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Community Knowledge, Attitudes and Practices on Bovine Tuberculosis and Associated Risk Factors in the Population of a Rural Block Area of Singur, Hooghly, West Bengal

Dr. Charupriya Churamani[1*], Dr. Atul Raj[2], Dr. Sayan Bhattacharyya[3], Dr. Amit Banik[4]

[1]Masters in Veterinary Public Health (MVPH) student, All India Institute of Hygiene and Public Health (AIIH&PH), Kolkata, India
[2]Associate Professor and HOD, Microbiology, All India Institute of Hygiene and Public Health (AIIH&PH), Kolkata, India
[3],4Assistant Professor, Microbiology, All India Institute of Hygiene and Public Health (AIIH&PH), Kolkata, India

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***Corresponding author:** Dr. Sayan Bhattcharyya

Abstract **Original Research Article**

Bovine tuberculosis (BTB) is a zoonotic disease transmitted from infected animals to humans through close contact and ingestion of raw animal products. A cross-sectional study was conducted to assess knowledge, attitude and practice within the community regarding BTB and associated risk factors over a period of 2 months from December 2018 to February 2019 in Singur, Hooghly (W.B.). A structured pre -tested questionnaire was self-administered by the consented study participants in the area. A total of 109 (48.6% males and 45.8% females) respondents were selected of which 90% of participants had least one cattle in their homes mainly for the purpose of milk production and the remaining 10% were non-cattle owners. Among the cattle owners we found about 26.5% of the animals were sick, and 48.9% had persistent cough present. Only 9.17% of the surveyed population had heard about BTB while the rest were completely unaware. And 96.6% of the population had no knowledge regarding the disease transmission, while only 1.83% of the population was aware that transmission occurs via raw animal products. 27.5% of the population believed that it is a communicable zoonotic disease on the other hand 47.1% didn't hold any form of knowledge. Among all the participants 5.5% had TB patients within the family members. Veterinarians, public health specialists and human health care service organisations need to emphasis more on the spread of the knowledge of BTB through creation of various programs and activities as majority population is of cattle owners and farmers.

Keywords: Singur, Bovine Tuberculosis, livestock, Awareness.

INTRODUCTION

Tuberculosis (TB) is among the top public health threats globally (WHO, 2014). A zoonotic form of tuberculosis (TB) in people is caused by *Mycobacterium bovis*, which belongs to the *M. tuberculosis* complex. It often affects sites other than the lungs (extra-pulmonary), but in many cases is clinically indistinguishable from TB caused by *M. tuberculosis* [1].

Within animal populations, *M. bovis* is the causative agent of bovine TB. *M. bovis* mainly affects cattle as well as range of wild animal species. It results in important economic losses and trade barriers with a major impact on the livelihoods of poor and marginalized communities [2].

As per a WHO survey in 2016, there were an estimated 147, 000 new cases of Bovine Tuberculosis (BTB) in people globally, and 12,500 deaths [3]. The African region carries the heaviest burden, followed by the South-East Asian region [4]. Bovine tuberculosis in humans is an important public health concern in developing countries. Various suveys on socio-economic conditions indicated that low standard in the living areas for both animals and humans was having a significant contribution to TB.

Transmission of infection to humans due to *M. bovis* is mainly through drinking of contaminated or unpasteurized raw milk and eating undercooked meat. Some authors have suggested the probable increase in transmission rates was due to the high prevalence of TB

in cattle, close contact of cattle and humans and the increasing prevalence of HIV in humans [5]. The true burden of zoonotic TB is likely to be underestimated due to a lack of routine surveillance data from most countries [6].

Bovine TB is endemic in animal populations throughout much of the world. This study was conducted in Singur area, and it assessed the knowledge, attitudes and practices (KAP) of the community towards bovine tuberculosis as well as the status of risk factors present. In our country, people and domestic animals live closely together, and the consumption of raw animal products and by-products presents a potential risk factor to acquire BTB. Impacts and information regarding BTB in India in general, particularly in the region of study, have not been clearly identified.

