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Treatment of bovine actinomycosis in crossbred cow: A case report

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Abstract

Bovine actinomycosis (Lumpy Jaw) is a chronic infectious and contagious disease affected the cattle. A crossbred Holstein Frisian cow with the history of off feed and unilateral swelling at mandibular region was presented for treatment. The swelling was increased day by day. The animal had a hard painless, diffused swelling at mandibular region. Based on symptoms it was confirmed actinomycosis. The animal was treated with broad spectrum antibiotics and non steroidal anti-inflammatory drugs for seven days. The animal responded to the treatment of broad spectrum antibiotics and nonsteroidal anti-inflammatory drugs and recovered symptomatically.

Keywords: Actinomycosis, crossbred cow, infectious disease

Introduction

Actinomycosis (lumpy jaw) in cattle is a chronic infectious disease characterized by suppurative granulation of the skull, particularly the mandible and maxilla. There are gross painful swellings; abscesses, fistulous tracts and extensive fibrosis that all contribute to the granulomatous lesion (Radostits *et al.*, 2007) [12]. Bovine Actinomycosis is a non-contagious, chronic to sub-acute infectious inflammatory progressive pyogranulomatous osteomyelitis of the bony tissues of the head region. In case of Lumpy jaw supportive abscesses are more frequently seen in the mandible, maxillae, teeth alveolus or other bony tissues in the head. The disease is caused by *Actinomyces bovis* in cattle and *Actinomyces israelii* in humans. The disease is characterized by presence of pus in the mandibular or maxillary region or the affected sinuses containing sulfur granules having bacterial clumps (Hyland, V.C. *et al.*, 1993) [7]. The disease is also called as "lumpy jaw" in cattle and was first time described by LeBlanc in 1826 (Joyce, T.M., 1938) [8]. The disease has an effect on all age groups, breeds, and sex of cattle. *Actinomyces* spp are normal flora of the gastrointestinal tract of ruminants and they gain entrance into tissues of oral mucosa through abrasions and penetrating wounds caused by wires or nails or coarse hay or sticks or thorns. It is important to note that *Actinomyces bovis* bacteria is of zoonotic importance and has got human health significance (A rare zoonosis) as it causes skin lesions, abscesses, bronchopneumonia, granulomas in humans. The sternum, ribs, and the spinal column is also affected in humans (Ruhrah J VIII. 1899) [13]. Three cases of Pelvic Actinomycosis have been also reported from Taiwan over the past 40 years. Pathological signs include inflammation of the fallopian tubes, ovaries and pyometra (Hsu C.T. *et al.*, 1988) [5]. *Actinomyces bovis* is a gram-positive, anaerobic, filamentous, non-motile, non-spore forming, non-capsulated, non-haemolytic, non-acid fast pleomorphic rods to coccobacilli bacteria, many of which are filamentous or branching associated with 'Actinomycosis/Lumpy Jaw' in cattle. Actinomycosis has been recorded from various parts of India (Choudhary, S.S., 2016) [2]. The incidence of disease in cattle is higher as they are mainly fed with rough hay or ensilage. These type of feeds injure the buccal mucosa and thereby predispose them to this infection. Then the organism is introduced to underlying soft tissues via penetrating wounds of the oral mucosa caused by straw or wires or thorns in the grasses. Farooq *et al.* (2010) described a typical case of bovine actinomycosis in a seven-month pregnant heifer with a hard swelling on the middle of the maxilla bone at the level of the central molar teeth. Tentative diagnosis was made through clinical signs. In this study, diagnosis of the disease depended on the presence of a small, hard, yellowish granules "sulfur granules" or "rosettes," which observed as tiny grains in the pus from abscesses of all examined cases. After crushing of the washed granules on a glass slide and staining with gram stain, Gram-positive micro-organisms were seen either as short rods, filaments, or branching forms (club-like rosettes).

Neutrophilic leukocytosis detected during hematological examinations almost due to the bacterial infection. Results of biochemical analysis (hyperprotenemia and hypergammaglobulinemia) may indicate chronic inflammatory process. Diagnosis in Bovine actinomycosis can be done on the basis of history and clinical signs but the demonstration of gram-positive rods in yellowish sulfur granules from aspirated purulent discharges as well as bacteriological culture and histopathology are confirmatory. The organism appears gram positive long filamentous rods to coccobacilli in exudate from active lesions.

Case history and observation

A cross bred Holstein Frisian cow was presented in Bargur Cattle Research Station, Bargur with a history of off feed and unilateral swelling at mandibular region. The cow was eight months pregnant. The swelling has increased day by day. The animal had a hard, painless, diffused swelling at the mandibular region. Clinical examination of the animal revealed the involvement of mandible region and hard growth noticed in mandibular (Figure 1). The important parameters like rectal temperature, pulse, and respiratory rates were 103.2. 0°F, 80 beats/min and 25 breaths/min respectively.



Fig 1: Mandibular Swelling before Treatment



Fig 2: Mandible after Treatment

Treatment and Discussion

The cow was treated with broad-spectrum antibiotic and non-steroidal anti-inflammatory drugs for seven days. Injection of

Penicillin and Streptomycin at the rate of 10 mg/kg body weight (Dicrystin-S) daily along with injection of Meloxicam @0.2 mg/kg body weight (Melonex) and Chlorpheniramine maleate (Anistamin) for five days. *Actinomyces bovis* bacteria are sensitive to Penicillin, Streptomycin, Bacitracin, oxytetracycline and Cloxacilin. Dicrystin- DS has also recorded sensitive. Isoniazid has been successfully used in the treatment of actinomycosis in cattle as it arrested the growth of actinomycotic lesions. Treatment of Bovine Actinomycosis with Streptomycin and Potassium Iodide at the rate of 6-10 gm/day orally for 7-10 days (Radostits *et al.*, 2000) have also been found effective. Oral administration of Potassium Iodide in combination with Penicillin and Streptomycin or Oxytetracycline has also been found effective in treatment of actinomycosis in cows (Pal *et al.*, 1994 and Hussain 2006) [1]. Penicillin is the drug of choice for all clinical forms of actinomycosis in humans (Dwivedi. G. *et al.*, 2018) [4]. This case was responded well for parental antibiotic treatment and symptomatically recovered.

Conclusion

Bovine Actinomycosis or lumpy jaw is a non-contagious disease causes significant economic losses in dairy animals. It leads to weakness of the affected animal, decrease in the productive life of an animal and poor response to the daily clinical treatment as a result of late recovery by the animal. Abrasions or wounds in the oral cavity, caused by dry and coarse feeds fed to the animal are believed to be the primary cause of entry of organism into the animal. To prevent the occurrence of this disease, animals should be fed with smooth and water soaked straws to avoid damage to the buccal mucosa. Affected animals should be isolated in the initial stage of the disease. Also, the affected animals should not be allowed to graze in pastures along with healthy cattle to prevent the contamination of grass, water, bedding and utensils by the animals. This will also help in prevention of infection to other healthy animals. In conclusion, surgical intervention, through the removal of pus from the affected area along with washing with normal saline solution followed by flushing with 2% povidone iodine solution and parenteral administration of broad-spectrum antibiotic (Penicillin and Streptomycin) and non-steroidal anti-inflammatory intramuscularly with oral administration of Potassium Iodide for five days is an effective method for the treatment of bovine actinomycosis in field conditions.

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