



ISSN: 2456-2912
VET 2024; 9(1): 311-313
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www.veterinarypaper.com
Received: 14-10-2023
Accepted: 20-11-2023

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Aspiration pneumonia in a Holstein Friesian crossbred cow: A case report

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DOI: <https://doi.org/10.22271/veterinary.2024.v9.i1e.934>

Abstract

Aspiration pneumonia is a lung disease characterized by inflammation and necrosis due to the inhalation of foreign material. A six-year-old Holstein Friesian crossbred cow was presented with history of anorexia, nasal discharge, hypersalivation, coughing, pyrexia and reduced milk yield following faulty drenching of liquid paraffin as the treatment for frothy bloat two days back. Clinical examination revealed high body temperature, mucus purulent nasal discharge, cough, tachycardia, tachypnoea, congested mucous membrane, putrid breath, extended head and neck with crepitation on palpation of neck and thoracic area. Thoracic auscultation revealed prominent and loud wheezing in antero-ventral aspect of the thorax. Haematology showed leukocytosis with neutrophils. The left lateral radiography of the thorax revealed alveolar and interstitial pattern. The animal recovered well, after parenteral treatment with ceftiofur sodium, flunixin meglumine, and nebulisation with ceftiofur sodium and levosalbutamol.

Keywords: Aspiration pneumonia, liquid paraffin, ceftiofur sodium, levosalbutamol

Introduction

Pulmonary aspiration in bovines is caused by inhalation of secretions, forestomach contents or foreign material into the larynx or lower respiratory tract (Scott, 2012) ^[1]. The presence of abnormal substances in the airways and alveoli as a result of inhalation is usually referred to as aspiration pneumonia (Smith, 2009) ^[2]. The severity of the inflammatory response and key signs depend on the type and volume of material aspirated and the distribution of aspirated material in the lungs (Poulsen, 2010) ^[3]. The resultant pulmonary disorder could be mechanical, chemical, infectious and/or a varying combination of the three. Aspiration of foreign substances into the lung may, or may not, involve bacterial infection. Aspiration pneumonia, however, is infectious in nature and is associated with an acute pulmonary response as a result of material that is colonised by pathogenic bacteria. Nebulization is one of the most effective treatment modalities in the drug delivery in the bovine respiratory disease.

Case history and observation

A six years old Holstein Friesian crossbred cow was presented to Large Animal Medicine Outpatient unit, Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal with the history of anorexia, hypersalivation and mucopurulent nasal discharge. The owner administered 500 ml of liquid paraffin orally to treat frothy bloat two days back. During administration of liquid paraffin, the animal was not properly restrained and had an aspiration due to faulty drenching. Coughing, open mouth breathing were developed. The animal was dull and depressed. There was respiratory distress with a severe tachypnoea. Auscultation of thorax revealed prominent and loud wheezing in antero-ventral aspect of the thorax. Congested conjunctival mucous membranes, putrid breath, elevated temperature (40 °C) and heart rate (116 /min) were observed. It also had ptyalism with open mouth breathing, extended head and neck (Fig.1). The palpation of the neck and cranial ventral thorax revealed crepitation. Voiding of pelleted dung and reduced urine output were noticed. Elevated total white blood cell count (20.74×10^3 / dL) and absolute neutrophil count (15.51×10^3 /dL) were the significant haematological alteration.

The left lateral radiography of the thorax revealed pulmonary infiltrates with alveolar lung pattern in the cranioventral lung field.

Treatment and Discussion

A provisional diagnosis of aspiration pneumonia was made based on the history, clinical examinations, and haematological findings. The animal was treated with Inj. Ceftiofur sodium @ 1.1 mg/kg IM SID, Inj. Flunixin meglumine @ 1.1 mg/kg IM SID for 7 days and Inj. Furosemide @ 2 mg/kg IM BID for 3 days. Nebulisation was also given with Ceftiofur sodium @ 0.5 mg/kg and Levosalbutamol 1.25 mg (Levolin 2.5 ml respule) continuously for 7 days (Fig. 2). The animal showed clinical improvement on third day onwards. The rectal temperature reached to normal (38.5 °C) and cough and respiratory distress started to resolve slowly on fifth day onwards. After five days of treatment cow had good appetite and respiration was normal with slight coughing was observed. Decrease in TLC levels ($12 \times 10^3/\text{dL}$) and neutrophil count ($4 \times 10^3/\text{dL}$) were noticed on seventh day of treatment. The cow had recovered completely with no obvious clinical sign within seven days of treatment.

