OCCURRENCE OF TEAT FIBROSIS AND EFFICACY OF VARIOUS THERAPEUTIC REGIMENS IN DAIRY ANIMALS

Rajendra Yadav[1], Sandeep[2], Umed Singh Mehra[2], Pankaj Kumar[3] and Man Mohan Mata[4]
Regional Referral Veterinary Diagnostic and Extension Centre (RVDEC), Mahendergarh
Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar-125 004, Haryana

Received on: 13.08.2018
Accepted on: 18.11.2018

ABSTRACT

The study was conducted in unorganized sector under field conditions on sixty animals including cattle and buffaloes that were suffering from varying degree of teat fibrosis. Animals were randomly categorized into six groups consisting of ten animals each to observe the therapeutic efficacy of various treatment regimes provided to them for six days. Maximum numbers of cases (55%) of teat fibrosis were recorded in first lactation with more than 70% cases being reported in first one month of the parturition and subsequently decreased. Left hind quarter was most frequently affected (45%) followed by left fore (23.3%), right hind (20%) and right fore (11.7%). Results interpreted that combination of two or more drugs (potassium iodide, homeopathic preparations and serratiopeptidase) were comparatively better for 80% or more animals showing good clinical response after six days of treatment.

Key words: Cattle, buffalo, fibrosis, therapeutic efficacy

Introduction

Farming community of our country is mainly dependent on agriculture and livestock for their earnings. Increasing human population is resulting in smaller land holdings thereby shifting load towards livestock side. Among livestock, cattle and buffalo are the main assets of the farmers. The productivity of cattle and buffalo lies mainly by way of milk production and reproduction. To make their livestock rearing profitable and sustainable, farmers have to face and manage several problems including various diseases. Udder affections conflict direct and heavy losses by way of decreasing milk production and decreasing value of the animal. Though, mastitis is the major problem affecting udder and causing heavy economic losses, role of teat/udder fibrosis cannot be ignored as it constitutes a good fraction of cases. The milk stream becomes thin with decreased milk output and milking becomes very difficult and time consuming in cases of teat fibrosis. On palpation a straight cord like or round hard mass can be felt in affected teat(s) in these cases. Fibrosis may be diffused, involving whole quarter or local varying in size from pea like lesion to bigger masses near the base or tip of the teat (Blood *et al.,* 2006). In extreme cases complete blockage of teat canal occurs and may require surgical intervention. Teat fibrosis also reduces the market value of the affected animal. Exact cause of this condition is not clear. However, repeated trauma due to mechanical injuries, thumb milking and calf suckling are the main contributory factors. Sometimes mastitis can also result into fibrosis of quarter followed by teat canal. Ragab *et al.* (2017) reported a 6.26% prevalence of udder fibrosis in cattle while 16% incidence of fibrosis among all the teat and udder lesions was found by Rambabu *et al.* (2011). Dairy animals having teat fibrosis do not usually respond to the conventional antibiotic treatment and the affected quarter(s) is ultimately rendered non functional resulting in a considerable economic loss to animal owners. The present study was therefore undertaken with an objective of evaluating the extent of efficacy of various non antibiotic therapeutic regimens in clinical cases of teat fibrosis in dairy animals.

Materials and Methods

The study was focused under field conditions in dairy cattle and buffaloes suffering from varying degree of teat fibrosis. Affected animals were selected based on absence of observable clinical sign and symptoms of acute inflammatory swelling on teat/udder, negative modified white side test of milk sample and presence of fibrotic growth in teat. Owners were asked about number of lactations, stage of lactation, quarter(s) affected, decrease in milk yield and duration of fibrosis in these animals. The collected data were further analyzed. Some of these animals were reportedly treated earlier with conventional allopathic therapy along with antibiotics with no or slight improvement.