MATERIALS AND METHODOLOGY

Study area

This study is conducted in the census town Singur CD block in Chandannagore subdivision of Hooghly district in the Indian state of West Bengal between December 2018 and February 2019. It is situated on the Ganges delta around 37 km away from the metropolitan city Kolkata ,comprising of several villages like Purshottumpur, Dewan Bheri, Sahanapara, Beleghata, Boyspara, Nasibpur, Hakimpur, Nanda, Habos Pota, etc. Map of the area is shown in Figure 1 below.

Fig-1: Map of Singur in West Bengal

The main source of livelihood in the region mainly is through crop production, workers and labourers and livestock rearing. The majority of animals were reared by small farmers in an intensive system. The livestock populations owned by most of the farmers were small in number not exceeding more than 3 cattle per farmer.

Study population

The study was conducted at the household level with 90% households rearing only cattle and 10% non-cattle owners or some other species of domestic animals.

A non-randomised purposive sample of 100 individuals is drawn using the formula as stated in Thrushfield (2007):-

ss (sample size) = Z2 x p x (1-p)/d2

Where, **Z** = z value (i.e.:**1.96** for 95% confidence interval)
p=estimated proportion of population (**0.5**)
d=degree of freedom (**10%**)

In Singur the most dominant livestock species is cattle, the area was selected based on the abundance of cattle and transport connectivity.

Study design

A cross-sectional study was performed using a structured questionnaire which was administered to the selected participants. 99 cattle owners and 10 non-cattle owners were interviewed across 3 villages of Singur area which were purposefully selected. Close ended questions were asked regarding the health status of their animal, livestock husbandry, source of animal's treatment and routine care, watering, feeding,

production system & dairy hygiene. Along with this questions related to human hygiene, source of water, housing and waste disposal, habits of human consumption of animal products and by-products, contacts between humans and cattle, BTB knowledge and known current or previous history of TB status in their households.

The collected data were entered into Microsoft Excel data sheets and analyzed. Different statistical analytical calculations were applied to generalize the effects of the study in the area and use it to generate public awareness regarding the disease.

RESULTS

Socio-demographic pattern of the study participants

In the current study the total 99 study population was considered out of which 53(48.6%) are males & 46(45.8%) are females. They were divided into 4 age groups of which the majority population lies in the age bracket of 25-45 years of age comprising 48 (44%) of the total population. 46.6% of the population has education up to high school while only 4.5% have received no form of formal education (See Table 1).

Majority of the village men are involved in service sector and farming holding minimum 2 cattle in each household, from the surveyed population 98 people were cattle owners while 11 were non- cattle owners. About 55%(60) of the population has an income in the range of Rs. 6000-10,000 which is the revenue earned without addition of the farming profits. The monthly income generated by the people of purely indulge in farming is relatively low.

Livestock holding characteristics and husbandry practices

About 98 (89.9%≅ 90%) of the studied population were cattle owners while 11 (10.0%) are non-cattle owners. It was found that among the 90% of the cattle owners only 10% were aware about vaccines available against BTB. The 36.6% of the cattle owners actually paid attention towards vaccination of their cattles within which only 13(11%) were regular while 24.7% were unaware about the concept of vaccination in animals itself.

In table 2, it was found that 57(52.2%) of the cattle rearers routinely clean the udder while 29(26.6%) are irregular and infrequent in udder cleaning especially before and after milking while 12 (11%)do not follow the practice of cleaning the udder at all. Among the 52.2% of the people who practice cleaning of udders only 3(2.7%) clean using soap and water while 24 (22%) use oil and other substances like soil, etc. The milking practice in the study population wasn't properly followed as 31(28.4%) owners do not wash the milking pails at all. Picture of cattle shed is found in Figure 2.

From the 90% owners of cattle we found that 60 (59.6%)people shared the same house as their cattle and 57(52.2%) used the same source of water bodies for cleaning of utensils, clothes as well as animals and this was the same source of drinking and cooking water for these families. One major drawback found was 73(66.9%) people were not well aware about their local veterinary doctors and preferred the local para-vets for all types of animal treatment and healthcare which is a leading factor for low productivity, poor health, ineffective treatments and low economic gain.

