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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 *Taenia solium* CYSTICERCOSIS IN SWINE AND NEUROCYSTICERCOSIS IN HUMAN IN KATHMANDU VALLEY AND ITS IMPACT ON PUBLIC HEALTH

Anita Ale and Durga Datt Joshi, NZFHRC

INTRODUCTION

Human and porcine taeniasis/cysticercosis is one of the major zoonotic diseases in Nepal. Estimation by WHO indicate that 50 million persons primarily from developing countries are infected with taeniasis, and 50 thousand people die every year due to this disease (WHO, 2010). Up to 25% of the total population of Nepal, comprising of several ethnic groups, traditionally raise pigs usually for domestic and communal consumption. Hygienically poor and unsanitary husbandry and slaughtering practices are posing a persistent risk of diseases to the consumers (Joshi et. al., 2007). It is now emerging as a major public health problem of worldwide dimensions (Sciutto et al, 2000).

Human infection caused by adult tapeworm, belonging to the class Cestoda (Soulsby, 1982), *Taenia solium* and *Taenia saginata* (Joshi et al, 2007) and also by *Taenia asiatica* (Shulman, 1982) is referred to as taeniasis. Humans (the sole definitive hosts) and pigs (the common intermediate hosts) are the two different poles between which the transmission cycle exists. The infective stage of *T.solium* is *Cysticercus cellulosae* (cyst) in pig and adult form is an obligatory intestinal parasite for human beings. However, human beings may also get larval infection of these parasites known as cysticercosis (Garcia et al., 2003; Joshi et al, 2007 and Ngowi et al, 2008).

In Nepal, Rajbhandari (2003) reported that the epilepsy cases are increasing and up to 7.3 per 1,000 population may suffer from epilepsy and almost 50% of the total epilepsy cases are due to NCC. The infection is also present in India, Pakistan, Northern China, Thailand, and Nepal (Schantz *et al*, 1992). Joshi (1973; 1991) observed *Taenia* cysts in pig meat for the first time in Nepal. Joshi *et. al.* (2001a) showed that 23.5% (204 pig sera) by seroprevalence (ELISA) and 32.5% (419 pig tongues) prevalence by lingual palpation in Nepal. The work of Joshi and Willingham (2006) indicated that prevalence of lingual palpation (examination) of porcine cysticercosis was 10.5% (21/200) and seroprevalence by ELISA method was 22.5% (45/200). This can give a validation of examination by lingual palpation with serology. In several hospitals in the Kathmandu Valley, from 2002 to 2006, the proportion of epilepsy cases caused by neurocysticercosis ranged from 5 to 40%. The prevalence of porcine cysticercosis in Chitwan, Kathmandu and Lalitpur was reported to be approximately 19% (Pandey, 2007; Joshi *et al*., 2008).

OBJECTIVES

- To determine the prevalence of *T. solium* cysticercosis in swine by carcass examination, lingual examination and ELISA.
- To compare the results of lingual examination, carcass examination and ELISA
- To collect the suspected serum samples of epilepsy/Neurocysticercosis in human hospital i.e. Institute of Medicine (IOM), Maharajgunj.
- To get insight of the local epidemiology and assess the public health risk

MATERIALS AND METHOD:

Study Area

This study was conducted in Kathmandu valley. The Kathmandu valley consists of three districts as Kathmandu, Lalitpur and Bhaktapur, which share its boundaries with Kavrepalanchok district in the east, Makwanpur in the south, Dhading in the west, Nuwakot in the North and Sindhupalchok in the Northeast.

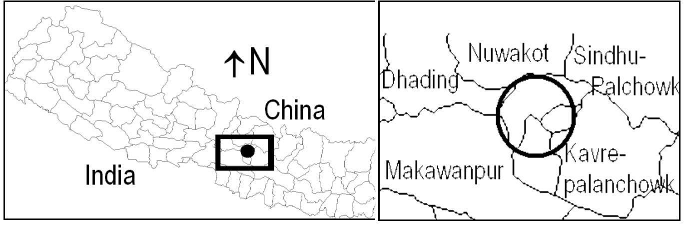


Fig 1: Map showing the location of Kathmandu Valley

This valley is located at an altitude of 1300 m from the sea level and extends about 25 km east to west and 20 km from north to south. The temperature in summer (May, June, July) ranges from 19.5ºC to 28.1ºC and in winter (October, January, February) ranges from 3ºC to 19.3ºC (NTB, 2009).

