII)	81	50.6
	Sec. educ.(FI-IV)	10	6.3
	Sec.educ (FV-VI)	3	1.9
	Un/College	3	1.9
	<b>Total</b>	<b>160</b>	<b>100.0</b>

Table 2: Distribution of participants in relation to the habit of boiling water for drinking

Boil water for drinking/ [1=All the time, 2=Not always, 3=No]	No.of respondents	Percent
<b>1</b>	39	24.4%
<b>2</b>	26	16.3%
<b>3</b>	95	59.4%
<b>Total</b>	160	100.0%

(100%) participants reported that no relative had ever been sick or died of sparganosis.

The activities carried out to earn income (economic activities) by the participants were determined. Majority of the participants were involved in farm production (91.9%) followed by animal keeping (25.6%). Few of them were employees (3.1%) and a small number were involved in business (0.6%).

#### *Association of Participants with Attitude of keeping Dogs and Cats*

Participants were asked if they were keeping dogs and cats, 93(58.1%) participants responded to have been keeping dogs and cats; the other 67(41.9%) participants responded not to been keeping. Participants were asked the aim of keeping the pets. The 93 (58.1%) of the participants answered that it was for protection purpose

#### *Association of Participants with Practice of keeping Dogs and Cats*

The practice of keeping dogs and cats was tested among the participants. The result was, 62 (38.8%) of the participants responded that the pets were kept in a semi free-range system.

#### *Boiling of Water which Participants Drink*

Sparganosis can be transmitted through drinking unsafe water. Participants were asked about boiling water for drinking. 39 (24.4%) of the participants said they always boil water for drinking. 26 (16.3%) said they do not always boil water for drinking and 95 (59.4%) indicated that they never boil water for drinking (Table 2).

#### *Association of Participants with risk of Water Supply Sources*

Participants were asked about the sources of water they use. 14 (8.7%) of the participants responded that they get water mainly from shallow wells; 5 (3.1%) of the participants said they get water from deep wells; 83 (51.9) get water from rivers and 58 (36.3%) of the participant get water from running springs (Table 3) while 144 (90.0%) of the participants responded that the water sources are within the villages.

#### *Association of Participants with Risk of Eating and Methods of Preparing Game Meat for Consumption*

Sparganosis can be transmitted through eating game meat which is infected with spargana. Spargana

can be transmitted to human if the meat is partially cooked. The participants were asked about eating game meat. 61 (38.1%) responded to be eating game meat; 58 (36.3%) of the participants responded that the meat is not inspected by the Government meat inspectors; and 48 (30.0%) of participants responded that they prepare meat by boiling.

### **Discussion**

#### *Knowledge*

With respect to knowledge of the mode of transmission of sparganosis, previous investigations have demonstrated that dogs and cats are definitive hosts in the life cycle of *Spirometra* sp. [10, 11, 4, 12, 13]. The adult worm develops in their small intestines and start discharging eggs in their faeces. The faeces are washed with water to sources of water where eggs hatch to coracidia. The Cyclops (first intermediate host) ingest coracidia where they develop to proceroid. Human is an accidental second intermediate host, can get infection through drinking unboiled or untreated water containing cyclops infected with proceroids. In the present study the disease sparganosis was described including clinical signs and symptoms, 160 (100%) of the respondents denied to have heard of sparganosis. The result confirms that there is lack of knowledge on this disease, mode of transmission, signs and symptoms and prevention. There have been no cases of sparganosis reported in the study group. No study has been carried out in this disease in the study area. Therefore, the disease is not known to the community.

#### *Attitude*

The attitude towards keeping dogs and cats was examined in this study. Dogs easily get infection with *Spirometra* because they are not confined. They get prey from small animals and carcasses within the area which some of them may be infected with spargana. The pets defecate without proper faecal disposal resulting in contamination of the environment and they are not dewormed. The best way of keeping pets is in a confined manner restricted in one place, fed well, dewormed regularly and vaccinated with antirabbies and against other diseases and proper disposal of their faeces. In the present study, the respondents lacked the appropriate awareness of the dangers associated with the dogs on transmission of sparganosis.

#### *Practices*

Table 3: Types of water supply sources

Type of water sources	No. of participants	Percent (%)
Local Shallow wells	14	8.7
Deep Wells	4	3.1
River	83	51.9
Running springs	58	36.3
<b>Total</b>	<b>160</b>	<b>100</b>

Dogs and cats can be kept as pets, keeping them in a confined area, fed well and proper disposal of faeces. In the present study, the result shows that the practice of keeping dogs and cats among the respondents is in the form of semi-confined. The aim of keeping dogs and cats by the respondents is for protection.

#### *Risk Factors*

The association of level of education and the risk factor of drinking unsafe water was examined. Most of the respondents had attained education level of Standard VII. According to the policy of the country standard seven is universal education which every Tanzanian should reach so as to be able to read and write.

The water supply to the villages of the respondents is by pipes which are connected from the water sources then distributed direct to the villages. There is no stage where water is treated; this could be due to financial constraints of the Government thus failing to buy chemicals for treating water for domestic use of the inhabitants. Villagers are aware of this, that water supplied to them is not treated at any stage still no emphasis has been put on improving access to clean water, adequate sanitation and changing hygiene behaviour, although these interventions are key factors for sustainable control. The water is not safe at all because it has not been treated and is used for drinking without boiling. The water sources are not protected; can easily be contaminated with faeces of wild animals which are definitive hosts of *Spirometra* and the *Cyclops* which are found in natural water bodies can be infected with *coracidia*. As a result users of this water can easily get infection through unsafe water.

Participants in this study were from areas surrounding Tarangire National Park. Both illegal and legal hunters sell game meat, the meat sold is not inspected by any authorised meat inspector. Therefore, people in these areas are predisposed to high risk of diseases which can be transmitted through meat like sparganosis and Brucellosis. In the present study, it was found that the preferred methods of preparation of meat include boiling, followed by roasting and eating raw meat. The result shows that people in this area of study are at risk of getting sparganosis from partially boiled or roasted meat infected with spargana. Previous studies on parasitic worm infections support that both individual and community perceptions, attitudes, prevention and treatment are important factors [14,15,16]. Therefore, health education and promotion campaigns are essential for any change in behaviour to be made.

#### **Conclusion and Recommendations**

It was observed that the knowledge of participants in this study was very poor; all participants had no knowledge about the disease. 30% of participants had knowledge of drinking boiled water as a measure of preventing transmission of sparganosis. None of the participants was aware of the attitude of participants regarding keeping dogs and cats which is associated with transmission of sparganosis.

It is recommended that the Government through the Ministry of Health and Social Welfare should design awareness campaigns for the benefit of the community so as to help them develop proper understanding of sparganosis, preventive measures against transmission of sparganosis and dangers

associated with keeping dogs and cats in terms of transmission of sparganosis.

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