Multidrug resistant acute mastitis in a doe: A field report

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Abstract

A recently parturated doe was presented with off-fed, swollen udders and improper gait for the last three days. The present manuscript deals with clinical signs of mastitis in a doe and its therapeutic management. The doe was treated with tetracycline, gentamicin (locally), antihistamine and udder immunity enhancer/antioxidants after clinical evaluation and anamnesis. The animal recovered uneventfully after five days of combined and adjunct therapy.

Key words: Antioxidant, Doe, Mastitis, Udder

Mastitis, a multifactorial disease and caused by multiple etiological agents, is the inflammatory syndrome of the udder, and is the clinical manifestation of intramammary infection (Zadoks *et al.*, 2011). During the peri-parturient and post-parturient phases, mastitis occurs primarily and is typically associated with the intensive dairy farming system. Mastitis has been recorded under various agro-climatic conditions in various species of lactating animals including goats (Rani *et al.*, 2008). Mastitis in Black Bengal goats has been observed in West Bengal along with other clinical disorders such as metritis (Biswas and Biswas, 2015). The present communication deals with the therapeutic and clinical management of acute mastitis in a doe.

A four-year-old doe was presented at Additional Block Animal Health Centre, Bhagwangola-I, Murshidabad with a history of off-fed with swollen udders affecting both quarters of the udder (Fig. 1). The kids were unable to suck any milk and the doe parturated 20 days before the onset of the symptoms. On clinical examination, the doe had moderate to high rectal temperature (104°F) with fatigue and mild dehydration. With zero let down of milk by hand stripping/milking, the hardness and solidification of the udder were observed at palpation. The California Mastitis Test (CMT) showed thick color-changing gel formation

and scored ++++ which indicated clinical mastitis.

Teat siphons in both teats were introduced following adequate sanitary steps (Fig. 2). More than 1.8 litres of clotted and foul-smelled milk from both teats were drained out over a period of more than 20 minutes. A sample of 5 mL of milk was collected in a sterile test tube during the process and sent to the Eastern Regional Station, IVRI for the Antibiotic Sensitivity Test (ABST). It was suspected that an appropriate quantity of milk was retained in the udder upon palpation. Injection oxytocin (Syntocinon, 10 IU/mL; Mylan Products Ltd., United Kingdom, 2 mL through I/V route SOS) was given to explore the scope of draining the retained milk from the udders keeping in view the patient's clinical situation. The process of draining out of milk from the udders began after 3-5 minutes again and more than 1.05 L was drained out over a period of another 18 minutes. Upon palpation, udders were found to be empty, and then the udders were scrubbed and washed with detergent water to remove all forms of dirt externally. Udders were then shaved to remove hair in some places. Udder surfaces were again washed with detergent water after shaving and further sterilized with povidone-iodine solution (Betadine; 10% W/V; Win-Medicare, India). After taking all sanitary and hygienic measures, antibiotic inj. gentamicin (Genticyn, 40 mg/mL; Abbot India Ltd. @ 10 mg/kg body weight)

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Mastitis in doe

Fig. 1. Goat with mastitis (before treatment)

Fig. 2. Teat Siphon introduced to drain out milk

Fig. 3. ABST showing zones of inhibition

Fig. 4. Twelve hours after initial treatment

and Inj. isoflupredone acetate (Inerol; Intas Pharmaceuticals Pvt. Ltd., India @ 0.2 mg/kg body weight) diluted aseptically in 4 mL sterile distilled water respectively in two different injection syringes. Then these diluted medicines were injected into 3 different sites on each udder. This process was repeated for another two days along with inj. oxytetracycline (Terramycin; 50 mg/mL; Pfizer India Pvt. Ltd, @ 10 mg/kg body weight twice daily I/V for five days) along with 200 mL of I/V normal saline, inj. chlorpheniramine maleate (Anistamin; 10 mg/mL; Intas Pharmaceuticals Pvt. Ltd., @ 1mg/kg body weight once daily through I/M for five days), mammary immunity enhancer (Mami Up Bolus; Virbac Animal Health Pvt. Ltd., one bolus orally daily for five days). The treatment seemed to respond (Fig. 4) and the owner was also advised for five days to continue hand milking twice a day along with hot stimulation of magnesium sulphate. After five days of clinical management, the animal recovered uneventfully and the kids were able to suckle the doe milk.

