BOVINE TUBERCULOSIS: HOW TO SPOT AND REPORT THE DISEASE

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ABSTRACT Bovine tuberculosis is a chronic bacterial disease of cattle caused by Mycobacterium bovis. In many countries, bovine tuberculosis is a major infectious disease of cattle, other domesticated animals and certain wildlife populations. It has a public health significance. Bovine tuberculosis is usually diagnosed in the live animals based on the basis of delayed hypersensitivity reactions using various tuberculin tests such as single intradermal, comparative intradermal, short thermal and stormont tests. Infection of bovine tuberculosis is often sub clinical; when present, clinical signs are not specifically distinctive. After death, infection is diagnosed by necropsy, histopathological and bacteriological examination and biochemical tests. A Bovine TB is difficult to diagnose with clinical signs alone. In the early stages of TB, clinical signs are not visible. In later stages, clinical signs may include: emaciation, lethargy, weakness, anorexia, low-grade fever, and pneumonia with a chronic, moist cough. Lymph nodes may also be enlarged. The aim of this study to diagnose bovine tuberculosis by physical, clinical and chemical techniques.

INTRODUCTION

Bovine tuberculosis is a threat to animals and human health in several countries. Bovine tuberculosis (TB) is a chronic disease of animals caused by a bacteria called *Mycobacterium bovis*, (M.bovis) which is closely related to the bacteria that cause human and avian tuberculosis. This disease can affect practically all mammals, causing a general state of illness, coughing and eventual death. The name Tuberculosis comes from the nodules, called 'tubercles', which form in the lymph nodes of affected animals. Until the 1920s when control measures began in developed countries, it was one of the major diseases of domestic animals throughout the world. Today TB remains an important disease of cattle, wild animals.

The disease is zoonotic. This means the bacteria can be transmitted to humans. This transmission can occur via aerosol droplets but the most well-known method is by drinking unpasteurised milk contaminated by an infected cow. Pasteurising milk is said to destroy any M. bovis bacteria present. It has been suggested that the disease can also be transmitted by the ingestion of contaminated meat which has not been adequately cooked.

Cattle found to be more susceptible to the bacteria are considered to be the younger population although all cattle can become infected. The bacteria are usually transmitted via aerosol droplets. This usually occurs when an unaffected animal inhales contaminated droplets expelled by an infected animal through coughing and sneezing. The signs and symptoms observed include coughing, laboured breathing, and weight loss.

MATERIALS AND METHODS

Study Area

My study area was confined to Indore city. Indore is a major city and commercial centre of the state of Madhya Pradesh in central India. The exact geographical Indore location is at 22º43'north latitude and 75º 49'60" east longitudes. Indore is located at an elevation of 1791 feet or 545 meters above sea level. Indore is the largest city in the state of Madhya Pradesh in India. Indore is located in Malwa region in west central part of Northern India occupying a plateau of volcanic origin in the western part of the state of Madhya Pradesh. My study area was in and around Indore city.

Population studied

Bovine tuberculosis is a chronic bacterial disease of animals and humans caused by Mycobacterium bovis. This reaserch concentrates on Bovine tuberculosis as such a study has not been done in this region so far. It involves thorough survey in Indore region

Study design

A cross sectional study was done in some randomly selected dairy farms in and around Indore city to determine individual animal prevalence of bovine tuberculosis. For convenience the study was divided into four zones that is East, West, North and South.

**Following diagnostic tests were performed in cattle.**

Physical – General body condition, body coat, superficial lymph nodes and auscultation of chest were examined.

Clinical – Cough, appetite, nasal discharge, color of conjunctiva and body temperature were recorded.

Chemical – Acid fast staining procedures - Ziehl- Neelsen procedure for milk, swab/sputum and faecal matter were performed.

Table-1: Prevalence of M. bovis in infected Cattle and Buffaloes in studied Zones of Indore City

	Total number of Cattle examined	No. of Cattle positive	Total no. of Buffaloes examined	No. of Buffaloes positive
No. of Animals	465	28	45	06
Prevalence of *M. bovis*	6.02 %		13.33 %	

