

APPLICATION OF TRANS TRACHEAL WASH IN DIAGNOSIS AND THERAPEUTIC MANAGEMENT OF CHRONIC PNEUMONIA IN BUFFALO

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SUMMARY

A 4-year-old buffalo exhibited the signs of respiratory distress, nasal discharge, severe coughing for more than 1 month. Clinical and physical examination revealed polypnea, mucoid nasal discharge, crackles on auscultation of lungs. Radiographic study showed unstructural interstitial pattern in caudal lung lobes indicating generalized pulmonary inflammation. Trans-tracheal aspirate was collected for cytology that showed presence of inflammatory cells with clusters of ciliated and squamous epithelial cells besides presence of numerous rods and coccobacilli. The cultural isolation of aspirate confirmed the presence of *Staphylococci*, *Pseudomonas* and *E.coli*. The antimicrobial susceptibility against the isolated organisms showed highest sensitive for amikacin which was selected for therapy @10 mg/kg body weight I/M bid for 5 days. The adopted therapy along with other supportive medications brought clinical recovery with remission of clinical signs.

Keyword: Amikacin, Buffalo, Pneumonia, Trans-tracheal wash, Treatment

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Bovine Respiratory Diseases (BRD) are economically important bovine disease causing substantial morbidity and mortality in unattended cases (USDA, 2013). Multiple risk factors like stressors (environment, transportation, overcrowding), host immunity along with bacterial and viral pathogens contribute in the development of disease (McGill and Sacco, 2020). BRD are primarily characterized by anorexia, respiratory distress, fever, coughing, nasal discharge of different consistencies and abnormal lung sounds (Buczinski *et al.*, 2014). The management of BRD remains challenging owing to multi-factorial etiology, treatment failure (Booker and Lubbers, 2020) and lack of gold standard diagnostic tests (White and Renter, 2009).

A 4-year-old Murrah buffalo (2nd parity and 5 months pregnant) was presented at Veterinary Clinical Complex, Lala Lajpat Rai University of Veterinary and Animal Sciences (LUVAS), Hisar with history of anorexia, fever, nasal discharge, respiratory distress, severe coughing, reduced milk yield and treatment failure for more than 1 month. Animal was subjected for detailed clinical examination, haemato-biochemical examination, radiography and for transtracheal wash to confirm the respiratory disease.

On clinical examination, animal have emaciated condition, normal body temperature (101° F), tachypnea (38/min), normal heart rate (62 beats/min), mucoid nasal discharge, coughing and on auscultation of the lungs crackles sound was heard. Hemato-biochemical

examination (Hb= 11.3 g/dl, PCV= 30%, TLC = 11.43×10^3 , neutrophils=71%, lymphocytes =27%, monocytes= 2%, total protein= 5.28 g/dl, phosphorous= 5-5.7 mg/dl) from jugular vein blood showed relative neutrophilia which might be due to bacterial infection, hypoalbuminemia (1.60 g/dl), hypocalcemia (5.7 mg/dl) might be due to low feed intake since one month and increased activity of AST enzyme (187 I.U.) which could be attributed to hepatic injury. Thoracic radiography revealed unstructural interstitial pattern (Fig. 1) in caudal lung lobes indicating staining of vascular structures and bronchiolar walls by infiltration of cells or fluid suggesting the generalized pulmonary inflammation which could be due to bronchopneumonia, pulmonary fibrosis or diffuse pulmonary metastasis (Rozear *et al.*, 1998).

Similar to Angen *et al.* (2009), trans-tracheal wash was performed by using a male dog urinary catheter along with 12 G needle to puncture the space in between two tracheal rings at mid-tracheal area. Cytological analysis of trans-tracheal wash revealed varying amounts of erythrocytes, cellular reaction with presence of degenerated and intact neutrophils, macrophages, lymphocytes. Single or small clusters of ciliated epithelial cells, squamous epithelial cells and numerous rods and coccobacilli (in chains) were also evident in the sections (Figs. 2 and 3).

