International Journal of Livestock Research, Vol. 11 (2) Feb' 2021
http://www.ijlr.org
eISSN: 2277-1964
NAAS Rating 2020 – 5.36

Case Report

Incidence of Generalized Tetanus in an Adult Holstein – Friesian Cow and Non-Descript Buffalo

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How to cite this paper: Saravanan, S., & Vijaya Kumar, G. (2021). Incidence of Generalized Tetanus in an Adult Holstein -Friesian Cow and Non-Descript Buffalo. *International Journal of Livestock Research*, 11(2), 185-189. http://dx.doi.org/10.5455/ijlr.20201004063050

Received : Sep 30, 2020
Accepted : Jan 06, 2021
Published : Feb 28, 2021

Abstract

An adult Holstein-Friesian cow and an adult non-descript buffalo were presented with the signs like saw horse posture, locked jaw, prolapsed third eyelid, erect ears, stiffness of limbs, bloat, dyspnoea and lateral recumbency. The cow had the history of recent calving and the buffalo had decay of incisor teeth. Generalized (descending) tetanus was diagnosed in both the cases which were treated with parenteral administration of procaine penicillin, muscle relaxant and intravenous fluids, however succumbed to the disease within few days of treatment.

Keywords: Buffalo, Generalized Tetanus, Holstein-Friesian Cow, Puerperal, Tooth Decay

Introduction

Tetanus is a highly fatal disease of all species of domestic animals caused by neurotoxin of *Clostridium tetani* and characterized by a general increase in muscle stiffness, tremors, lockjaw and prolapse of third eyelid (Gupta *et al*., 2018). The spores gain entry through the wounds which could be inflicted by managemental procedures *viz*., castration, dehorning, tattooing, hoof trimming, docking, surgical procedures, injection of drugs/ vaccines, parturition/ dystocia (Upadhyay *et al*., 2013). Cattle are the least susceptible species to tetanus and cases are mostly sporadic in cattle. However, the case–fatality rate is said to be over 80% in young ruminants, where as the recovery rate is reported to be high in adult cattle (Constable *et al*., 2017).

Previously, localized tetanus has been reported in adult cattle but occurrence of generalized (descending) tetanus in adult cattle and buffalo are rarely reported due to innate resistance. Hence, this study reports the occurrence of generalized tetanus in an adult Holstein –Friesian cow and an adult non -descript buffalo with its therapeutic management.

Case History and Observations

A Holstein-Friesian cow and a buffalo of 4 and 5 years old, respectively, were presented to Teaching Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal with the history of inappetence, salivation, stiffness of limbs, bloat, dyschezia, dysuria and lateral recumbency since 2 days. Clinical examination of the HF cow revealed salivation, dyspnoea, spastic paralysis of all limbs, thoracic and abdominal muscles, erect ears and tail, trismus (lock jaw), prolapsed third eyelid, retraction of eyelids, opisthotonus, arched back, bloated appearance, saw horse posture, hyperaesthesia, alert expression, rise in body temperature (39.5ºC) and sunken eyeball indicating dehydration (Fig. 1, 2, 3). The clinical examination of the buffalo revealed lock jaw, prolapsed third eyelid, retracted eyelids, opisthotonus, stiffness of thoracic muscles and both hind limbs, erect tail, hyperaesthesia, respiratory distress and sunken eyeball (Fig. 4 and 5).

Figure 1: Holstein-Friesian cow showing stiffness of all four limbs, bloat and saw horse posture

Figure 2: Holstein-Friesian cow showing bloat and arched back with rigidness of lumbar muscles

Figure 3: Holstein-Friesian cow showing prolapse of third eyelid, retraction of eyelids, erect ears, lock jaw and opisthotonus

Figure 4: A non-descript buffalo showing lock jaw, opisthotonus, stiffness of hindlimbs and erect tail

Figure 5: A non-descript buffalo showing prolapsed third eyelid and sunken eyeball

Result and Discussion

In HF cow, the history of dystocia followed by manual removal of placenta 10 days back led to infection by the tetanus bacilli in the genital tract, resulting in generalized puerperal tetanus. In the buffalo, decay of an incisor tooth favoured necrosis in the deep root canal, predisposed to the onset of generalized tetanus. Castration and parturition are reported to be the common predisposing factors in cattle (Phil Scott, 2010 and Constable *et al*., 2017). Previously Gupta *et al.* (2018) recorded localized tetanus in an adult cross bred jersey cow predisposed by parturition, and Saravanan and Palanivel (2019) recorded localized tetanus in an adult jersey cow which was predisposed by wound associated with actinomycosis. Previously, tetanus was reported in young buffalo calves with successful recovery (Arvind Kumar Das *et al*., 2011 and Yousaf *et al*., 2016), generalized tetanus in Hereford cattle calves and buffalo calves with 100 per cent case-fatality (Driemeier *et al.,* 2007 and Upadhyay *et al.,* 2013).

The clinical signs observed in the present cases are in agreement with that of the previous reports (O'Connor *et al*., 1993, Smith 2002, Yousaf *et al*., 2016, Arsala Khan *et al*., 2016; Nuri *et al.,* 2017). In generalized (descending) tetanus, high amount of neurotoxins enter into the blood and lymphatic vessels, reach the Peripheral (PNS) and Central Nerves System (CNS) by retrograde movement in axons where they block the release of inhibitory neurotransmitter (acetyl choline) causing spastic paralysis in all groups of muscles (Montecucco and Schiavo, 1995). Since no satisfactory ante-mortem tests are available for confirmation of tetanus in the absence of obvious wounds, the disease has to be diagnosed on the basis of definitive clinical signs *viz*., history of injury, muscular spasms and prolapse of third eyelid (Radostits *et al.,* 2007).

In this study, the cases were treated with procaine penicillin @ 40,000 IU/kg, IM, diazepam as an anticonvulsant @ 0.5 mg/ kg bwt, IV, 5% dextrose normal saline, IV and flunixin meglumine as an antipyretic @ 2 mg/kg bwt (Upadhyay *et al*., 2013 and Constable *et al*., 2017). However, both cases succumbed to the disease within 1-2 days of treatment because of the respiratory and cardiac failure associated with spastic paralysis (Constable *et al*., 2017). Administration of tetanus antitoxins (TAT) is generally recommended only during the initial stage of clinical signs as TAT could neutralize only free toxins unbound to nerves (Schaer and Gaschen, 2016). After onset of nervous signs, this therapy is of little value since the binding of the neurotoxin (tetanospasmin) to nerves is irreversible and the TAT is unable to penetrate the blood brain barrier (BBB) (Constable *et al*., 2017).

Prognosis in generalized form of tetanus is unfavourable in livestock and most of the cases succumb to the disease during the course of treatment itself because of prolonged therapy involved. Hence, adequate care should be taken to prevent the onset of tetanus by adopting necessary precautions like administration of tetanus toxoids before parturition, timely management of inflicted wound avoiding sepsis and administration of tetanus antitoxins in early stage of tetanus.

Acknowledgement

The authors are grateful to the Dean of Veterinary College and Research Institute, Namakkal, Tamil Nadu, India for providing necessary support and facilities to carry out this research work.

Conflict of Interests

There is no conflict of interest.

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