Collection and analysis of porcine serum

A total of 297 serum samples of pigs were collected from 6 slaughter facilities form Kathmandu (97 samples), Lalitpur (100 samples) and Bhaktapur (100 samples) during random visits from April to July

2010. Enzyme-Linked Immunosorbent Assay for the detection of circulating antigen (Ag-ELISA) was conducted in National Zoonoses and Food Hygiene Research Centre (NZFHRC), Kathmandu. For this study, the sandwich antigen-ELISA as described by Dorny *et. al.,* (2000) and adapted by Dorny *et. al.* (2004) was used. This test makes use of the IgG type monoclonal antibodies developed for the diagnosis of *Taenia saginata* cysticercosis (Van Kerckhoven *et. al*., 1998), but cross-reaction makes it possible to use these antibodies for the diagnosis of *T. solium* cysticercosis as well (Brandt *et. al.,* 1992).

Collection and analysis of human serum

A total of 22 serum samples were obtained from clinically suspected cases of epilepsy/Neurocysticercosis reporting at the OPD, virology laboratory, Institute of Medicine (IOM) Teaching Hospital, Maharajgunj. This serum samples were collected by staff of the hospital then this serum samples were brought to NZFHRC lab for ELISA test. This test was conducted during the month of April – July 2010 at NZFHRC.

RESULTS

Results of Laboratory analysis (ELISA)

Table no. 1. Serum ELISA based prevalence of cysticercosis in pigs slaughtered for meat in Kathmandu Valley

District	Number	Positive	Prevalence (%)	95% CI*
Kathmandu	97	19	19.59	12.59 to 28.38
Lalitpur	100	29	29.00	20.75 to 38.45
Bhaktapur	100	39	39.00	29.82 to 48.81
Total	297	87	29.29	24.33 to 34.66

*Mid point exact confidence intervals

The suspected human serum samples were categorized into 7 age class-intervals. In this study we found that the age class-interval between 21-30 was high in prevalence (Fig. 1). Out of 22 suspected serum samples (10 males and 12 females) 3 were positive (2 males and 1 female) (Fig. 2).

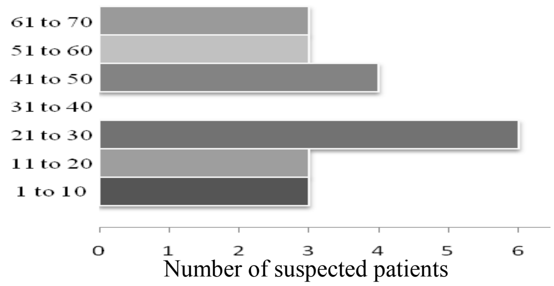
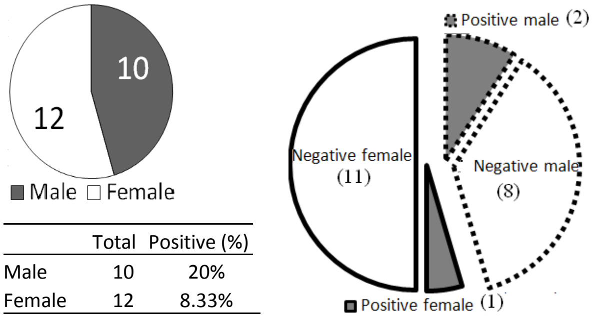


Figure 1: Agewise distribution of 22 human patients suspected for neurocysticercosis from IOM hospital



	Total	Positive (%)
Male	10	20%
Female	12	8.33%
Total	22	13.64%

Fig 2. Positive ELISA reactors for Neurocysticercosis in human samples (IOM)

DISCUSSION

The study showed that most of the farmers and abattoir workers were literate up to primary school but they lack adequate knowledge about the sanitation and hygiene. Low level of sanitation and hygiene have been considered risk factors for the transmission of zoonotic diseases (Joshi et. al., 2007).

The prevalence of porcine cysticercosis was found as 0.00%, 0.00% and 29.3% based on lingual, carcass and serum examination (ELISA) of 297 pigs respectively. Joshi *et al.* (2006) reported 10.5% prevalence in lingual examination and 20.5% on carcass examination for porcine cysticercosis in 200 pigs in Kathmandu valley in 2005. Pandey (2007) reported 0.63%, 0.94% and 19% prevalence of porcine cysticercosis by lingual, carcass and serum (EITB) examination respectively. Sapkota, (2005) reported 0.99% of porcine cysticercosis on carcass examination in Kathmandu valley. The increase in prevalence obtained in this study may be due to different sources of slaughter pigs, downgrading management of pig farming and decrease in the sanitation and hygiene. Karna (2009) reported 0.0%, 0.05% and 35.5% prevalence of porcine cysticercosis by lingual, carcass and serum (ELISA) examination respectively. The prevalence of porcine cysticercosis by serum is higher possibly due to the different sources of slaughter house, management and control of cysticercosis.

