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REVIEW PAPER

A Comprehensive Look at Udder Oedema in Dairy Goats

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ABSTRACT

Udder edema, or swelling of the udder, is a common condition affecting dairy goats worldwide. It can have significant impacts on milk production, animal welfare, and economic viability of dairy operations. Despite its prevalence, udder edema in goats is not as well studied or understood as in dairy goat. This review aims to provide a comprehensive overview of udder edema in dairy goats, including its causes, symptoms, diagnosis, and management strategies. The etiology of udder edema in goats is multifactorial, with factors such as genetics, nutrition, management practices, and environmental conditions playing a role. Clinical signs of udder edema may include swelling, pain, heat, and changes in milk composition. Diagnosis is typically based on clinical examination, although imaging techniques such as ultrasonography may be used for confirmation. Management of udder edema in dairy goats involves a combination of preventative measures and treatment strategies. These may include optimizing nutrition, ensuring proper milking practices, providing adequate housing and ventilation, and administering anti-inflammatory drugs if necessary. Additionally, alternative therapies such as herbal remedies and homeopathy have been explored, although their efficacy remains controversial. Overall, udder edema is a complex condition that requires a multifaceted approach to management. Further research is needed to better understand the underlying mechanisms of udder edema in goats and to develop more effective prevention and treatment strategies. By addressing this issue, dairy goat producers can improve animal health, milk quality, and the sustainability of their operations.

1. Introduction

Udder oedema is a common disorder in dairy goats in which there is excessive accumulation of the interstitial fluid in the extravascular spaces of the udder occur. It depends on the severity of the disorder, which may affect the entire udder and the fluid may spread to the surrounding tissues [1]. Udder edema, also known as mammary edema or swollen udder syndrome, is a common condition affecting dairy goats worldwide. It is characterized by an abnormal accumulation of fluid in the udder, leading to swelling and discomfort in affected animals. Udder edema can have significant implications for both animal welfare and milk production, making it a concern for dairy goat farmers and veterinarians [2]. The causes of udder edema in dairy goats are multifactorial and can vary depending on the individual animal and the management practices employed on the farm. One of the primary causes of udder edema is poor lymphatic drainage, which can be exacerbated by factors such as high dietary sodium intake, hormonal changes, and physical trauma to the udder [3]. Additionally, environmental factors such as hot weather and high humidity can contribute to the development of udder edema by increasing the risk of mastitis, a common bacterial infection of the udder [4].

The symptoms of udder edema in dairy goats can range from mild swelling and discomfort to more severe cases where the udder becomes extremely enlarged and painful [5]. In some cases, the skin over the udder may become stretched and shiny, and the affected animal may exhibit

signs of pain or reluctance to be milked [3]. Severe cases of udder edema can also lead to complications such as mastitis, which can further impact milk production and animal health [4, 5]. Preventing udder edema in dairy goats requires a multifaceted approach that addresses the underlying causes of the condition [1]. This may include implementing proper management practices such as maintaining a balanced diet, providing adequate bedding and shelter, and ensuring proper hygiene practices during milking [5, 6]. Additionally, regular monitoring of the udder health of dairy goats and prompt treatment of any underlying conditions can help prevent the development of udder edema [4, 6]. Treatment options for udder edema in dairy goats vary depending on the severity of the condition and may include dietary adjustments, massage therapy, and the use of diuretics to help reduce fluid buildup in the udder. In severe cases, veterinary intervention may be necessary to drain excess fluid from the udder and alleviate pain and discomfort in the affected animal [4, 5, 6, 7].

2. Causes and risk factors

The different causes and risk factors which are leading to udder oedema in dairy goats are given below;

- Breed i.e it is the inherited trait that increases susceptibility to udder oedema.
- Body condition at kidding i.e due to hormonal and physiological changes.
- Difficulty in kidding.
- Fetal membrane retention.
- Stall feeding.
- Lake of proper exercise.
- History of udder oedema.
- Nutrional imbalance i.e high NaCl intake.

3. Diagnosis

Diagnosis is performing on the basis of the clinical signs and also through the radiography and ultrasonography test. The general clinical signs show in case of udder oedema in goats are as under;

- The udder of goat will be enlarged in size and will have irregular increased udder volume and shape.
- There will be fluid accumulation in the tissue spaces of the udder in case of udder oedema.
- The udder will be felt soft and cold on palpation.
- Watery to serous fluid will be aspired after inserting 18 gauge aseptic needle directly into the affected udder.
- The “fingerprint” test is also apply to diagnose the udder oedema.

