

## Therapeutic Management of Tetanus in a Mare

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### Abstract

A mare was presented with history of anorexia, stiffness, hyperesthesia and unable to open mouth since last three days. The clinical examination revealed high temperature, elevated heart rate, pulse rate, twitching of muscles and stiffness of legs with spread to the entire body. The affected mare was unable to eat and drink due to lock jaw condition. The affected mare also showed prolapse of third eyelids and dilated nostrils. Diagnosis was made based on co-relation of history, clinical findings and Gram's staining of impression smear revealed typical gram-positive rods of *Clostridium tetani* which appeared like drum stick and hematological examination revealed leukocytosis with neutrophilia. The animal was treated with anti-tetanus serum, long-acting Penicillin, Flunixin meglumine, sedative, muscle relaxant, antihistaminic, multivitamins and fluid therapy. The affected mare showed complete clinical recovery after eight days of therapy.

**Keywords:** Immunoglobulin; mare; tetanus

### Introduction

Tetanus is caused by *Clostridium tetani* in mammals. Horses are highly sensitive to tetanus among all mammals. The *Clostridium tetani* a Gram-positive bacterium form spores which are present in the soil for many years. The incubation period of tetanus is varied from 3-28 days. (Green *et al.*, 1994). The clinical signs recorded as spasm of the head lead to trismus and lock jaw (Beroza, 1980). In the earlier stage touching of eyeball can cause prolapse of third eyelid, which then return slowly to its natural resisting position (Radostits *et al.*, 2007) but later on protrusion of third eyelid could be permanent (Green *et al.*, 1994). Spasm involves neck and esophagus which leads to dysphagia (Brook, 1970). The ears had been erected and immobile along with elevated tail head. In severe conditions, the horse adopts a saw horse posture with serious dyspnea, neck stiffness and severe sweating before getting recumbent (Johnston, 1987). The movement of animal become difficult or almost impossible because of signs of general

infection syndrome and spasm of extremity develop concurrently (Radostits *et al.*, 2007). Death may result due to spasm of respiratory muscles (Johnston, 1987). The present paper records diagnosis and successful therapeutic management of tetanus in a mare.

### History and Clinical Observations

A 3.5 years old mare was presented with history of anorexia, stiffness and hyperesthesia and unable to open mouth since last three days. The mare was injured with sharp iron object at left side of the neck for seven days. The owner also complaint about inflammation and deep punctured wound around the neck region.

The clinical examination of the mare revealed high temperature (104<sup>o</sup>F), elevated heart rate, pulse rate, twitching of muscles and stiffness of legs with spread to the entire body. Neck and head were extended to backward with twisting of the neck. The affected mare was unable to eat and drink due to lock jaw's condition. Saliva was drooling out from the mouth. All four legs were extended and both the ears and tail were erect due to stiffness and the animal was adopted a 'sawhorse' or 'wooden horse' posture (Fig. 1). The affected mare also showed permanent protrusion or prolapse of third eyelids (Fig. 2) and dilated nostrils.

### Diagnosis and Treatment

The case was diagnosed as tetanus based on correlation of history, clinical findings and Gram's

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Fig. 1: Saw horse or Wooden horse posture



Fig. 2: Protrusion or prolapse of third eyelid



Fig. 3: Corrected protrusion of third eyelid after 5<sup>th</sup> day of therapy



Fig. 4: Complete recovery from third eyelid protrusion after 8<sup>th</sup> days of therapy

staining of impression smear revealed typical Gram-positive rods of *Clostridium tetani* which appeared like drum stick and hematological examination revealed leukocytosis with neutrophilia.

The mare was kept in dark to avoid hyperesthesia and given anti-tetanus serum (Tetglob<sup>a</sup>) at 9000 IU, intravenous in normal saline for the first 2 days of treatment. The affected mare was treated with long-acting penicillin G at 22000 IU/kg b.wt., intramuscular injection Flunixin meglumine (Unizif<sup>b</sup>) at 1.1 mg/kg b.wt. intravenous; injection Triflupromazine at 2.2 mg/kg b.wt. intramuscular; injection B<sub>1</sub>, B<sub>6</sub>, B<sub>12</sub> (Tribivet<sup>b</sup>) at 0.5 mg/kg b.wt., intramuscular; injection Chlorpheniramine maleate at 0.5 mg/kg b.wt., intramuscular and Dextrose normal saline (5 percent), 5 liters, intravenous, once daily for eight days. The deep punctured wound was aseptically cleaned with 2 percent Hydrogen peroxide followed by antiseptic dressing with Betadine<sup>c</sup>. 200 IU of anti-tetanus serum was also infiltrated around punctured wound to

a - Brand of Bharat Serum and Vaccine Ltd., Pune

b - Brand of Intas Animal Health, Ahmedabad

c - Brand of Win Medicare Pvt. Ltd., New Delhi

neutralize unbound toxin and prevent further absorption.

