Diagnostic and therapeutic management of clinical mastitis in a cow

Jupaka Shashank, G Abhinav Kumar Reddy and K Ramesh

Abstract

4-year aged cow is presented to the Veterinary Clinical Complex (VCC), College of Veterinary Science, Rajendranagar, Hyderabad with a history of off-feed, depressed, and swollen mammary glands from 4 days, and decreased milk yield. By Physical examination and palpation of the animal, noticed symptoms like pain on swollen udder, flakes during milking, milk is turned into yellowish brown colour, and animal body temperature is increased up to 104°F. Finally diagnosed as mastitis by all these symptoms, cultural examination and antibiotic sensitivity test, and given treatment for 5 days continuously. Seen complete recovery from mastitis with in a 5 days of treatment.

Keywords: Cow, mastitis, Hyderabad

1. Introduction

Mastitis is one of the most important economical diseases of dairy cattle (Bramley AJ, 1992) [1]. Generally, the clinical form of mastitis divided into mild, moderate or severe. In mild cases, visible abnormality is limited to the milk only i.e. clots, flakes or watery milk. Of course, one has to look to see such changes. If cows are not fore-stripped before the milking unit is attached, mild clinical mastitis will go unnoticed. In the case of moderate clinical mastitis, both milk and udder show abnormalities. In severe cases milk, udder, and cow are affected (Ganguly S, 2014) [2]. The animal may have a fever, off-feed, depressed and down. Severe clinical mastitis is often called acute mastitis. Generally, the mastitis is produced by a variety of gram positive and negative bacterial species and is characterized by inflammation of parenchyma of the mammary gland with physical, chemical and bacteriological changes in the milk and pathological changes in the granular tissues (Radostits et al., 2007) [3]. It is also defined as inflammation of mammary gland or udder tissue parenchyma which is caused by bacteria and its toxins (Sharma et al., 2006) [4]. The bacterial contamination of milk from affected cows render it unfit for human consumption and provide a mechanism of spread of diseases like tuberculosis, sore-throat, Q-fever, brucellosis, leptospirosis etc. and has zoonotic importance (Sharif et al., 2009) [5]. Usually there are two ways to classify the cases of mastitis. Contiguous and Environmental. Contiguous pathogens are spread cow-to-cow, typically during milking as infected mammary glands serve as the primary reservoir for such microbes. Contiguous pathogens include Staphylococcus aureus, Streptococcus agalactiae, and Mycoplasma Spp. (Gallin et al., 1992) [6]. Environmental pathogens are those which primarily reside in the cow’s normal habitat. Cows are primarily exposed to these pathogens between milkings when teat ends come in contact with contaminated bedding, manure, contaminated water, or soil. Common environmental pathogens include Escherichia coli, Klebsiella spp., and environmental streptococci such as Streptococcus uberis and Streptococcus dysgalactiae (Smith et al., 1985) [7]. There are many other microorganisms that have been isolated from cases of mastitis and are associated with the cow’s environment.

2. Material and Methods

The present investigation was carried out in the diagnostic laboratory, Department of Veterinary Clinical Complex, and Department of Veterinary Microbiology, College of Veterinary Science, Rajendranagar, Hyderabad. The owner of the animal brought with a history of inappetence and pyrexia and swollen mammary glands from 4 days and decreased milk yield. For detailed examination, milk is collected from animal aseptically in sterile conditions in a tray with black background, identified milk flakes (Fig. 1).
Apart from knowing of pH, the milk is collected and pH strips are placed in the milk sample and observed (Fig. 2). Done cultural examination with Mannitol salt agar. MSA has high salt condition where only *Staphylococcus aureus* can survive (Fig. 3). Done gram staining for identifying of bacterial organisms especially staphylococcus organisms (Fig. 4). Done Antibiotic sensitivity test and apart from this, Antibiotic discs like Streptomycin (S10), Ampicillin (AMP10), Ofloxacin (OF2), Ceftriaxone (CTR), Enrofloxacin (EX5), Ciprofloxacin (CIP5) are placed on Muller Hinton Agar (MHA) plates with definite distance and incubate for 24hrs, and also Haematological parameters recorded from affected animal (Table.1).

