

Zoonoses and Food Hygiene News

Vol. 15 No. 4 October to December 2009

Government of Nepal, Registration Number: 148/049/050

This Issue has been Supported by VLIR Project, Belgium and UESHP-III, IDRC, Canada

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Zoonoses and Food Hygiene News, published four times a year, provides a medium for disseminating technical information on matters related to zoonoses and food hygiene generated in the world, particularly in Nepal. The editors welcome submissions on these topics with appropriate illustrations and references. The views and opinions expressed in the News are those of the authors.

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Prevalence of Cystic Echinococcosis/Hydatidosis in Slaughtered Buffaloes of Kathmandu Metropolitan City

Bidur Prasad Gautam and Durga Datt Joshi

ABSTRACT

This study was conducted during March to July 2009 as an attempt to determine the prevalence of cystic Echinococcosis/ Hydatidosis in buffaloes slaughtered in Kathmandu Metropolitan City and to assess its impact on public health. Among positive cases, 58.33% had infection in lungs, 20.83% had infection in liver and 20.83% had infection in both lungs and liver. The largest cyst collected was 16 cm in diameter and contained 1100 ml of fluid while the smallest one was 1 cm in diameter and contained 0.5 ml of fluid. 24.44% of the cysts were fertile and 75.55% of them were sterile. Thus it can be concluded that the people of Kathmandu Metropolitan City are at a risk of being infected from hydatidosis and so there is an utmost need to implement the control measures of the disease.

Keywords: Cystic Echinococcosis, buffaloes, necropsy, human, questionnaire

INTRODUCTION

Cystic Echinococcosis/Hydatidosis is a cyclo-anthropozoonotic disease (Parasitic infestation) of herbivorous animals and human caused by larval stage of *Echinococcus* tapeworm, belonging to the family Taeniidae. Dogs and some wild carnivores like foxes are definitive hosts harbouring worms in their intestine while herbivorous animals and man are intermediate host. Human acts as the dead-end host of the parasite (Soulsby, 2005).

OBJECTIVES:

- To study the epidemiology of hydatidosis in buffaloes slaughtered in Kathmandu Metropolitan City and to assess its impact on public health.
- To document the range of size and quantity of fluid in hydatid cyst, proportion of fertile and infertile cysts and the major organs of infection in buffaloes.
- To define the role of abattoir workers and meat sellers as a contributing factor for the incidence of Echinococcosis.

Epidemiology of Echinococcosis in Nepal:

The researches on epidemiologic surveillance of Cystic Echinococcosis in slaughtering animals were done in 1972. In that study, 13% of buffaloes slaughtered for meat were found positive for hydatid cyst (Joshi, 1973). Joshi (1991) reported hydatid cysts in 5% (153/3065) of water buffaloes, 3% (55/1783) of goat, 8% (12/150) of sheep and 7% (10/143) of the pig carcasses that were examined in 77 small abattoirs in Kathmandu between May and September 1991.

Altogether 18,805 slaughtered animals in different areas of Kathmandu were examined for hydatid cysts during 1993 to 1995. Of the total examined, 18% buffalo, 9% sheep, 4% goat and 9% pig were found positive for hydatid cysts. Liver and lungs were found equally affected and in some of the animals, both liver and lungs were found positive for hydatid cysts (Joshi et al., 1996).

Maharjan (1996) reported 21% hydatid cases in 535 slaughtered water buffaloes in the western part of Kathmandu. Out of the positive cases, 11% of the hydatid cysts were found in lungs, 6% in liver and 4% in both lungs and liver. The prevalence rates were 26%, 25% and 5% in adult females, adult males and calves respectively. 79% of the cysts collected were fertile. The single cyst infection (60%) was more than the multiple cyst infection (40%).

In a similar study carried out in various localities of Banepa, Panauti and Dhulikhel Municipalities, 16.22% (73/450) of the slaughtered buffaloes were found to be positive for hydatidosis. Sex-wise prevalence rate of infection were 22.98%, 40.57% and 4.02% in male, female and calves respectively (Khatri, 2003).

A total of 429 buffaloes slaughtered for meat were examined for hydatid cysts in Kathmandu. Out of 429 buffaloes examined, 12.35% of the buffaloes were found to be infected with echinococcosis, 10.5% of the males and 13.9% of the females were found to be infected (Bajgain, 2004).

