

Comparative antibiogram and clinical efficacy of ceftriaxone in bovine respiratory infections

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Bovine respiratory disease is the most common illness affecting housed cattle and is a major limiting factor in animal production (Healy et al., 1993). Studies on the microbial population of the respiratory tract of cattle including those suffering from respiratory tract infections have been studied in different countries. In India, Chakrabarti et al., (1978) have studied the microbial flora of the respiratory tract of cattle and buffaloes. Literature on the isolation of micro flora from the diseases of upper respiratory tract in cattle is scanty particularly the rural areas under field conditions. This study was planned to isolate the microbial flora of the upper respiratory tract of cattle with respiratory infections and the *in vitro* sensitivity test with antibiotics to formulate an effective treatment procedure under field conditions.

Forty-eight dairy cattle presented with a history of coughing, nasal discharge, partial anorexia to the TVCC Tamilnadu over a period of six months were included in the study. After preliminary clinical examination, special examination of the respiratory system was carried out as per the standard procedure. Nasal swabs were taken from the ailing animal with the help of long sterilized swabs. The organisms were isolated and identified on the basis of cultural and biochemical tests. The *in vitro* antibiotic sensitivity tests of all the isolated organisms were carried out by the disc diffusion technique (Bauer et al., 1969). Out of the 48 animals, 20 animals were selected for the treatment study. The animals were given intramuscular injection of ceftriaxone @ 10 mg/Kg/ BWt along with meloxicam @ 0.5 mg/kg.BWt, a non-steroidal anti-inflammatory drug for three days.

The affected animal did not show any appreciable changes in the pulse rate but had an increased respiratory rate (42/minute). The rectal temperature ranged between 101⁰ F to 103^{0.8} F. The nasal passage was congested and contained mucoid to mucopurulent

discharge. The findings of the study concurred with the previous study (Chakrabarti et al., loc. it.). Auscultation of the lung area revealed exaggerated breathing sounds suggestive of respiratory involvement.

The main bacterial etiology for respiratory infections in this study was Staphylococcus Sp. (33.33%) followed by Streptococcus Sp. (29.17%), E.coli (14.58%), Klebsiella Sp., (14.58%) and Pseudomonas Sp., (8.33%) respectively. The antibiogram revealed higher sensitivity to ceftriaxone (91.17) and amikacin (91.17%) followed by ciprofloxacin (81.25%) gentamicin (79.17%), neomycin (79.92%), tetracycline (68.75%) and chloramphenicol (66.67%). Amoxycillin and sulpham were relatively resistant to most of the bacterial isolates. This might be due to the indiscriminate use of these two agents or variation in the strains involved.

Treatment of bovine respiratory disease involves specific anti-microbial therapy as well as treatment aimed at alleviating symptoms and enhancing respiratory exchange mechanisms. Thus, non-inflammatory drugs are frequently administered concurrently with anti-microbials for symptomatic improvement in the treatment of bovine respiratory disease (Clarke et al., 1991). In the treatment study, treatment with ceftriaxone and meloxicam was initiated on day one itself without waiting for the result of antibiotic sensitivity test. Twelve animals in the treatment group with ceftriaxone along with anti-inflammatory were completely recovered from respiratory infection within three days of treatment and there was no recurrence of the disease. The improvement in the clinical condition was assessed based on the disappearance of the clinical symptoms and a negative result in the cultural examination. Most of the respiratory signs and the pyrexia subsided during the course of treatment and the animal's demeanor and feed intake improved.

Ceftriaxone, a third generation cephalosporins is one of the most active cephasporins, having longer half-lives, which allows them to be administered once

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or twice daily depending on the routes of administration. Meloxicam is a cyclooxygenase inhibitor that has anti-inflammatory, analgesics and anti-pyretic properties. The acute inflammatory component of pneumonia results in impaired gas exchange and the aim of modulating pulmonary inflammation by the use of NSAIDs are to block the production and/or the effects of inflammatory mediators and modulators which have a deleterious effect on alveolar exchange of gas (Lekeux and Van De Weerd, 1996). In addition, NSAIDs acts as analgesics to improve the general status of animals and increase the food and water intake. It can be concluded combination of an antibiotic - ceftriaxone along with an anti-inflammatory drug meloxicam is highly efficacious in the treatment of bovine respiratory infections in cattle.

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References

- Bauer, A.W., Kirby, W.M.M., Sherris, J.G., Tenckhoff, M. 1969. Antibiotic susceptibility testing by a standardized single disc method. *Am. J. Clin. Pathol.* **46**: 495.
- Chakrabarti, A., Dash, P.K., Kar, B.C., and Misra, S.K. 1978. Microbial flora of the upper respiratory tract in bovines and their in vitro sensitivity test with certain antiseptics and antibiotics. *Indian Vet. J.* **55**: 435.
- Clarke, C.R., Barrows, G.E. and Ames, T.R. 1991. Therapy of bovine bacterial pneumonia In: *The Veterinary Clinics of North America, Food Animal Practice*, **7**: 669-694.
- Healy, A.M., Monaghan, M.L., Bassett, H.F., Gunn, H.M., Markey, B.K. and Collins, J.D. 1993. Morbidity and mortality in a large Irish feedlot: microbiological and serological findings in cattle with acute respiratory disease. *British Vet. J.* **149**: 549.
- Lekeux, P. and Van De Weerd, M.Z. 1996. Use of anti-inflammatory drugs in the treatment of bovine respiratory disease complex. Proceedings of an International Symposium held in conjunction with XIX World Buiatric Congress, Edinburg, Scotland, July.

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