Diagnostic Imaging Features in Case of Udder Oedema in Goats

Fig. 1: Udder oedema in a cross bred doe goat [8].

Fig. 2: Plain Radiography of udder oedema [7].

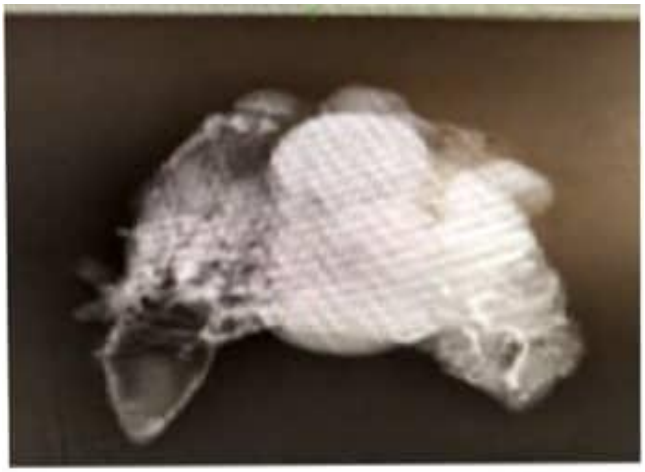

Fig. 3: Double contrast Radiography of udder Oedema [7].

In case of udder oedema there will be swelling and irregular increase in the size of udder occurs (Fig.1). The plain

radiography of udder oedema revealed radio-opecity which is due to the increase in size of udder (Fig.2). In case of multiple abscess there are much more radio-opaque round structures are present which is due to the connection of abscess with teat canal (Fig. 3).

4. Histopathological Changes in Udder

The histopathological changes in case of udder ooedema range from mild to severe type chronic mastitis. In subclinical case the udder tissues show pictures with mild type vacuolar destruction of acinar epithelium and narrowing of lactiferous ducts (Fig.4). The tissues of mammary gland in case of mastitis in goats showed mild to chronic type lymphatic mastitis in which there is proliferation of intralobular and fibrous connective tissues can be seen which is accompanied by infiltration of lymphocyte, macrophages and plasma cells (Fig.5 & 8). Destruction & atrophy of alveoli and alveolar epithelium revealed flattened (Fig.5 & 6). Mononuclear inflammatory cells and some neutrophils with some fibrin network are present in the damaged alveoli (Fig. 7 & 8). Corpora amylacea also noticed inside the acini (Fig.5 & 7). Hyperplasia of epithelial lining of the lactiferous ducts was also reported which was associated with mononuclear cells aggregation and lymphocytic exocytosis (Fig.8). Increase in the vascular thickness and the lumen of blood vessels became narrower. The destruction of hair follicle occured and the hair shaft were fragmented (Fig.9 and 10). The lymph nodes of the mammary gland showed follicular hyperplasia and the extravasated blood into the medullary region. In some cases, depletion lymph also seen (Fig.11).

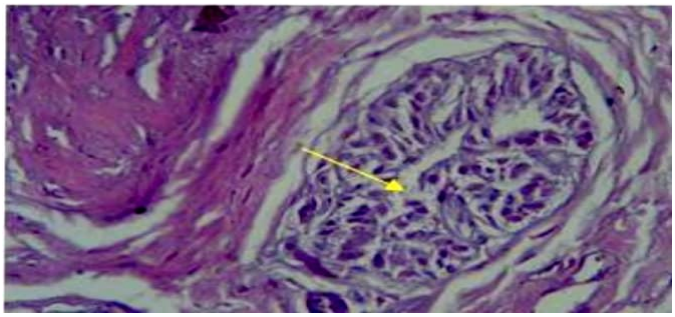

Fig. 4: Vacuolar degeneration of the acinar epithelium [5].