METHODOLOGY:

This epidemiologic surveillance for cystic echinococcosis was done during March to July 2009. The study was divided into following activities.

Quantifying the Prevalence of Echinococcosis in Buffaloes Slaughtered for Meat.

From March to August 2009, one hundred and fifty buffaloes slaughtered for meat were examined during their slaughter to find out the prevalence of hydatidosis in slaughtered buffaloes.

Study Area, Population and Data collection:

Slaughterhouses located at KMC Ward No. 15, 19 and 20.

Study population:

During the study period, 150 slaughtered buffaloes were examined at their slaughter places including both male and female buffaloes. But the male animals were few in number because most of the female buffaloes were slaughtered in the name of male buffaloes. Recording the age of the animals was also a difficult task except grouping the animals under two categories: young and adult animals.

Inspection and Data collection:

The slaughter places were daily visited in the morning at 3 am and the buffaloes slaughtered for meat were inspected thoroughly for hydatid cysts. Liver and lungs were the major organs inspected with care. All the necessary information about the animal was recorded daily for individual animal:

- Sex and age categories of the animal
- Presence or absence of the hydatid cyst
- Multiple or single cyst infection
- Organs infected by hydatid cyst

Sample Collection for Laboratory Analysis:

Hydatid cysts from positive cases were collected with tissues of associated organ and carefully kept in a clean plastic bottle added with a little cold water to prevent them from desiccation.

Measurement of the size of the Cysts:

The diameter of the Cysts was measured with the help of centimeter scales for twice to minimize the error and the average diameter was recorded.

Measurement of the volume of Hydatid Cystic Fluid:

The volume of cystic fluid was measured with measuring cylinder. The fluid of the larger cysts was collected in the cylinder after puncturing with needle and the fluid of very small cysts was measured in syringe itself without transferring into the cylinder.

Determination of the Fertility Status of Hydatid Cysts:

For the determination of the proportion of fertile cysts, the fluid was examined for the presence of protoscolices and daughter cysts and the germinal layer were examined for the presence of brood capsules.

RESULTS:

Prevalence of Echinococcosis in Slaughtered Buffaloes

Out of 150 buffaloes examined, 16% (24/150) were positive for hydatid cysts.

Prevalence of Echinococcosis in Male and Female

Among female buffaloes, 16.43% (24/146) were positive for hydatid cyst. But none of the male buffaloes examined were positive for the hydatid cysts. The following is the tabular representation of the result.

Table no. 1: Sexwise prevalence of echinococcosis in buffaloes.

Sex of buffaloes	Total examined	No. of positive cases	Percent (%)
Male	4	0	0.0
Female	146	24	16.43
Total	150	24	16

Organ wise prevalence of Echinococcosis in Buffalo:

Among 24 positive cases, 58.33% (14/24) of the animals were infected in lungs, 20.83% (5/24) in liver and 20.83% (5/24) in both lungs and liver. The result is shown in following chart.

Results of Prevalence of Hydatidosis in Human

Out of 214374 in-patients, 119 patients were found to be positive for hydatid cases surveyed in 5 major hospitals of Kathmandu Valley with the prevalence of 0.05551%. The prevalence (in percentage) in IOM, Bir Hospital, Kanti Children Hospital, Patan Hospital and Kathmandu Model Hospital were recorded as 0.07371, 0.05659, 0.09966, 0.01812 and 0.13156 respectively.

DISCUSSION:

The prevalence rate observed is higher than 8.5% (Sharma, 2008), 12.35% (Bajgain, 2004), 5% (Joshi, 1991), 13% (Joshi, 1973), and is lower than 18% (Joshi et al., 1996), 21% (Maharjan, 1996) and 19.5% (Bajracharya, 2009).

Bajracharya in 2008 as 87.17% in lungs, 2.56% in liver and 7.69% in both liver and lungs and 2.56% in Spleen.

Altogether 119 human patients were positive for hydatid cysts out of 214374 in-patients with a prevalence of 0.05551%. The prevalence of hydatidosis was found higher in females as 51.26% than in males as 48.74%. Sharma (2008) reported 0.03% prevalence in human involving 56.7% females and 43.3% males. More of the patients were of the 20-49 year age category. Most of the patients with hydatid cyst were belonging to the age category of 20-29 (28.57%) with a higher prevalence in female (64.7%) than male (35.29%). This was followed by the age category of 30-39 years comprising more females (72.22%) than males (27.77%).