Staphylococci spp., *Pseudomonas* spp. and *E.coli* bacteria were detected on culture examination and twenty antimicrobial discs *viz.* enrofloxacin, cephalexin, penicillin G, carbenicillin, streptomycin, amoxicillin, tobramycin,

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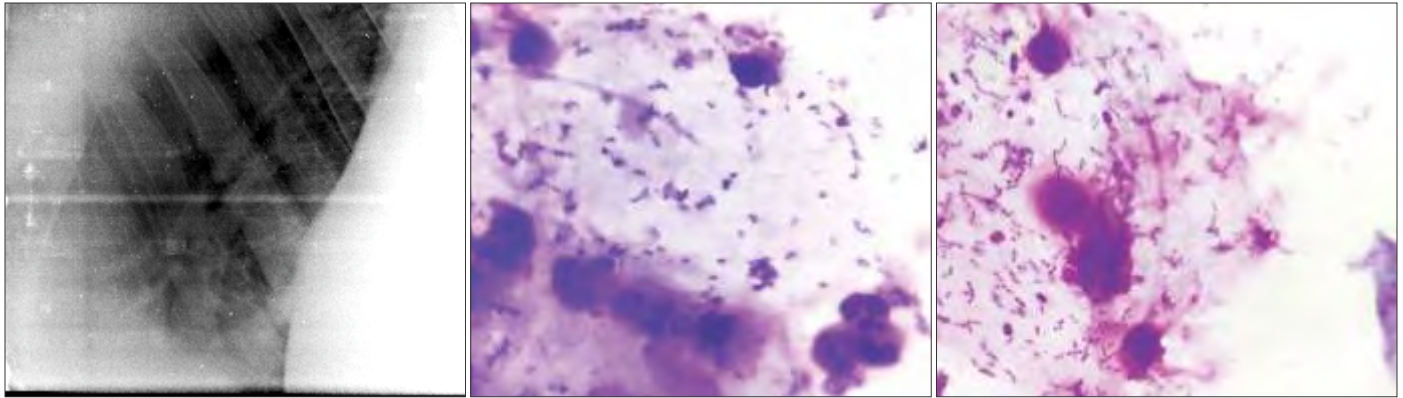


Fig. 1-3. (1) Thoracic radiography indicating unstructural interstitial pattern; (2) Cytological evaluation of TTW showing cellular reaction with presence of degenerated and intact neutrophils, macrophages, lymphocytes along with bacteria; (3) Cytological smears of TTW showing presence of degenerated and intact neutrophils along with numerous rods and coccobacilli (in chains)

ciprofloxacin, oxytetracycline, norfloxacin, chloramphenicol, ceftriaxone, moxifloxacin, levofloxacin, ampicillin, gentamicin, neomycin, amikacin, cefquinome, ceftiofur and cefoperazone were used for antibiotic sensitivity test by Kirby beurer method (Bauer *et al.*, 1966). Among these, only amikacin and gentamicin antimicrobials were found sensitive for detected pathogens.

Treatment was started with Enrofloxacin @5 mg. per kg bwt on day of presentation but after 2 days, on the basis of culture sensitivity, Amikacin sulphate (Akyci® injection) @10 mg/kg b.wt b.i.d. was initiated along with supportive therapy viz. isoflupredone @ 8 ml, vitamin C (Sona C)@7 g total dose I/M, 10 ml pheniramine maleate (Avil), oral electuary catcough 30 g b.i.d. and steam inhalation with levosalbutamol (0.63 mg) raspsules for 5 days. Telephonically, owner reported the complete recovery of animal after 5 days of treatment.

Misfiring use of 3-4 parentral broad spectrum antibiotics (ampicillin plus cloxacillin, ceftriaxone plus sulbactam and enrofloxacin) previously along with supportive therapy since 1 month put both direct and indirect impact on animal as well as on owner in accordance to Booker and Lubbers (2020). Tracheal wash and/or broncho-alveolar lavage are better diagnostic techniques than nasal or nasopharyngeal swabs to sample the respiratory diseases of cattle (Cooper and Brodersen, 2010).

In conclusion, the findings of this case report strongly support the use of transtracheal wash as a better diagnostic tool for sampling the bovine respiratory lower

tract diseases.

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