



Gangrenous Mastitis In Ewes: Report of two cases in Al Muthanna veterinary hospital/ Al Muthanna governorate/ Iraq

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Abstract

Recently, there is an increasing in the raising of

small ruminants in order to meet the high demands for ewe's milk and milk products globally. However, gangrenous mastitis is one of the most difficult problem to be encountered. This study intends to describe the clinical and laboratory investigations of two gangrenous mastitis cases in local Iraqi ewes and to discuss the treatment plan. The routine physical examination of the udder revealed an obvious traditional clinical signs of gangrenous mastitis on both ewes especially skin discoloration and coldness of the affected quarters. *Staphylococcus aureus* and *Mannheimia haemolytica* were isolated from the udders secretions. The author recommends to do the earlier routine therapeutic management with prompt surgical removal of the affected quarter. Moreover, furthers studies are needed to be done on ovine gangrenous mastitis to understand its epidemiological aspects in order to implement the suitable prevention and control program.

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Introduction

Mastitis is one of the most important disease affecting dairy animals industry including ewes. It is a common health problem in lactating animals and has a major impact concerning both economy and animal welfare because it is the common cause of culling of the dairy animals and retarded growth of the lambs. The disease commonly persuading inflammation and destructed the alveolar epithelium lead to complete or partial permanent impairment (Islam *et al.*, 2008). Mastitis is divided into subclinical and clinical mastitis groups. Clinical mastitis reveals itself with noticeable signs of infection with abnormal milk, and may or may not be related with systemic signs depending on the severity of the infection and it divides to four categories:

peracute, acute, subacute and chronic (Laura and Whatford, 2016). Subclinical mastitis is adversely affected the production, although milk constitutes indications in regards the level of somatic cell (SCC), California Mastitis tests (CMT) and bacteriological culture, are not as clearly recognized as for dairy cows(Laura Green and Whatford 2016). Ovine mastitis is reported globally including Iraq with variable prevalence rate such as 13 to 50 % and 1 to 3% in Britain and America respectively. The massive majority of organisms responsible for ovine mastitis are bacteria, however other causes include viral infection, such as *Maedi Visna* as mastitis is the important symptoms(Tormod *et al.*, 2007). “Blue bag” or gangrenous mastitis is a severe clinical conditions of the inflammatory process in the udder. It is the most difficult types of mastitis to be managed(Ribeiro *et al.*, 2007; ;Bloway,1993;Yeshwantkumar, 2008). Its clinical signs commonly occur in the first weeks of lactation, affecting one or two sides of the glands and are distinguished by fever, anorexia dyspnea and systemic signs of toxemia. The gangrene develops in the mammary gland due to mammary vessels thrombosis that created by virulent microorganisms toxin and lead to infarction and gangrene and ewe may die (Ribeiro *et al.*, 2007; Yeshwantkumar, 2008; Vautor *et al.*, 2009; Tufani *et al.*, 2010). The onset of the disease is very acute might be within few hours, and the skin of the udder is often bluish/ purple in color indicating that the udder blood supply is damaged from bacterial toxins. The secretions from udder suffered from gangrenous mastitis, is commonly scarce, and blood-tinged serum. An extensive range of microorganisms cause mastitis in ewes, nonetheless most cases are described to be due to *staphylococci* infection(Bergonier, 2003). *Mannheimia haemolytica* is considered as the major bacteria usually responsible for gangrenous mastitis in ewes, whereas *Staphylococcus aureus*, *Actinomyces pyogenes* are frequently found as secondary invaders (Tufani *et al.*, 2010). Besides, the previous studies revealed that *M haemolytica* was the predominant bacteria that could be isolated from gangrenous mastitis in ewes(Al-Ani *et al.*, 1997). Ovine mastitis in Iraq is underestimated in compare to bovine mastitis. Review of literature concerning ovine gangrenous mastitis in Iraq revealed scarce publications. Therefore, the present study describes the clinical, bacteriological and treatment of two gangrenous mastitis cases in local Iraqi ewes presented to AL Muthanna Veterinary hospital/ Al Muthanna province/ Iraq.