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Progress Report on Epidemiological Pig Sentinel Farms Study Established in Mrigauliya VDC of Morang District and Itahari Municipality (Gaisar ward no. 7) of Sunsari District, Nepal

D. D. Joshi and Arjun Aryal

Results

The serum collected from the sentinel farm was subjected to Ag-ELISA in NZFHRC laboratory. The Ag-ELISA was conducted for samples collected every month. Serum samples were collected for eight times till now. The detail of the test result is presented below.

EITB and Ag-ELISA test result

Table 1: EITB test and bands present in the pig sentinel farm-established in eastern Nepal tested for cysticercosis

Tag number	Month	Test date	Band present
555	VII	16/5/2009	50
555	VIII	16/5/2009	50
555	IX	16/5/2009	50
555	X	16/5/2009	50
555	XI	16/5/2009	50
555	XII	16/5/2009	50

582	III	9/5/2009	50
582	IV	9/5/2009	50
582	V	9/5/2009	50
586	I	13/5/2009	50, 24
586	II	13/5/2009	50, 24
586	III	13/5/2009	50
586	IV	13/5/2009	50,24
586	V	13/5/2009	50
586	VI	13/5/2009	50
587	IV	14/5/2009	24
587	VII	14/5/2009	24
587	VIII	14/5/2009	24
587	IX	14/5/2009	24
587	X	14/5/2009	24
587	XI	14/5/2009	24
587	XII	14/5/2009	24
588	II	14/5/2009	24
588	III	14/5/2009	24
588	IV	14/5/2009	24
588	V	14/5/2009	24
588	VI	14/5/2009	24
588	VII	14/5/2009	24
588	VIII	14/5/2009	24
588	IX	14/5/2009	24
588	X	14/5/2009	24
589	VIII	15/5/2009	24
589	IX	15/5/2009	24
589	X	15/5/2009	24

Table 2: EITB and AG-ELISA test result

Pig tag number		Months												Post Mortem examination result	
		Bands present													
		1	2	3	4	5	6	7	8	9	10	11	12		
0545	EITB	-	-	-	-	-	-	-	-	-	-	-	-	Suspected cyst seen in liver and diaphragm muscle	
	Ag-ELISA	+	-	-	-	-	-	-	-	-	+/	-	-		
0555	EITB	-	-	-	-	-	-	50	50	50	50	50	50	Suspected T. hydatigena cyst seen in liver	
	Ag-ELISA	-	-	+/	-	-	-	-	-	-	-	-	-		
0556	EITB	-	-	-	-	-	-	-	-	-	-	-	-	T. hydatigena confirmed on PCR	
	Ag-ELISA	-	+/	+/	+/	+++	+++	+++	+++	+++	+++	+++	+++		
0560	EITB	-	-	-	-	-	-	-	-	-	-	-	-	Nothing found	
	Ag-ELISA	-	-	-	-	-	+	-	++	+	-	+/	-		
0579	EITB	-	-	-	-	-	-	-	-	-	-	-	-	T. hydatigena suspected	
	Ag-ELISA	-	-	-	-	-	-	+	-	-	-	-	-		
0580	EITB	-	-	-	-	-	-	-	-	-	-	-	-	Nothing found	
	Ag-ELISA	-	+/	+/	-	+	++	++	++	died	-	-	-		
0581	EITB	-	-	-	-	-	-	-	-	-	-	-	-	Suspected T. hydatigena cyst seen in liver	
	Ag-ELISA	-	-	-	-	+	-	+	-	-	+	+/	-		
0582	EITB	-	-	50	50	50	-	-	-	-	-	-	-	Suspected cyst in tongue	
	Ag-ELISA	-	+/	+/	-	-	-	-	+	+/	-	-	-		
0583	EITB	-	-	-	-	-	-	-	-	-	-	-	-	Suspected cyst in tongue and muscles of front leg	
	Ag-ELISA	+	-	-	-	-	-	+	+/	-	-	-	-		
0584	EITB	-	-	-	-	-	-	-	-	-	-	-	-	Nothing found	
	Ag-ELISA	-	+/	+	-	-	-	-	-	-	-	-	-		
0585	EITB	-	-	-	-	-	-	-	-	-	-	-	-	Nothing found	
	Ag-ELISA	-	+/	-	-	-	-	-	-	-	-	-	-		
0586	EITB	50, 24	50,24	50	50,24	50	50	-	-	-	-	-	-	Suspected cyst in liver and tongue	
	Ag-ELISA	-	-	-	-	-	-	-	-	-	-	-	-		
0587	EITB	-	-	-	24	-	-	24	24	24	24	24	24	Suspected degenerated cyst collected from liver and hind leg but confirmed negative by PCR	
	Ag-ELISA	-	-	+/	-	-	-	-	+	-	-	-	-		