Table-1: Socio-demographic characteristics

Characteristics	Frequency	Percentage (%)
Sex of respondent		
Male	53	48.6%
Female	50	45.8%
Age		
15-25	20	18.3%
25-45	48	44%
45-65	26	23.8%
>65	14	12.8%
Education		
Illiterate	5	4.5%
Primary	26	23.8%
Middle school	27	24.7%
High school	46	42.2%
Graduate	4	3.6%
Post graduate	1	0.91%
Monthly income		
INR 1000-5000/-	46	42.2%
INR 6000-10000/-	60	55%
INR >10000/-	3	2.7%

Fig-2: Cattle shed in Singur

Table-2: Dairy management practices

Practices	Frequency	Percentage(%)
1. Cleaning of udder		
Yes	57	52.2%
No	12	11%
Sometimes	29	26.6%
2. Materials used for udder cleaning		
Water	49	44.9%
Water and soap	3	2.7%
Oil	24	22%
Others	8	7.3%
3. Cleaning of milking pails		
Yes	68	62.3%
No	31	28.4%
4. Post-milking hand wash		
Yes	23	21.1%
No	86	78.8%
5. Pre-milking hand wash		
Yes	66	60.5%
No	43	39.4%
6. Same source of water		
Yes	65	59.6%
No	44	40.3%
7. Share the same home		
Yes	57	52.2
No	52	47.7

Study participant's knowledge of TB

During the study it was found that only 10% of the study population is aware of bovine tuberculosis and effects of Tuberculosis on animals and vice-versa. It was found that most of the aware population were educated beyond middle school however the majority of the unaware population of 64(58.7%) lied in the age group of 15-45 years which is the young and active population.

Table-3: Awareness regarding cure of TB based on educational level

Education level	Yes (curable)	No (not curable)	Grand total
Illiterate -primary	17	14	31
Middle- high school	41	33	74
Graduate-post graduate	4	0	4
Grand total	62	47	109

Table-4: study participants' knowledge of T.B.

Characteristic	Frequency	Percentage (%)
Aware od Bovine T.B.		
Yes	10	9.17%
No	99	90.8%
Transmission		
Raw animal products	2	1.83%
Other routes	6	5.50%
Unaware	101	92.6%
TB in family		
Yes	37	33.9%
No	72	66%
Aware of DOTS		
Yes	9	8.25%
No	10	9.17%
Source of Treatment		
Quacks	8	7.33%
Hospitals	30	27.5%
Is TB zoonotic		
Yes	30	27.5%
No	78	71.5%
Source of TB knowledge		
Media	22	20.1%
School	4	3.6%
Hospital	28	25.6%
Others	55	50.4%
Is TB curable		
Yes	62	56.8%
No	47	43.1%

Health condition of the study participant's animals

During the study we found that the more population had healthy milking animals with 71(65.1%) of the participant's animals giving a milk yield of 4-7lit per day. Among them 26(23.8%) had sick animals at the time of the survey and 73(66.9%) of the owners of the sick animals relied on the para-vets for treatment and only 24(24.4%) owners chose to seek professional medical health facilities from a government hospital.

Table-5: animal health

Characteristics	Frequency	Percentage (%)
Is the animal sick?		
Yes	26	23.8%
No	72	66%
Weight loss		
Yes	40	36.6%
No	58	53.2%
Milk production		
Yes	68	62.3%
No	30	27.5%
Quantity per day		
1-4 lit.	28	25.6%
4-7 lit.	71	65.1%
Change in milk consistency ?		
Yes	29	26.6%
No	80	73.3%

Table-6: Awareness of Bovine TB

Age	Yes	no	Grand total
15-45 yrs	4	64	68
45-65 yrs	5	24	29
>65 years	1	11	12
Grand total	10	99	109

Table-7: Awareness of Bovine TB at different educational level

Education	yes	no	Grand total
Illiterate-primary	0	31	31
Middle-high school	9	65	74
Graduate-postgraduate	1	3	4
Grand total	10	99	109

Animal product consumption practices

It was observed that majority of the study population is aware about the demerits of consumption of raw milk however, there are still 22%(24) of the study participants who believe drinking raw milk is not even just healthy but also holds several health benefits against several was diseases. When it comes to meat consumption 65 (59.6%) consume it among which only 1 (1.5%) was found to consume meat in raw form while 50(76.9%) of the consumers preferred their meat to be fully cooked and only 14 (21.5%) consumed a partially cooked meat (See table 4, 8, 9).