The resistance pattern of the bacteria was determined using the agar disk diffusion method according to the standards of the Clinical and Laboratory Standards Institute (CLSI, 2020). The findings of ABST (Fig. 3) showed that bacterial agents were sensitive to tetracycline (TE) and gentamicin (GN), and resistant to ampicillin (AMP), amoxicillin (AMX) and cefaclor (CF). Similar resistance profiles were reported from university veterinary hospital, Hyderabad, India (Priya and Ayodha, 2016), Pakistan (Ali *et al.*, 2010) and Brazil (Da Silva *et al.*, 2004). The current study found that bacteria have become more resistant to the penicillin group of antibiotics, which is likely due to the long-term and widespread use of the penicillin group of antibiotics in the treatment of mastitis (Mahlangu *et al.*, 2018).

REFERENCES

- Ali Z, Muhammad G, Ahmad T, Khan R, Naz S *et al.*, 2010. Prevalence of caprine sub-clinical mastitis, its etiological agents and their sensitivity to antibiotics in indigenous breeds of Kohat. Pak J Life Soc Sci, 8(1): 63-67
- Biswas P and Biswas S, 2015. Therapeutic management of metritis-mastitis in a goat. Intas Polivet, 16: 117-118
- Clinical and Laboratory Standards Institute, 2020. Performance Standards for Antimicrobial
- Parental and local routes were used for tetracycline and gentamicin, respectively. This combination is rarely utilized for mastitis treatment in small ruminants in the field. In addition, the care of the doe showed that good results and recovery from mastitis can be achieved with the proper dose and route of medication along with supportive therapy i.e., mammary gland immunity enhancer. This immunity enhancer contains some specific blend of fat-soluble vitamins and pH lowering salts which exerts an antioxidant effect on mammary gland epithelium (Cabezuelo *et al.*, 2020). The samples could not be processed for bacterial identification and characterization due to time limitations. But it is expected to be a mixed acute bacterial infection based on the ABST result (Radostits *et al.*, 2007).
- Acute mastitis is an important clinical manifestation in small ruminants such as goats and needs prompt evaluation with specific therapeutic treatment. In this specific case study, the combined antibiotic was adequate to remove the suspected mixed bacterial infection at the necessary dosage and route of adjunct therapy. This study also demonstrates that systemic and local antibiotic therapy along with udder immunity enhancer can be an important treatment measure for goats in field conditions in the case of acute mastitis.

Conflict of interest: Authors have no conflict of interest in this study.

ACKNOWLEDGEMENT

The authors are extremely grateful to Animal Resource Development Department, Govt. of West Bengal for providing the necessary support and facilities to complete the study.

- Susceptibility Testing, 30th edn. Thirtieth Informational Supplement M100-ED30, Available at: [http://em100.edaptivedocs.net/GetDoc.aspx?doc=CLSI%20M100%20ED30:2020&sbssok=CLSI%20M100%20ED30:2020%20\[NEXT\]](http://em100.edaptivedocs.net/GetDoc.aspx?doc=CLSI%20M100%20ED30:2020&sbssok=CLSI%20M100%20ED30:2020%20[NEXT]) (accessed on 5th September 2020)
- Cabezuelo TM, Zaragoza R, Barber T and Viña JR, 2020. Role of vitamin A in mammary gland development and lactation. *Nutrients*, 12(1): 80, doi: 10.3390/nu12010080
- Da Silva ER, Siqueira AP, Martins JCD, Ferreira WPB and Da Silva N, 2004. Identification and *in vitro* antimicrobial susceptibility of *Staphylococcus* species isolated from goat mastitis in the Northeast of Brazil. *Small Ruminant Res*, 55(1-3): 45-49
- Mahlangu P, Maina N, and Kagira J, 2018. Prevalence, risk factors, and antibiogram of bacteria isolated from milk of goats with subclinical mastitis in Thika East Subcounty, Kenya. *J Vet Med*, 2018: Article ID 3801479, doi: 10.1155/2018/3801479
- Priya S and Ayodha S, 2016. Bacterial and antibiogram studies of milk samples of clinical mastitis in goats. *IOSR J Agric Vet Sci*, 9(6): 33-35
- Radostits OM, Gay CC, Hinchcliff KW and Constable PD, 2007. *Veterinary Medicine: A Textbook of the Diseases of Cattle, Horses, Sheep, Pigs and Goats*, 10th edn., WB Saunders Co. Ltd, Philadelphia, pp 673-762
- Rani NL, Srimivas M, Suresh K and Sreenu M, 2008. An epidemiological study of mastitis in buffaloes. *Indian Vet J*, 85: 1350-1351
- Zadoks RN, Middleton JR, McDougall S, Katholm J and Schukken YH, 2011. Molecular epidemiology of mastitis pathogens of dairy cattle and comparative relevance to humans. *J Mammary Gland Biol Neoplasia*, 16: 357-372, doi: 10.1007/s10911-011-9236-y