Therapeutic efficacy of arazyme along with some antioxidants, vitamins and minerals in subclinical mastitis in Sirohi goats

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Abstract

In the present investigation, total 100 milk samples from 50 apparently healthy Sirohi goats were collected aseptically. Out of 50 apparently healthy goats, 27 milk samples (udder halves) of 18 goats were found affected with subclinical mastitis. To test the therapeutic efficacy of arazyme along with anti-oxidants, vitamins, minerals and immuno-modulators, the subclinical mastitis affected Sirohi goats were divided into two groups of 9 goats each. Group I was treated with an antibiotic only whereas animals in Group II were treated with antibiotic and arazyme along with antioxidant, antimicriobial, vitamins, minerals and immune-modulator. In group I, only 66.66 per cent goats showed recovery on day 3rd after treatment whereas in group II, there were recovery in 100 percent goats on day 3rd after treatment. It was concluded that the best therapeutic response was evoked with the use of arazyme along with anti-oxidants, vitamins, minerals and immuno-modulators with parental antibiotic.

Key words: Therapeutic efficacy, Arazyme, Subclinical Mastitis, Sirohi Goats

Goat rearing is an important source of livelihood and nutritional security to marginal farmers, landless labourers and tribals in many parts of the country. Goat rearing provides immediate cash income, meat, milk, skin and manure (Adane and Girma, 2008). According to 19th livestock census (2012), goat population in India was 135.17 million and ranks second in the world.

The dairy goat rearers face several challenges such as diseases, inbreeding, poor feeding, lack of market and poor management practices (Ndegwa *et al*., 2000). Diseases are the major cause of economic looses. The mastitis is an economically important disease due to its high morbidity, loss of milk production, high cost of treatment and major adverse effects on quality of by-products made from contaminated milk (Sharma *et al*., 2005a). Subclinical mastitis denotes absence of apparent gross abnormalities in the mammary gland but presence of chemical and bacteriological changes in the milk (Sharma *et al*., 2004). Subclinical mastitis is a major problem affecting dairy goats all over the world. It causes enormous losses through reduced milk quality, poor product hygiene and undesirable changes in the milk composition and consequently influences the national income of the country (Kasozi *et al*., 2014). Several scientists have worked on treatment and control of sub-clinical mastitis in India and abroad. In order to control the subclinical mastitis in dairy goats, appropriate therapeutic and control measures are necessary which include elimination of intramammary infection and improvement in the immunity.

Present investigation was undertaken to determine therapeutic efficacy of Arazyme along with some antioxidants, vitamins and minerals in treatment of subclinical mastitis in Sirohi goats.

Material and Methods

In the present investigation, total 100 milk samples from 50 apparently healthy Sirohi goats of different parity and lacteal stage were collected aseptically. All the milk samples were subjected to various diagnostic tests like cultural examination (Cowan and Steel, 1975) and Modified California Mastitis Test (Schalm and Noorlander, 1957). Out of 50 apparently healthy goats, 27 milk samples (udder halves) of 18 goats were found affected with subclinical mastitis.

The subclinical mastitis affected Sirohi goats were divided into two groups of 9 goats each. Group I was treated with an antibiotic only (amoxycillin sulbactam @ 10 mg/kg b.wt. i. m., O.D. for 3 days) whereas animals in Group II were treated with antibiotic (amoxycillin sulbactam @ 10 mg/kg b.wt. i. m., O.D. for 3 days) and Saftey milk forte @ 25 gm O.D daily for 7 days (arazyme along with antioxidant, antimicriobial, vitamins, minerals and immune-modulator, mkt. by Era

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Animals (P) Ltd. Mumbai). The efficacy of treatment trial was evaluated on the basis of bacteriological cultural examination and modified california mastitis test. When both udder half milk samples of particular goat were found negative on cultural examination and modified california mastitis test, it was considered as recovered from subclinical mastitis. The drug trial showing faster recovery was considered as best therapeutic regimen.

The statistical analysis of the data was done using statistical method described by Snedecor and Cochran (1994).

Results and Discussion

The prevalence of subclinical mastitis in Sirohi goats was 27 per cent (27/100) and; 36 per cent (18/50) on udder halves basis and animal basis, respectively by bacteriological culture examination and modified CMT. Almost similar results have also been reported by Ali-Al Zainy *et al*. (2015) and Kumar *et al*. (2016). Higher prevalence of subclinical mastitis in goats were reported by Sharma *et al*. (2005a), Kumar *et al.* (2016) and Ferdous *et al*. (2018). Comparatively lower prevalence of subclinical mastitis in Sirohi goats may be because of hardy and disease resistant breed.

To test the therapeutic efficacy of arazyme along with anti-oxidants, vitamins, minerals and immuno-modulators, the subclinical mastitis affected Sirohi goats were divided into two groups of 9 goats each.

