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Review Article

Abattoir And Bovine Tuberculosis as A Reemerging Foodborne Disease

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Abstract

Abattoir is the place in which the animals are slaughtered for human consumption. Abattoir plays important role in prevention of zoonotic diseases between animals and humans like Mycobacterium tuberculosis as reemerging foodborne disease and also prevent infectious diseases betwwen animals. Mycobacterium tuberculosis is caused by a species of pathogenic bacteria in the family Mycobacteriaceae . the causative agent bacteria of Bovine tuberculosis as reemerging foodborne disease tuberculosis bacteria have an unusual, waxy coating on its cell surface primarily due to the presence of mycolic acid. This coating makes the cells impervious to Gram staining, and as a result, the causative agent bacteria of Bovine tuberculosis as reemerging foodborne disease can appear weakly Gram-positive. Acid-fast stains such as Ziehl–Neelsen stain, or fluorescent stains such as auramine are used instead to identify the causative agent of Bovine tuberculosis as reemerging foodborne disease with a microscope. The causative agent bacteria of Bovine tuberculosis as reemerging foodborne disease are highly aerobic and requires high levels of oxygen. Primarily a pathogen of the mammalian respiratory system, it infects the lungs. The most frequently used diagnostic methods for Bovine tuberculosis as reemerging foodborne disease are the tuberculin skin examination , acid-fast stain, culture, and polymerase chain reaction.

Keywords: abattoir; cattle; mycobacterium tuberculosis; reemerging; foodborne disease

Introduction

Bovine tuberculosis as reemerging foodborne disease is still one of the largely neglected foodborne zoonotic diseases in the world, particularly in developing countries (1,2,3 and 4). Bovine tuberculosis as reemerging foodborne disease occurrence would be still important in many places. Thus, this zoonosis deserves further research and efforts to establish the real burden of disease in cattle, role of abattoirs as well in humans. Developing strategies of interaction between academia and health care public sectors, including medical and veterinary disciplines, would generate more accurate data (5,5,7 and 8). Even more, as human tuberculosis due to Bovine tuberculosis as reemerging foodborne disease is still a public health concern internationally, in developing countries where detection is usually not depend on molecular and specific diagnostic methods, in addition to microscopy investigation for acid-fast bacilli bacteria in biological samples as well as culture, Bovine tuberculosis bacteria would be causing many of M. tuberculosis-attributed human disease, particularly in the case of outside lung forms of disease, even more in rural areas where both diseases can overlap and where human–cattle contact as consumption of raw milk and dairy products contaminated with Bovine tuberculosis bacteria would be considerable(9,10 and 11) . Control programs and human tuberculosis control programs, especially in those places, should consider the importance of Bovine tuberculosis and begin to introduce operational research into their activities as well surveillance to control and prevent disease from this bacteria (12,13,14 and 15).

Methods of identification and Diagnosis of Bovine Tuberculosis as a reemerging foodborne disease (16,17, 19,20 and 21)

Bovine Tuberculosis clinical signs are not specifically distinctive and, therefore, do not enable veterinarians to make a definitive diagnosis based on clinical signs alone.

The tuberculin skin examination is the standard mean of Tuberculosis diagnosis in live cattle. It consists of injecting bovine tuberculin (a purified protein extract originated from M. bovis) intra-dermally and then measuring skin thickness at the site of injection 72 hours later to detect any subsequent swelling at the injection site.

Blood-based in vitro examinations that detect bacteria, antibodies, or cell-mediated immunity are also currently available, or under development. The

most common used blood-based examination is a gamma interferon release assay which detects a cell-mediated immune response to infection with M. bovis. This examination is based on the principle that bovine blood cells that have previously been exposed to M. bovis through an infection are known to produce elevated levels of gamma interferon following in vitro incubation with M. bovis antigens.

The definitive diagnosis means is confirmed by bacterial culture and identification in the laboratory, a process that can take eight weeks or more. The recommended examination methods, including the procedures for manufacturing and administering bovine tuberculin.

Nature of Bovine tuberculosis as reemerging foodborne disease. Bovine tuberculosis as reemerging foodborne disease is a chronic bacterial disease of cattle caused by members of the Mycobacterium tuberculosis complex primarily by Bovine tuberculosis, but also by M. caprae and to a lesser extent M. tuberculosis (22,23,24,25 and 26). It is a major infectious disease among cattle, and also affects other domesticated cattle and certain wildlife populations, causing a general state of illness, pneumonia, weight loss, and eventual death (27,28,29,30 and 31). The name Bovine tuberculosis as a reemerging foodborne disease comes from the nodules, called 'tubercles', which form in the lymph nodes and other affected tissues of affected cattle (32,33,34 and 35).