Table-8: Animal product consumption

Characteristics	Frequency	Percentage (%)
Milk		
Raw	19	17.4%
Regularly boil	78	71.5%
Sometimes boil	12	11%
Boiling time		
10 min.	58	53.2%
15 min.	24	22%
30 min.	13	11.9%
1 hour	14	12.8%
Meat		
Always cook	50	76.9%
Partially cook	14	21.5%
Raw	1	1.5%

Table-9: Consumption of raw milk

Education level	Yes	%-age	No	%-age	Grand total
Illiterate-primary	12	11%	19	17.4%	31
Middle-high school	12	11%	62	58%	74
Graduate-postgraduate	0	0	4	3.6%	4
Grand total	24	22%	85	77.9%	109

Table-10: Consumption of meat

Educational levels	raw	Partially cooked	Fully cooked	N/A	Grand total
Illiterate-primary	0	13	8	9	31
Middle-high school	1	1	37	34	74
Graduate-postgraduate	0	0	1	1	2
Grand total	1 (1.5%)	14 (21.5%)	50 (76.9%)	44	109

DISCUSSION

This study indicated that the majority of the rural community members in the study area had no basic awareness of BTB. There is also a gap of knowledge about the etiology and the transmission modes from animals to humans. On this basis, the implementation of proper community-based health education is essential to raise community knowledge about TB[7]. Hence, it is advisible to introduce the community awareness program about BTB transmission through different communication media and health education program integrated with the animal health care system is necessary to raise community awareness

of BTB in the area. This type of study has also been carried out from other parts of our country but not from the Eastern region [8, 9]. The milk consumption practices in the area are another intervention zone where the health education is needed. Veterinarians and human health care service organizations should focus more on community workers, paying more attention to awareness creation programs through various activities aimed at addressing the knowledge about BTB. Most importantly, rising awareness of the cattle owners of BTB and its transmission, and the zoonotic implication of BTB are of extreme importance for effective implementation of TB control measures. Further studies are needed in this regard.

CONCLUSION

Awareness among milk rearers, especially in the rural region, is essential for prevention of Bovine tuberculosis.

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REFERENCES

1. Sharma RD, Kumar M, Sharma MC. Textbook of preventive veterinary medicine and epidemiology, New Delhi, Directorate of information and publications of agriculture, Indian council of agricultural research.2010.
2. Park K. Park's textbook of preventive and social medicine, 23rd edition 2015. Jabalpur, India. Brijmohan Bhanot.
3. https://www.who.int/tb/areas-of-work/zoonotic-tb/en/. Last accessed 10/5/19.
4. World Health Organisation. Zoonotic tuberculosis. 2017
5. https://www.who.int/tb/zoonoticTB.pdf. Last accessed 10/5/19.
6. Asebe Geahun, Gudina Eshetu. Community knowledge, attitudes and practice on bovine tuberculosis and associated risk factors in Gambella regional state lare woreda, southwest Ethiopia. https://www.researchgate.net/profile/Getahun_Asebe/publication/326439300_Knowledge_attitude_and_practice_of_of_community_about_bovine_tuberculosis/links/5b4d8d4a0f7e9b240fe50b6c/Knowledge-attitude-and-practice-of-of-community-about-bovine-tuberculosis.pdf.n2018. Last accessed 10/5/19.
7. Rathore MS, Jain J, Dixit M. A cross sectional study to assess the knowledge, attitude and practice regarding tuberculosis among the patients at GMCH, Udaipur (Rajasthan). International Journal Of Community Medicine And Public Health. 2017 Oct 25;4(11):4272-6.
8. Thrustfield M. Veterinary epidemiology, 3rd edition 2007. Blackwell Science Ltd, a Blackwell Publishing company.2007.
9. World health organization (WHO). Global tuberculosis report. Geneva, Switzerland. WHO press. 2014:1-147.
10. Yadav SP, Mathur ML, Dixit AK. Knowledge and attitude towards tuberculosis among sandstone quarry workers in desert parts of Rajasthan. Indian Journal of Tuberculosis. 2006 Oct 1;53(4):187.