The response of therapy in group I (antibiotic-amoxycillin-sulbactam only) is depicted in Table 1. There was change in the status of the diagnostic tests viz. bacteriological culture examination and modified california mastitis test before and after treatment. The udder half milk samples of the affected goats returned to negative for bacteriological culture examination and modified california mastitis test, on the 3th day after treatment except 3 goats. Thus, 66.66 percent (6/9) goats recovered on day 3rd day post therapy. In all the goats of group I, the diagnostic tests were found normal (bacteriological culture examination and modified California mastitis test negative) on 7th day after treatment. Thus, there was recovery from subclinical mastitis in 100 percent (9/9) goats of group I on 7th day after treatment.

The response of the therapy in group II is depicted in Table 2. The milk samples of all the goats in this group showed negative for bacterial culture and modified california mastitis test on day 3rd after treatment. Thus, 100 percent (9/9) goats recovered on day 3rd after treatment in group II.

The interpretation of the results in respect to evaluation of both the treatment trial clearly indicated that there was variation in both the groups as far as faster recovery was concern. Out of both the groups, in group I, only 66.66 percent goats showed recovery on day 3rd after treatment. There was recovery in all the animals of the group I (100 percent) on day 7th after treatment whereas in group II, there was recovery in 100 percent goats on day 3rd after treatment.

It was concluded that the best therapeutic response was evoked with the use of arazyme along with anti-oxidants, vitamins, minerals and immuno-modulators with parental antibiotic (amoxycillin-sulbactam). Complete recovery was observed on day 3rd post therapy in this group and the diagnostic tests were within normal range (negative for bacterial culture and modified california mastitis test).

There was complete recovery in group II on 3rd day post treatment which is indicative of the fact that arazyme along with anti-oxidants, vitamins, minerals and immuno-modulators has importance in eliminating the intra-mammary infection in subclinical mastitic goats by boosting up the immunity. Further, no new intra-mammary infection was observed in the group which supported that arazyme along with anti-oxidants, vitamins, minerals and immuno-modulators is effective

Table 1. Results of therapeutic trial in Group I (Antibiotic only)

S. No.	Diagnostic Tests	Number of animals positive for subclinical mastitis		
		Before treatment	After treatment	
		0 day	3rd day	7th day
1.	BCE	9	3(33.33%)	0
2.	MCMT	9	3(33.33%)	0

Table 2. Results of therapeutic trial in Group II (antibiotic with arazyme along with anti-oxidants, vitamins, minerals and immuno-modulators

S. No.	Diagnostic Tests	Number of animals positive for subclinical mastitis	
		Before treatment	After treatment
		0 day	3rd day
1.	BCE	8	0
2.	MCMT	9	0

in preventing new infection in the mammary gland. Similar findings were also reported by Sharma *et al*. (2018) in cows.

The mechanism of action of arazyme along with anti-oxidants, vitamins, minerals and immuno-modulators may be explained. Effective proteolytic enzyme obtained from microorganism present in Korean wild spider and supposed to have an anti-inflammatory and fibrolytic effect. Further, the fortified action of arazyme with vitamin E and selenium improved udder immunity, increase in polymorphonuclear cells in udder and increase intracellular killing of pathogens.

Iodine has some antimicrobial and fibrolytic action. Vitamin C reduce capillary bleeding and healing inducer (Joshi and Sharma, 2013). Zinc and methionine reduced further penetration of microorganism and maintain thickness of keratin layer of teat orifice (Yang and Li, 2015). Singh and Bansal (2001) reported that zinc deficiency in ruminants lead to in weaking of skin and other stratified epithelia (i.e. keratinocytes). Because mammary gland is essentially a skin gland and the importance of keratin lining of the streak canal in prevention of infection is well known, speculation that zinc supplementation may enhance resistance to subclinical mastitis is tempting . Zinc is also known to be associated with enzyme involved in the phagocytic oxidative burst, in cellular maturation and functioning of B and T lymphocytes and macrophages. As such zinc boosts immune function. In general, supplementation of zinc methionine resulted in increase milk production and decrease in total somatic cell count. Generally zinc-chelates are supplemented because they are more bioavailable to the ruminant compared with inorganic zinc.

Conclusions

The interpretation of the results in respect to evaluation of both the treatment trial clearly indicated that there was variation in both the groups as far as faster recovery was concern. Out of both the groups, in group I, 66.66 percent goats showed recovery on day 3rd after treatment but recovery in all the animals of the group I (100 percent) was recorded on day 7th after treatment whereas in group II there was recovery in 100 percent animals on day 3rd after treatment. The best therapeutic response was evoked with the use of Arazyme along with anti-oxidants, vitamins, minerals and immuno-modulators with antibiotic.

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