Cattle are considered to be the major reservoir Bovine tuberculosis as a reemerging foodborne disease, and are the main source of infection for humans. Nevertheless, the disease has been reported in many other domesticated and non-domesticated animals (36,37,38 and 39).

Geographical distribution of Bovine tuberculosis as reemerging foodborne disease. Bovine tuberculosis as reemerging foodborne disease is found throughout the world (40,41,42 and 43), but some countries have never detected tuberculosis, and many developed countries have reduced or eliminated bovine tuberculosis from their cattle population and kept the disease limited to certain areas (44,45,46,47 and 48). However, significant zones of infection remain in wildlife. The highest prevalence of bovine tuberculosis is in Africa and parts of Asia, the disease is also affecting countries in Europe and the Americas (49,50,51,52,53,54,55, and 56).

The most prominent Clinical signs of Bovine tuberculosis as a reemerging foodborne disease in cattle, Bovine tuberculosis as reemerging foodborne disease may be sub-acute or chronic, with a variable rate of progression (57,58,59,60,61 and 62). A small number of cattle may become severely affected within a few months of infection, while others may take several years to develop symptoms. Bovine tuberculosis bacteria can also lie dormant in the host without causing symptoms for a long time (63,64,65,66,67, and 68). The usual symptoms of Bovine tuberculosis as a reemerging foodborne disease in man include Weakness, loss of appetite and weight, fluctuating fever, dyspnoea and cough, signs of low-grade pneumonia, diarrhea, enlarged, enlargement lymph nodes (69,70,71 and 72).

Discussion:

Mycobacterium bovis has been isolated from domestic animals as cattle, buffalo, sheep, goats, equines, camels, deer, antelopes, dogs, cats, and animals (73, 74, 75 and 76).

Bovine tuberculosis as reemerging foodborne disease is an infectious disease (77,78,79,80,81,82,83 and 84).

Most cases of human tuberculosis are caused by the bacterial species, Mycobacterium tuberculosis. Bovine tuberculosis as reemerging foodborne disease is a form of tuberculosis in human predominantly caused by a closely related species, Bovine tuberculosis, which belongs to the M. tuberculosis complex (85,86,87,88 and 89).

Transmission and spread of Bovine tuberculosis as reemerging foodborne disease. The disease is contagious and can be transmitted directly by contact with infected domestic and non-domesticated animals or indirectly by oral route (90,91,92,93 and 94).

The usual route of infection within cattle herds is by inhalation of infected aerosol, which are expelled from the lungs. Calves can be infected by ingesting colostrum or milk from infected cows (95,96,97,98,99,100 and 101).Humans can become infected by ingesting raw milk from infected cows, or through contact with infected tissues at abattoirs or butcheries (102 and 103). The course of disease is slow and takes months or years to reach the fatal stage. An infected animal can shed the bacteria within the herd before the clinical signs. Movement of subclinical infected domestic cattle is a main route of spreading the disease (104, 105 and 106).

Detection of Bovine tuberculosis as reemerging foodborne disease, Bovine tuberculosis as reemerging foodborne disease clinical signs are not specifically distinctive and, therefore, do not enable veterinarians to make a definitive Detection based on clinical signs alone(107 and 108).

The tuberculin skin examination is the standard method for tuberculosis Detection in live domestic cattle (109, 110,111 and 112).

Blood-based in vitro examinations that detect bacteria, antibodies, or cell-mediated immunity are also currently available, or under development (113,114,115,116,117,118 and119). The most widely used blood-based examination is a gamma interferon release assay which detects a cell-mediated immune response to infection with Bovine tuberculosis (1 and 120. This examination is based on the principle that bovine blood cells that have previously been exposed to Bovine tuberculosis through an infection are known to produce elevated levels of gamma interferon following in vitro incubation with Bovine tuberculosis antigens (2 and 3) .

The definitive Detection is confirmed by bacterial culture and identification in the laboratory (77 and 78).

The recommended detection methods of Bovine tuberculosis as reemerging foodborne disease, including the procedures for manufacturing and administering bovine tuberculin (84 and 85).