3. Results
By history, clinical signs, consistency (flakes) and pH (7-8) of milk, interpreted the cattle is suff ering with mastitis. The result of antibiotic sensitivity test is more sensitive for Ceftriaxone. So given Inj. GARD PLUS – (Cefaperazone + Sulbactum)-1 gm for 5 days I/M, Inj. Flunixin meglumine-15 ml I/M, Inj. Avil-15 ml I/M, and Inj. INTAVITA (Vitamin A, D3, E) – 5 ml deep I/M, Inj. Toxol- 20 ml I/M for 5 days. Intra mammary infusion like Mammitel – (Cloxacillin sodium + Colistin sulphate), Oint: Uddocare, BID., and Oral Nutrition like Mammidium powder @50 gms daily P/O for 5days. For topical Wisprec spray is advised which is anti-inflammatory. Finally, animal has recovered from mastitis in 5 days of continuous treatment (Fig. 5).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Mastitis cow (Present case)</th>
<th>Normal values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin (g/dl)</td>
<td>10.2</td>
<td>8.0-15.0</td>
</tr>
<tr>
<td>PCV (%)</td>
<td>26</td>
<td>24-46</td>
</tr>
<tr>
<td>RBC (10⁶/µl)</td>
<td>6.2</td>
<td>5-10</td>
</tr>
<tr>
<td>PCV (%)</td>
<td>26</td>
<td>24-46</td>
</tr>
<tr>
<td>WBC (10³/µl)</td>
<td>8.5</td>
<td>4-6</td>
</tr>
<tr>
<td>Neutrophils (%)</td>
<td>64</td>
<td>50-55</td>
</tr>
<tr>
<td>Lymphocytes (%)</td>
<td>43</td>
<td>60-63</td>
</tr>
<tr>
<td>Monocytes (%)</td>
<td>2</td>
<td>1-3</td>
</tr>
<tr>
<td>Eosinophils (%)</td>
<td>3</td>
<td>0-1</td>
</tr>
</tbody>
</table>
4. Discussion

Mastitis in dairy cow is a highly prevalent infectious disease, causing considerable economic loss worldwide ([Halasa et al., 2007], (Rajala et al., 1999)) [8, 9]. Generally, mild mastitis can often disappear in a few days with no treatment or with massage and hand stripping of the quarter (Barkema et al., 1999) [10]. However, the bacteria may still be there. The main treatment of mastitis is commonly administered by intramammary infusion of an ointment or intramuscular or intravenous injection of antibiotics. Intramammary antibiotics should be the first-line treatment for cows with mild uncomplicated mastitis in a single quarter. Systemic antibiotics should be used when more than one quarter is affected, whenudder changes are marked or when the cow is obviously ill. Combination therapy, with both systemic and intramammary antibiotics, may increase bacteriological cure rates fast (Hillerton et al., 1995) [11]. In this case we used GARD PLUS (cefeperazone sodium and sulbactam sodium), it is a third-generation cephalosporin antibiotic and given prognosis good by using of this. Treatment with intramammary antibiotics remains the basis of most mastitis treatment (Sharma N, 2007) [12]. In this case we used mammitel intramammary infusion. Mastitis may result in changes in the milk, udder of cow or any combination. Fore milking is the best method of early mastitis detection - clots, flakes, and changes in colour or consistency can be seen when milk is stripped on a dark surface. In this case we given INTAVITA (Vitamin A, D3 and E), and Mammidium powder (Multi vitamin and mineral). Vitamin A and Zn affect the epithelial health, physical defence barriers of the udder, and alter the quality and quantity of keratin plug. Cu, Zn, Se, and vitamins A and E influence the phagocytic cells functions in cattle. The killing ability of immune cells is shown to be increased by nutritional supplementation with Vitamin E, which has consistently been shown to improve neutrophil function in dairy cows (Politis et al., 1996) [13]. The mammidium powder helps to recovery from mastitis and promotes udder good health (Sharif et al., 2009) [14].

5. Conclusion

The cow was negative for milk flakes at 3 days post treatment, coinciding with improved general clinical conditions, recovering from udder swelling and started milk yield. These results showed that intramammary infusion of mammitel associated with the antibiotic therapy is highly effective for treating multiple quarter mastitis. It is also essential to understand the risks, benefits and possible side effects of all therapies administered when creating a long-term treatment plan.

6. Acknowledgement

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7. References