Aspiration or inhalation pneumonia is common in farm animals and caused by inhalation of ingesta, lipid, medications and excess dust. Improper or careless drenching medications for other illnesses by inexperienced persons was the most common cause of aspiratory pneumonia in cattle. Inappropriate administration leads to passage of liquid into lungs and liquid penetrates to the depth of alveoli and run freely into the dependent portions and aspiratory pneumonia often results (Constable *et al.*, 2017) [4]. Dhillon *et al.* (2020) [5] reported that many farmers use a large variety of liquid supplements or medication drenches to prevent or cure diseases. In the present study, the faulty drenching of liquid paraffin by the owner himself was reported. The pneumonia caused by aspiration of mineral oil (liquid paraffin) is called as lipid pneumonia. (Constable *et al.*, 2017) [4]. The clinical signs such as anorexia, salivation, mucopurulent nasal discharge, pyrexia, putrid breath, tachycardia, tachypnoea, coughing, open mouth breathing and expiratory grunt with extended head and neck observed in the present study was also reported by Venkatesakumar *et al.* (2015) [6] and Sasikala *et al.* (2021) [7] in cattle with bacterial pneumonia and aspiration pneumonia, respectively. Leukocytosis with neutrophilia following liquid paraffin aspiration in the present study might be due to inflammatory changes by secondary bacterial invasion into the affected portion of lung with compromised respiratory defence mechanism which was in concurrence with Venkatesakumar *et al.* (2020) [8]. Radiographic findings such as pulmonary infiltrates with alveolar lung pattern suggestive of aspiration in the present study was in consistent with Shakespeare (2012) [9]. Ceftiofur sodium very effective in the management of bacterial pneumonia in cattle (Venkatesakumar *et al.*, 2020) [8]. Treatment with broad spectrum antibiotics and anti-inflammatory drugs was effective in the management of aspiration pneumonia in cattle (Smith, 2009) [2]. Nebulization of ceftiofur sodium was the most effective treatment in calves with bovine respiratory disease (Joshi *et al.*, 2017) [10]. Dose for systemic antibiotics could be reduced, and maximum drug concentrations could be achieved in lungs with nebulization. In the present case, parenteral administration of ceftiofur sodium along with nebulization with ceftiofur sodium and levosalbutamol (Bronchodilator) was successful in the

management of aspiration pneumonia. Nature and quantity of material aspirated and early start of appropriate therapy would decide the recovery of the animals. Prognosis is poor in the cattle with aspiration pneumonia due to mineral or vegetable oils (Constable *et al.*, 2017) [4]. In the present study, even though aspiration pneumonia occurred with faulty drenching of liquid paraffin, the animal had a clinical recovery which might be due to early start of treatment and possibility of less quantity of liquid paraffin would have been aspirated into respiratory tract. Forcible drenching of medications by pulling tongue out, head held high, too faster than swallowing capacity of animals and animals with coughing or bellowing should be avoided.



Fig 1: Extended head and neck with open mouth breathing



Fig 2: Nebulisation (ceftiofur and levosalbutamol)

Conclusion

Aspiration pneumonia is very dangerous condition leading to death of the animals and occurs mainly due to faulty drenching of medications. Early start of treatment with broadspectrum antibiotic (Ceftiofur sodium), anti-inflammatory drug (flunixin meglumine) and nebulization with ceftiofur and levosalbutamol are important in the successful therapeutic management of cow with aspiration pneumonia. For prevention of aspiration pneumonia, proper

restraining of animals and careful administration of medications with narrow mouthed long neck bottle should be considered.

Acknowledgements

The authors are thankful to the Dean, Veterinary College and Research Institute, Namakkal, for the facilities provided to carry out the work

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