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VLIR FINAL PROJECT REVIEW WORKSHOP

"Impact Assessment and Control of Cysticercosis in the Indian Subcontinent Country: India/Nepal 2006-2010"

VLIR final project review workshop was organized by NZFHRC at United World Trade Centre, Tripureshwor, Kathmandu, Nepal on 9th July 2010. The one day workshop on "**VLIR Final Project Review Workshop of Impact Assessment and Control of Cysticercosis in the Indian Subcontinent Country: India/Nepal**". This four year project started from 1st September 2006 and ended on 31st August 2010. This is our final year review workshop. In this workshop there were two guests one Prof. Dr. P. Dorny from Gent University, Belgium and second Prof. Dr. V. Rajshekhar Neurologist, Neurological Department Christian Medical College, (CMC) Vellore, India. There was a joint agreement between three institutions 1. Gent University, Belgium, 2. Christian Medical College (CMC), Vellore, India and National Zoonoses and Food Hygiene Research Centre (NZFHRC), Kathmandu, Nepal to work on Taeniasis/Cysticercosis both in human and pig.

The objectives of this workshop were as follows:

1. To present the progress review made by three project implementing agencies/institutions like NZFHRC, Katgnabdy, Gent University Belgium, and Christine Medical College Vellore, India during the project period.
2. To review the serological results of taeniasis/cysticercosis prevalence both in human and porcine in Nepal.
3. To present the summary report of PhD Thesis of one candidate who completed her PhD Degree in this project.
4. To discuss about the present situation of taeniasis/cysticercosis in both human and pig particularly on diagnosis, prevention, control and future planning and develop recommendation by the participants for future.

POST EXPOSURE TREATMENT OF RABIES CASES IN TEKU INFECTIOUS DISEASE HOSPITAL KATHMANDU DURING THE YEAR 2001 TO 2008

Durga Datt Joshi, Stephanie Depraz,
Natasha Lee and Basu Dev Pandey

INTRODUCTION

Rabies is a fatal zoonotic disease causing an estimated 55,000 human deaths annually worldwide, with about 31,000 in Asia, and 24,000 in Africa. Every year, more than 15 million people worldwide receive a post-exposure treatment against Rabies (WHO, 2008). Shukraraj Tropical and Infectious Disease Hospital is a government hospital in Kathmandu. There is a rabies post exposure treatment section where people come when they are bitten by suspected rabid animals like monkeys, cats, tigers and especially by dog. They get treatment free of cost at the government hospitals.

OBJECTIVES

To describe bite cases from rabies suspected animals, post exposure treatment (PET), with 3 (Day 0, Day 3, Day 7) or 5 injections (Day 0, Day 3, Day 7, Day 14, Day 30), depending on the situation and cases of hydrophobia from hospital based data.

METHODOLOGY

Cases requiring PET, hydrophobia cases, dog and other animal bite cases as well as suspected dog bite associated human cases for the year 2001 to 2008 were recorded from the hospital database for further analysis.

RESULTS

Patients were using the vaccine called Indirab™ (a vero cell rabies vaccine), which is given 5ml intramuscularly. If the bite is on the head Human Rabies Immunoglobulin 20IU or 40 IU is also given intramuscularly. This is not free and has to be bought by the patient party. PET cases recorded in the hospital is shown in table 1.

Table no. 1: PET cases recorded in Shukraraj Tropical and Infectious Disease Hospital during the year 2001 to 2008

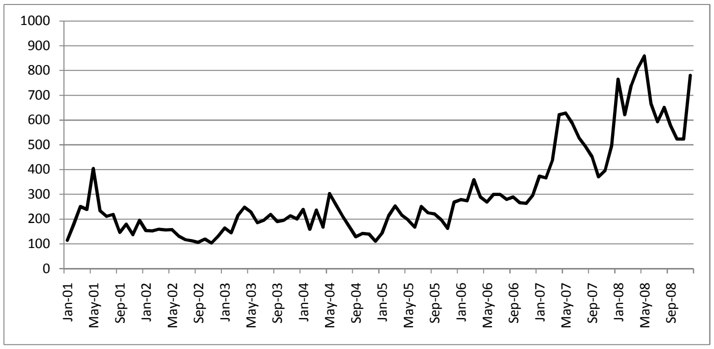
Year	2001	2002	2003	2004	2005	2006	2007	2008
Total bites	2539	2005	2783	2956	3043	3859	6649	9826
Dog bites	1743	1595	2398	2264	2512	3461	5755	8109
Percentage	68.64	79.55	86.16	76.58	82.55	89.68	86.55	82.52

Hydrophobia cases during the year 2001 to 2008 are in Table 2. ND indicates no data available for those years.