### Results and Discussion

The affected mare showed slight improvement after second day of therapy, taking feed, water and improvement in protrusion or prolapse of third eyelid (Fig. 3) were observed after five days of therapy. The complete clinical recovery was observed after eight days of therapy (Fig. 4).

In the present case, *Clostridium tetani* got entry from punctured wound by foreign objects and such wound provides a suitable environment for the growth of *Clostridium tetani* and production of neurotoxin. The neurotoxin was responsible for neurological symptoms (Radostitis *et al.*, 2007). The organism proliferated and produced tetanospasmin and tetanolysin toxins during lowered local tissue oxygen tension. The clinical signs in the present study were similar to signs reported by Beroza (1980), Radostitis *et al.* (2007) and Bharai *et al.* (2019). The administration of tetanus immuno-globulin can neutralize the free form of powerful exotoxin produced by the bacterium present in circulation. However, anti-toxin does not cross the blood-brain barrier (Coetzer and Tustin, 2004). Penicillin is the drug of choice that helped in elimination of causative bacteria. Triflupromazine acts as mild sedative and relaxes intercostal muscles and diaphragm resulting in normal respiration. Flunixin meglumine was used as analgesic and anti-pyretic. Fluid therapy helped in survival of the mare as it was unable to take feed and water orally due to lock jaw condition and also helped in rehydration and neutralization of circulating toxins. A similar line of treatment was also reported by Bharai *et al.* (2019) for therapeutic management of tetanus in Marwari stallion.

In present study, it was concluded that administration of anti-tetanus serum, long-acting Penicillin, Flunixin meglumine, sedative, muscles relaxant, antihistaminic,

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multivitamins and fluid therapy successfully manage tetanus in a mare.

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### FAO organized Workshop on National Action Plan on AMR 2022-25



Delegate of AMR Workshop

India along with more than 100 other countries developed its National Action Plan (NAP) on Antimicrobial Resistance (AMR) in 2017 for a period of five years. This was a result of the recommendation of FAO, the World Organisation for One Health (OIE-WHO), and the UN General Assembly during 2015-2016. A review and revision of the Animal Health component of the NAP for possible incorporation in the next NAP (2022-2026) was undertaken in a consultative meeting

of national experts at New Delhi from 23-25 March, 2022. The consultation was attended by 50 experts representing the animal health, human health and environment sectors; the private sector; food safety and regulatory agencies and international development partners.

The national consultation was inaugurated by Dr Praveen Malik, then Animal Husbandry Commissioner, DAHDF, MoFAHD. Dr JK Jena, Deputy Director General (Fisheries), Indian Council for Agricultural Research (ICAR); Dr B.N. Tripathi, Deputy Director General (Animal Sciences), ICAR MoAFW; Dr Sujeet Kumar Singh, Director, National Centre for Disease Control and National Focal Point for AMR shared their thoughts on the way forward to contain AMR in India especially in the Animal Health sector.

A technical panel discussion on the collaboration and support from international development partners included United States Agency for International Development (USAID); Centers for Disease Control and Prevention of United States of America; the Fleming Fund; Bill and Melinda Gates Foundation (BMGF); and the International Livestock Research Institute. The agencies conveyed their willingness and support to India for the implementation of NAP (2022-2026). Dr Shrish Nigam and Dr Nitin Bhatia, representing Indian Federation of Animal Health Companies (INFAH) also actively participated in the workshop and shared the view of the industry and the antimicrobial usage data that the industry has collated and submitted to the department. The data suggests that antimicrobial usage is much below the mark considering the country's livestock population and its requirements.

The national experts were unanimous in their opinion that while the NAP (2017-2021) has created significant advocacy and awareness amongst various stakeholders, the next version of the NAP (2022-2026) must focus on implementation of proposed activities on a priority basis.