Case History and investigations

A 4 and 3 years old years’ ewes, weighing 28 kg and 26 kg respectively were presented to AL Muthanna Veterinary Hospital/ AL Muthanna governorate/ Iraq, with a history of recent lambing and a clinical signs of anorexia, lameness and recumbence. Both ewes were suffered from sudden drop in milk production and draining of watery milk tinged with blood from the affected quarter. The first ewe presented in recumbent position and the following observations were seen during clinical examination: elevation in body temperature (41.2- ° C), pulsation (110/min) and respiratory rate (120/min), severely congested conjunctival mucous membrane and engorgement blood vessel. The examination of the udder revealed that the left quarter was markedly swelled and cold accompanied with a dark reddish discolor indurated area that was surrounded with a clear circle line of crack. The teat secretion was gave blood tinged

milk that was collected aseptically in sterile vials and sent for laboratory examination (Figure. 1). Systematic and local treatments were used for treatment. Primarily, the ewe was treated with 3 ml Penicillin- streptomycin intramuscularly along with intramammary infusion of Penicillin. A 500 ml of fluid therapy was also infused intravenously (Dextrose anhydrous, Sodium chloride, potassium chloride and Calcium chloride). However, there was no improvement and the ewe was died.

The clinical examination of the second ewe shown a slight increase in body temperature (40.0- ° C) with elevation in pulse (100/min.) and respiratory (100/min) rates. The conjunctival mucous membrane was slightly congested. Udder examination revealed a swelling in the left quarter, which was cold to touch with bluish discoloration of skin (Figure.2). Milking of affected teat showed scanty blood tinged milk that was collected in sterile vials and sent for laboratory investigation. The ewe was treated with 2.5 ml Penicillin- streptomycin intramuscularly along with intramammary infusion of Penicillin. A 250 ml of fluid therapy was also infused intravenously (Dextrose anhydrous, Sodium chloride, potassium chloride and Calcium chloride) for 3 days. An obvious improvement was seen on this ewe after one week.



Figure. 1: Shows the severe gangrenous mastitis in case. 1. Discoloration and cracking of the affected skin.

Figure.2: Shows the udder of the case. 2 with a swelling of the affected quarter.

Laboratory investigations

Milk samples from both cases were sent in sterile vials to the clinical pathology laboratory/ College of veterinary medicine/ Al Muthanna University. The samples were cultured onto 10 % sheep blood agar, nutrient agar, MacConkey and Eosin Methylene Blue agar and incubated aerobically at 37 ° C for 24 hrs. The isolated colonies were again plated onto nutrient agar plates as pure culture and subjected to standard morphological, biochemical tests as described by (Cowan and Steel, 1993) to determine their identity. Three isolates were identified as two *Staphylococcus aureus* isolates (Figure. 3) and one as *Mannheimia haemolytica* (Figure.4). Bacteria within the family *Pasteurellaceae* were identified to the species level by the CAMP

reaction, the indole, mannitol, sorbitol, trehalose, dulcitol, oxidase and beta-galactosidase tests and the haemolysis patterns.