Table no. 2: Hydrophobia cases recorded in Shukraraj Tropical and Infectious Disease Hospital during the year 2001 to 2008

Sex ↓ \ Year→	2001	2002	2003	2004	2005	2006	2007	2008
Men	ND	ND	ND	ND	9	7	8	4
Women	ND	ND	ND	ND	0	5	3	4
Total Hydrophobia death cases	ND	ND	ND	ND	9	12	11	8

Number of suspected dog bites human cases by month during the year 2001 to 2008 is shown in graph no. 1. On average, since 2001 to 2008, 39.7% of the victims were children below 15 years.



On an average, since 2001 to 2008, 75.6% of the victims were men. Children were 35 to 45% victims. Total PET cases admitted increased from 1009 to 3657 during the year 2003 to 2008 respectively.

CONCLUSION

In conclusion, with the datas of the Teku hospital between 2001 and 2008, on average 46% of people who have been bitten by a dog and went to the Hospital for a PET (Post Exposure Treatment) are men, and adult above 15 years old.

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NEWS

Nepal Academy of Science and Technology Award:

Nepal's Science and Technology Academy (NAST) Award was given to our honorable Dr. Durga Datt Joshi, Executive Chairman of the National Zoonoses and Food Hygiene Research Centre for his contribution on animal-transmitted diseases and viral encephalitis and for helping examination, prevention, control, and treatment of zoonotic diseases for the year 2009/2010. Dr Joshi received this award at the 30th Academic Assembly of NAST, held on November 29, 2010. The Prime Minister and NAST Chancellor Madhav Kumar Nepal presented the award, the highest scientific recognition in Nepal. The award carried a cash prize of NRs. 1,00,000 with certificate.

National Workshop on Rabies Control Strategy of Nepal:

Institute of Agriculture and Animal Science (IAAS), Tribhuvan University (TU) Rampur campus organized a one day "National Workshop on Rabies Control Strategy of Nepal", which was held on 12 Dec. 2010 (26 Mangsir 2067) at IAAS Rampur, Chitwan, Nepal. National Zoonoses and Food Hygiene Research Centre (NZFHRC) was co- organizer of this workshop. Dr. D. D. Joshi presented following two papers:

a. "Review of National Strategic Rabies Control Plan in Nepal"
b. Role of National Zoonoses and Food Hygiene Research Centre and Associated with Rabies Control Programme in Nepal

2nd Conference of Veterinary Practitioner Association of Nepal (VPAN):

VPAN's 2nd two day conference was held at Himalaya Hotel, Kupondole, Lalitpur on November 19- 20, 2010. The main theme was "Empower veterinary practitioners through **Continuing Education Program** in clinical and academic fields for the betterment of animal health services in Nepal". Dr. D. D. Joshi participated in this conference.

Quality Standard of Meat and Meat Products Meeting:

Dr. Durga Datt Joshi, Executive Chairman, NZFHRC participated meeting on **"Quality Standard of Meat and Meat Products"** on 29 December 2010. It was organized by National Food Knowledge Centre Kathmandu.

The 1st Ecohealth Network Meeting:

Dr. Durga Datt Joshi, Executive Chairman, NZFHRC will be participating in **"The 1st Ecohealth Network Meeting".** Meeting venue will be in Sea View Resort and Spa, Koh Chang, Trat Province, Thailand, 29-31 January 2011. The aim of the meeting is to network and regional chapter of International Association for Ecology and Health (IAEH). The main purpose of the project is to organize the meeting among ecohealth researchers in order to 1) brainstorm on the organization, function, future direction and formally launch the integrative "Ecohealth Network" in Asia;; 2) explore the possibility to establish the Regional Chapter, "Asian Association for Ecology and Health" (AAEH), of the International Association for Ecology and Health (IAEH); and 3) provide a platform for face-to-face interaction, multi-country collaboration and information sharing in the field of ecohealth.

K.D.M.A. Research Award:

Please kindly submit your research work paper on allergy for trust award consideration by the end of December 2010 to KDMART office Chagal, G.P.O. Box 1885, Kathmandu, Nepal, Phone: 4270667, 4274928 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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