Prevalence percentage of Bovine Tuberclosis in Indore
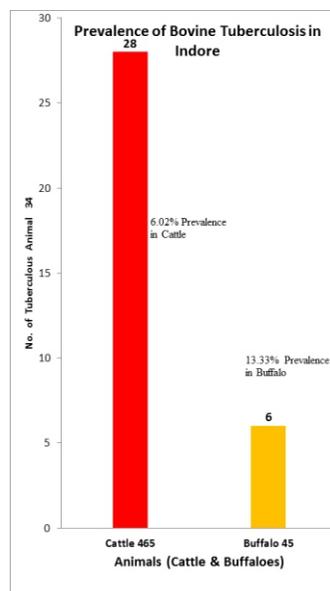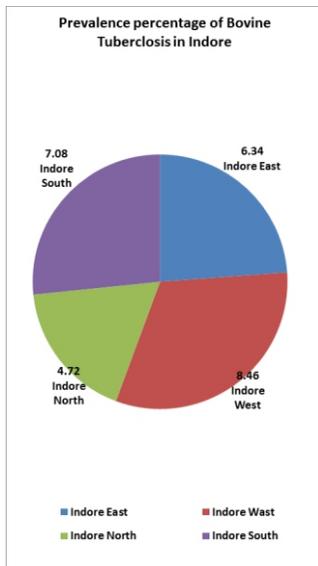
cattle included in the present study were Indigenous breed. It has been noticed that the differences in BTB prevalence between breeds as observed in several studies can be influenced by different husbandry conditions (Vordemeier et.al., 2012). Age was the main risk factor, the incidence of bovine tuberculosis in animals below 5 years of age was recorded to be 2.31 percent, while it was 13.04 percent in animals above 5 years of age. Many authors suggest that it could be related to increased duration of exposure with age, with older cattle being more likely to have been exposed then younger (Cleaveland .et al., 2007; Cook 1996). The prevalence rate was higher in females (7.04 percent) as compared to males that is 4.28 percent. The analysis of BTB reactors according to gender showed higher reactivity of females than males. Prevalence rate of bovine tuberculosis was observed in four different zones in Indore city. The incidence was higher 8.46 percent Indore West zone and 7.08 percent in South zone .while it was lower in North zone (4.72 percent) and East zone (6.34 percent). Overall, prevalence for the M. bovis (Acid Fast Bacteria) to all 510 examined animal has also been noticed for Indore East, Indore West, Indore North and Indore south as 6.34 percent, 8.46 percent, 4.72 percent and 7.08 percent respectively. The higher rate of incidence was due to unhygienic conditions of animal husbandry.

In the present study animals were broadly put into two major groups including 476 animals of control group (G-1) and 34 cases of experimental group (G-2).Common and specific symptoms were studied. The distribution of subjects belonging to various groups is shown in Table no. 02 . The most common symptom in experimental group was found to be pale mucous membrane (82.35 percent). In all the animals of control group the mucous membrane found to be pink and normal. The infected cattle were generally emaciated (70.58 percent) and body coat was found to be staring (64.70 percent). But in control group the cattle and buffalo were found to be healthy. The body coat was to be shining in control group. Cough was found in 11.76 percent in experimental group, in control group the cough was not detected . Loss of appetite was the another important and common symptom found maximally in infected cattle (58.82 percent). The appetite was to be normal in control group. As the animals were generally emaciated, the conjunctiva was found to be pale and animals grossly anemic in experimental group (82.35 percent). In the control group the conjunctiva was detected to be pink. The nasal discharge was persisting throughout the observation period in all the infected cattle. Abnormal respiration with peculiar sound was observed in most of the infected cattle (58.82 percent). No abnormal nasal discharge was seen in control group. Enlargement of lymph nodes were observed in 11.76 percent infected animal. In the control group lymph nodes was not palpable.Auscultation of chest revealed dry rales 17.64 percent and moist rales in 8.82 percent cases. In some of the animals rales could be detected in both the lung during observation period. Lungs sound were normally heard in control group.

Table-02 Physical signs and symptoms

Symptomatology	Control Group	Study Group		%
Mucous Membrane	Pink	Pale	28	82.35
		Pink	06	17.64
General Body Condition	++++	+	24	70.58
		++	09	26.47
		+++	01	02.94
		++++	00	00.00
Body Coat	Shinning	Staring	22	64.70
		Staring	12	35.29
Cough	ND	Present	04	11.76
		ND	30	88.23
Appetite	Normal	Normal	14	41.17
		Loss of Appetite	20	58.82
Conjunctiva	Pink	Pale	28	82.35
		Pink	06	17.64
Daily Temperature	Normal	Normal		-----
Nasal Discharge	Absent	Present	20	58.82
		Absent	14	41.17
Lymph Nodes	Normal	Normal	30	88.23
		Enlarged	04	11.76
Auscultation of the Chest	NAD	NAD	25	73.52
		DR/RL/LL	06	17.64
		MR/RL	03	08.82

Abbreviations

+ = Poor general condition   ND=Not detected
MR= Moist rales
++ = Fair general condition   NAD= Nothing abnormal
RL= Right lung   detected
+++= Good general condition   Dr=Dry   rales
LL= left lungs

RESULT AND DISCUSSION
Prevalence of bovine tuberculosis
The incidence of bovine tuberculosis among cattle and buffaloes has been summarized in table 01 and figure 01 . Clinical observation of cattle and buffaloes has been observed from all the four studied zones (East, West , North and South). The most frequent parasite detected was *Mycobacterium bovis* with 6.02 percent tuberculosis infection in cattle and 13.33 percent In buffaloes..Joshi *et.al* (2012) noticed 6.4 % prevalence in buffaloes .The incidence of bovine tuberculosis (7.09 percent) was higher in case of indigenous animals as compare to exotic and crossbred animals (6 percent). Most of the

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