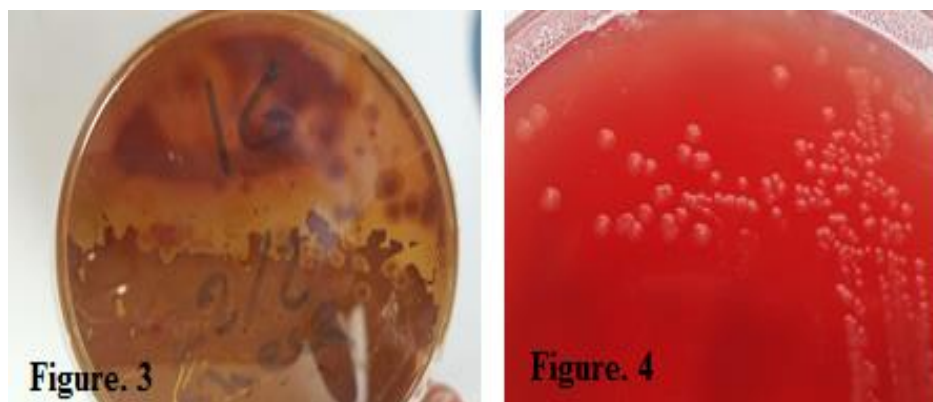


Figure.3: Shows the beta hemolysis of *staphylococcus aureus* colonies on sheep blood agar.

Figure. 4: Shows the colonies of *Mannheimia haemolytica* on sheep blood agar.

Discussion

Ovine gangrenous mastitis is a per-acute form of mastitis. It is established by severe acute inflammation, with conventional signs of redness, swelling, pain, and temperature. Due to the effect of bacterial toxins, the inflammation courses are processed to necrosis and gangrene (Lafi *et al.*, 1998). Gangrenous mastitis is an endemic problem in sheep flocks, it is hardly treated and controlled and a rapidly detection of the causative agents is needed to determine the appropriate treatment and control measurements. In the current study, 2 ewes were presented to clinic and during physical examination of the udder, an obvious traditional clinical signs of gangrenous mastitis were appeared on both ewes especially discoloration and coldness of the skin of the affected quarters. All these findings are compatible with observations reported previously by other researcher (Ribeiro *et al.*, 2007; Tufani *et al.*, 2010). In this study, the extensive treatment procedures was successful only with case. 2. Although treatment trials was made for case. 1, the ewe was died that reflect the animal was in advanced stage of toxemia. This observation is agreed with other researcher (Canle *et al.*, 2004). Canle *et al.*, (2004) mentioned that “the extensive therapeutic measure alone is not effective for treatment of gangrenous mastitis without prompt surgical removal of the affected quarter is undertaken, which is the only standard treatment for gangrenous mastitis in ewes”(Canle *et al.*, 2004). In the present study, both *Staphylococcus aureus* & *Mannheimia haemolytica* and *Staphylococcus aureus* alone were isolated from case. 1 and case. 2 respectively. *Staphylococcus aureus* has been reported to be the most causative agent of clinical mastitis with a percentage 29-65% of isolated bacteria, while the percentages of *coagulase negative staphylococci* (CNS), *E.coli*, and *Mannheimia haemolytica* were 3-19% , 3-19% and 1.5-4.3% respectively (Osman & Faruk, 2012). In the current study, *Staphylococcus aureus* was also isolated from both cases and found to be the most frequent isolated species in compare to *Mannheimia haemolytica* that was only isolated from case.1. This result is in

agreement with those reported previously (Al-Ani *et al.*, 1997; Lafi *et al.*, 1998; Osman & Faruk, 2012). *Mannheimia haemolytica* is the main bacteria frequently responsible for gangrenous mastitis in ewes, whereas *Staphylococcus aureus*, *Actinomyces pyogenes* are often found as secondary invaders (Tufani *et al.*, 2010). Moreover, researcher were found that the introduction of few as 10 colony forming units of *Mannheimia haemolytica* isolated from ovine nasal cavities of health lambs, produces clinical cases that similar to naturally occurring gangrenous mastitis (Laura Green and Whatford 2016; Al-Ani *et al.*, 1997). The isolation of *Mannheimia haemolytica* from case. 1 in the present study might strongly indicated that the origin of udder infection with *Mannheimia haemolytica* was from the nose and throats of nursing lambs.

In conclusion, this study described two cases of ewes with per acute gangrenous mastitis. Both *Staphylococcus aureus* & *Mannheimia haemolytica* were isolated. Earlier routine therapeutic management are needed for treatment and recommends with prompt surgical removal of the affected quarter.

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