0588	EITB	-	24	24	24	24	24	24	24	24	24	-	-	T. hydatigena cyst suspected in pancrease
	Ag-ELISA	-	-	-	-	-	-	-	-	+/-	-	-	-	
0589	EITB	-	-	-	-	-	-	-	24	24	24	died		Suspected poisoning
	Ag-ELISA	+/-	+/-	-	+/-	-	-	+/-	+/-	+/-	+	died		
590	EITB													
	Ag-ELISA	+/-	-	-	-	-	-	-	+	died				
0591	EITB	-	-	-	-	-	-	-	-	-	-	-	-	Cyst in liver
	Ag-ELISA	-	-	-	-	-	-	+	-	-	-	-	-	
0592	EITB	-	-	-	died									Tetanus
	Ag-ELISA	-	-	+/-	died									

Note: For Ag-ELISA, +/- means ratio in between 0.8 to 1.2.

NEWS:

World Animal Day (WAD) October 4, 2009 Celebrated in Nepal:

In Nepal World Animal Day (WAD) 2009 was organized jointly by National Zoonoses and Food Hygiene Research Centre (NZFHRC) Chagal, Kathmandu, Nepal and Shree Paropakar Adarsha Higher School, Bhimsensthan, Kathmandu, Nepal. An animal essay competition was the main theme of the WAD and main aim was to love animal and protect their rights. It was two months time competition. The output of school is given below separately with essay events. There was talk programme and Dr. Joshi gave the speech on the importance and role of animal in human life. All the essays article were compiled and is going to be published in book form with picture in near future.

Award Ceremony Participation at Paropakar Adarsha Higher Secondary School Bhimsensthan, Kathmandu, Nepal:

Total 70 students participated in essay competition from class 7 and 8. Out of which 20 participated in essay writing. Out of 20, top 10 and first, second and third were selected. The award was given first, second and third participants with certificate then top 10 were given gift with certificate. Certificate of appreciation was also given to the Principal Mr. Mohan Bahadur Nepali by Dr. D. D. Joshi, Executive Chairman of NZFHRC.

Free animal rabies vaccination campaign in ward no. 19 and 20 of KMC for WAD 2009 by NZFHRC. Altogether 159 animals were vaccinated against rabies. Of which there were one monkey and one cat rest were pet dogs. Out of 157 there were 91 male dogs and 68 female dogs.

"Joint International Tropical Medicine Meeting 2009":

Dr. Durga Datt Joshi, Executive Chairman, NZFHRC participated in the Joint International Tropical Medicine Meeting (JITMM) 2009 "Tropical Health in a Time of Economic Crisis" and 6th Seminar on Food and Water – Borne Parasitic Zoonoses (FBPZ6) 2-4 December 2009 Central Grand and Bangkok Convention Centre at Central World, Bangkok, Thailand. Three following technical papers were presented at JITMM an oral and poster presentation.

- a) "Human Cases of Swine Flu (Influenza A H1N1) Confirmed in Nepal"
- b) "Fascioliasis a Parasitic Food Borne Zoonoses Infection in Meat Animals of Kathmandu "
- c) Birdflu (Avian Influenza – AI) Outbreaks Detected First Time in Jhapa District of Nepal.

8th International Conference on Urban Health (ICUH):

Dr. Durga Datt Joshi, Executive Chairman participated in 8th International Conference on Urban Health (ICUH) October 18-23, 2009, Nairobi Kenya. In this conference Dr. Joshi has presented a paper on "Kathmandu Urban Ecosystem Health Project a Model Approach".

K.D.M.A. Research Award:

Please kindly submit your research work paper on allergy for trust award consideration by the end of December 2009 to KDMART office Chagal, G.P.O. Box 1885, Kathmandu, Nepal, Phone: 4270667 and Fax 4272694. This award was established by Dr. D.D. Joshi in 2049 B.S. on the memory of his wife, the late Mrs. Kaushilya Devi Joshi. The award includes a grant of NCRs. 10,001 with certificate.

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TO:

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