Public health risk of Bovine tuberculosis as reemerging foodborne disease. The most common form of tuberculosis in man is caused by M. tuberculosis bacteria (89 and 90). However, it is not possible to clinically differentiate infections caused by M. tuberculosis bacteria from those caused by Bovine tuberculosis, which is estimated to account for up to 10% of human tuberculosis cases in some countries (77 and 93). Detection of Bovine tuberculosis as reemerging foodborne disease may be further complicated by the tendency of Bovine tuberculosis infections to be located in tissues other than the lungs and the fact that Bovine tuberculosis bacteria is naturally resistant to one of the antimicrobials that is commonly used to treat human tuberculosis(23 and 24).

The technical standards and recommendations that are intended to manage the human and animal health risks associated with infection of cattle with a member of the Mycobacterium tuberculosis complex, including Bovine tuberculosis (29 and 30).

Role of abattoir in eradication of Bovine tuberculosis as a reemerging foodborne disease. Human tuberculosis is a major cause of illness and mortality worldwide (117,118 and119). It is primarily caused by Bovine tuberculosis as reemerging foodborne disease and is usually transmitted through the respiratory route by close contact and inhalation of aerosols of infected persons (35, and 36). Bovine tuberculosis as a reemerging foodborne disease is a less common form of human tuberculosis that is caused by a related member of the Mycobacterium tuberculosis complex (Bovine tuberculosis) (41, and 42). Bovine tuberculosis as a reemerging foodborne disease is primarily transmitted indirectly, through the consumption of contaminated milk, dairy products, or meat containing infected material (116,115 and114). In regions where food hygiene is consistently applied, the risk to the general public has been reduced (113,112 and111); however Bovine tuberculosis as a reemerging foodborne disease

infection remains an occupational hazard to food of animal origin eaters workers, abattoir workers, and butchers (43,44,45,46,47 and 48). Bovine tuberculosis as a reemerging foodborne disease is depend up on a One Health approach recognizing the interdependence of human and animal health sectors for addressing the main health and economic effects of this disease (110,109,108,107,49,50,51,52,53 and 54). Effective action from government agencies, donors, academia, non-governmental units and private stakeholders through different methods as political, financial and investigation methods (56,57,58,59 and 60). Defining the priorities for control Bovine tuberculosis as a reemerging foodborne disease in man and bovine tuberculosis in cattle (66,67 and 68). By Improving the scientific evidence base, reduce transmission between cattle and humans, Supporting the cooperation between sectors, Prevention and control of Bovine tuberculosis as reemerging foodborne disease (100,101,102 and103). The National control and eradication system based on examination and slaughter of infected cattle at abattoir under hygienic precautions is successfully used to control and eradicate Bovine tuberculosis as a reemerging foodborne disease (74 and 75). This method remains inapplicable in some heavily infected countries because it could necessitate slaughtering large numbers of cattle, and this may not be suitable, due to human resources are limited (16,17 and 18). So, most of countries apply varying forms of examination and segregation in early state, and then switch to examine-and-slaughter methods in the final stage (78,79 and 80). Several disease eradication system have been very successful in control or eradicate the Bovine tuberculosis as reemerging foodborne disease in cattle, by employing a multi-faceted approach that includes, post mortem meat inspection at abattoir, for detection of infected cattle and herds for Bovine tuberculosis as reemerging foodborne disease , intensive surveillance including on-farm visits, systematic individual examination of cattle, removal of infected and in-contact cattle, adequate local legislation, effective movement controls, individual animal identification, and effective traceability (16,17,18 and 19).Detecting infected cattle in abattoirs prevents unsafe meat from entering the food chain and allows Veterinary Services to trace-back to the herd of origin of the infected animal which can then be examined and eliminated if needed (9,8,7,6 and 5).

Pasteurisation or heat treatment of cow's milk to a temperature sufficient to kill the bacteria has proven effective for preventing the spread of disease to humans (24,25,26 and 27).

Antimicrobial treatment of infected cattle is rarely attempted because of the doses and duration of treatment that would be required, high cost of medications, and interference with the primary goal of eliminating the disease, and potential risk of developing resistance (28,29,30,31,32,33 and 34).

Conclusion:

Vaccination is practiced in human medicine, but it is, so far, not used as a preventive measure in cattle, due to the lack of availability of safe and effective method of vaccination, and potential interference with bovine tuberculosis surveillance and examinations, due to false reactions in vaccinated cattle. Researchers and studies are actively investigating potential new or improved bovine tuberculosis kinds of vaccines and alternate routes of vaccine delivery for use in cattle and wildlife reservoirs, as well as new examinations to reliably differentiate vaccinated cattle from infected cattle.

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