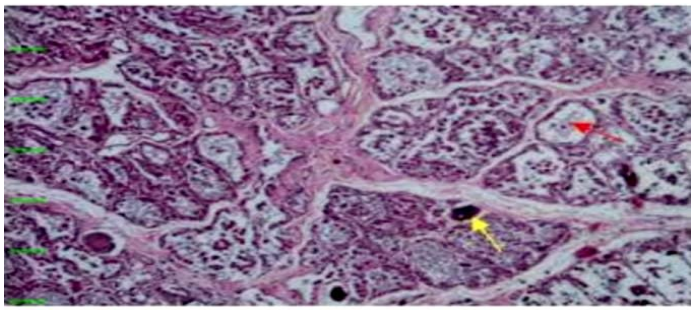

Fig. 5: Vacuolar degeneration, desquamation and destruction of acinar epithelium (red arrow) and Corpora amylacea (yellow arrow) [5].

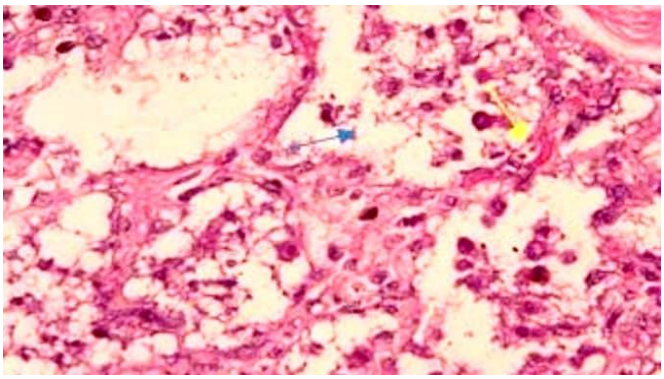

Fig. 6: Focal aggregation of the mononuclear inflammatory cells (blue arrow) and hyperemia of the blood capillaries (yellow arrow) [5].

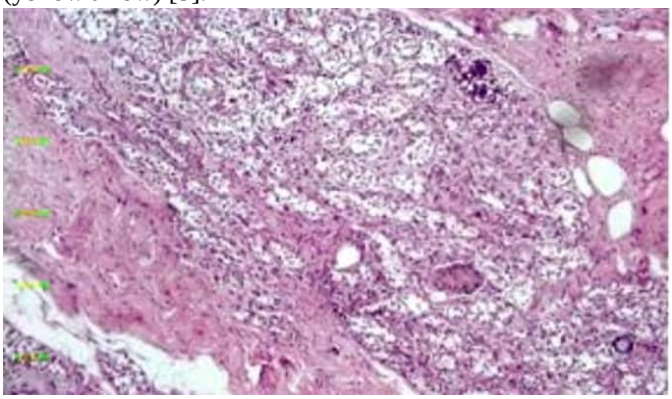

Fig. 7: Focal aggregation of the inflammatory cells and the corpora amylacea [5].

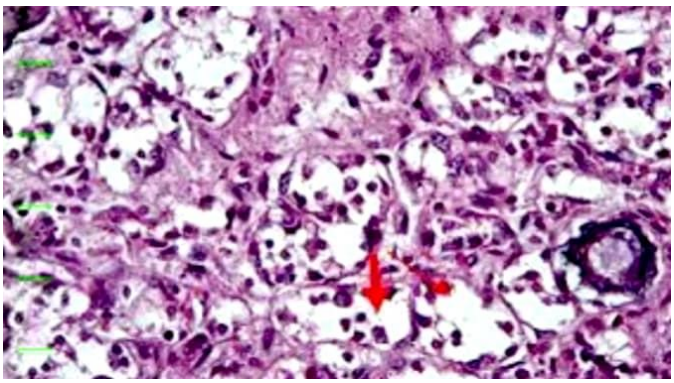

Fig. 8: Vacuolar acuolar desquamation and destruction of acinar epithelium (red arrow) with a focal aggregation of lymphocytes as well as with mild interstitial fibrosis [5].

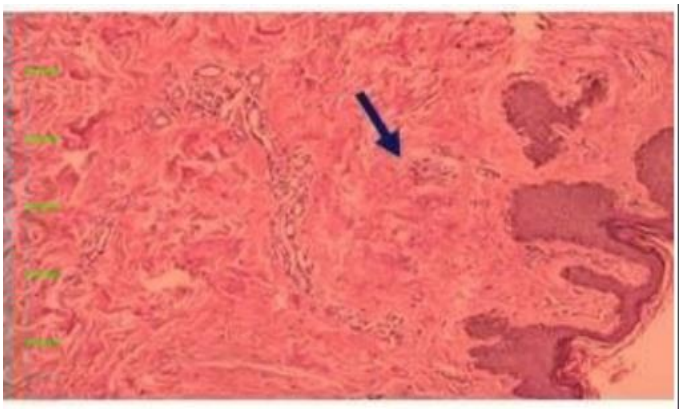

Fig. 9: Hyperkeratosis and hair follicle destruction with fragmented hair shaft (arrow) [5].

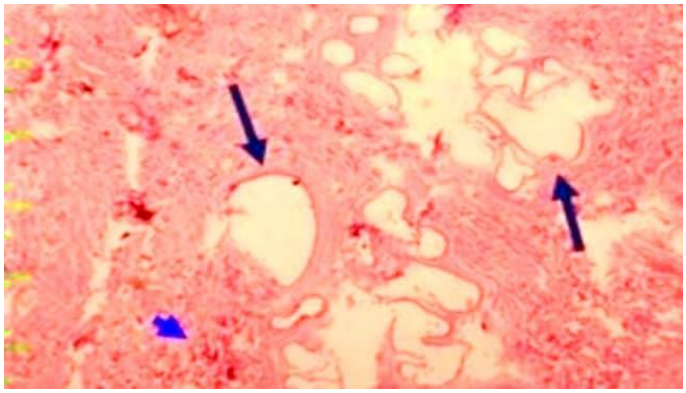

Fig. 10: Hyperkeratosis and Cystic dilation of lactiferous ducts (arrows) as well as lymphocytes infiltration (arrowhead) [5].

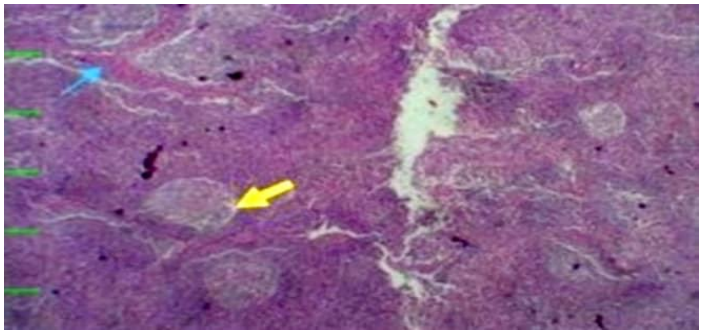

Fig. 11: Depletion and destruction of the lymphoid follicle (yellow arrow) as well as extravasated blood (blue arrow) in the medullary area of uddergland [5].

5. Therapeutic Treatment and Management

5.1 Very limited studies have mentioned successful treatment of the Udder Oedema in goats using a combination of Phosphorus and vitamin D_3 [7, 8].

This describes a succecful treatment using a solution which contains:

20.80 grams' calcium gluconate, 5.33 grams' magnesium hypophosphite, 2.00 grams' magnesium chloride, 1.00-gram Calcium-D- saccharate, 4.33 grams' boric acid and 20.00 grams dextroseper with 100 ml (Milfone-C).

5.2 Udder Oedema in goats can also be treated by using Furosamide; Ceftriaxone; Meloxicam; Chlorpheniramine maleate; Vit A, D3, E with massage and hot fomentation of the affected Udder.

The result indicated that recovery rate from udder oedema in goat was 87.5% after six days of regular therapy.

6. Herbal Treatment/ Household Treatment

6.1 Massage of affected udder by using mustard oil

Mix a little amount of mustard oil with hot water and then use this mixture to massage the affected udder. Mustard oil reduce swelling and increase blood circulation of udder.

6.2 By using turmeric and mustard oil mixture

Mustard oil and powder turmeric are mixed and form paste of it. By applying this past on the affected udder, this past will manimize the swelling of udder and will also destroy the bacteria.

6.3 Jiggery and Black pepper

Give such feed to the animals in which black pepper glow and jiggery are present. It have the qualities to cure the swelling of affected udder.

6.4 By using Garlic

Giving garlic to the animals is also beneficial for preventing udder oedema. after, it prevent animals from bacterial infections. A mixture of 100 grams backing soda, 100 grams lemon juice, 100 grams barley powder, black pepper, 20 grams desi ghee, 1 kg sugar and 100 grams kalmi shora, given twice a day to animals is also helpful.

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