To observe the therapeutic efficacy of various treatment regimens, animals were randomly categorized into six groups (group I-VI) consisting of ten animals each. Every group was treated separately with different treatments like group I was treated with potassium iodide, group II with homeopathic preparations, group III with serratiopeptidase, group IV with potassium iodide +homeopathic preparations, group V with potassium iodide+serratiopeptidase and group VI with potassium iodide+homeopathic preparations+ serratiopeptidase, respectively for a minimum of six days (Table 4). Potassium iodide was given @ 7 g once a day orally, serratiopeptidase @ 120 mg twice a day orally and homeopathic preparations (Silicea 200C, Cale. Flour 200C, Phytolacca-Dioca 200C, Phosphorus 30C, Carbo-Animals 30C and Alc. Cont. 91.4%) @ 30 drops thrice a day orally. Potassium iodide is recommended to treat various ailments like foot rot, lumpy jaw (*Actinomyces bovis)*, wooden tongue (*Actinobacillus lignieresi)*, bronchitis etc. in bovines and may be given up to the maximum dose rate of 15 gm/day orally in adult animals (Papich *et al.,* 2016). Homeopathy is a natural remedy to assist by stimulating body's natural defence mechanism for recovery and it can play a vital role in successful

[1]Animal Health Specialist and corresponding author: Email: drrajendrayadav@gmail.com; [2]Veterinary Assistant Surgeon, Department of Animal Husbandry, Government of Haryana; [3,4]Assistant Disease Investigating Officer, Disease Investigation Laboratory, Rohtak

treatment of various ailments like calcaria flour is known for its ability to eliminate fibrosis (Edwad, 2002), while silicea stimulates expulsion of foreign body from tissues in chronic low grade inflammatory lesions (Day, 1992; Shah, 2003). However, serratiopeptidase is an enzyme isolated from the non pathogenic enterobacteria *Serratia* E15 found in silkworms and it possess proteolytic, fibrinolytic and caseinolytic properties (Bhagat *et al.,* 2013). Enzyme has the unique ability to dissolve the dead and damaged tissue i.e a byproduct of the healing response without harming living tissues (Ishihara *et al.,* 1983). To examine the therapeutic response all these animals were again examined after six days of treatment for presence/absence of observable clinical sign and symptoms of inflammatory swelling on teat/udder, modified white side test of milk sample and presence/reduction/absence of fibrotic growth in teat.

Results and Discussion

Clinical examination of affected animals showed varying degrees of fibrosis either diffuse or in form of fibrotic nodules of varying size near the base of teat cistern or tip of the teat or as hard fibrous cord like structure palpated in the teat cistern. Data was interpreted after collection from the owners of the animals and found that duration of teat fibrosis was ranging between 3 to 30 days with a decrease in milk output of 10% to 90% in affected quarter(s). This decrease in milk yield from affected quarter(s) was mainly due to obstruction in teat canal occurs because of fibrotic growth. Lactation wise occurrence of the problem is presented in Table 1. Maximum numbers of cases (55%) were recorded in first lactation followed by animals in second (20%), third (11.7%), fourth (11.7%) and fifth (1.6%) lactation. The occurrence after fourth lactation was very low that not even a single animal was reported with problem of teat fibrosis in sixth or subsequent lactations during the study. Also to look after the occurrence of the problem, the stage of lactation was also recorded (Table 2). More than 70% cases being recorded in first one month of the parturition and subsequently decrease up to six months (3.3%) after parturition. There were only 6.7% of animals suffering from this problem having the history of more than six months of parturition. Higher incidence of teat fibrosis in first lactation or early period of lactation might be due to the fact that first calvers are not very used to for milking and calf suckling and showing some resistance in initial period of lactation due to which there are more chances of mechanical injuries to the teats. Bristol (1989) has found that most teat injuries occur within one month of calving, when cows are in high production. Sharma *et al.* (2005) has also observed that maximum udder lesions were found in first lactation (42.22%) followed by second (20.00%), third, fourth, fifth and so on and that is also in first two months of lactation/ early lactation. Quarter wise occurrence of the teat fibrosis was also observed and the results are presented in Table 3. Left hind quarter was found to be most frequently affected (45%) followed by left fore (23.3%), right hind (20%) and right fore (11.7%), respectively. As the study was conducted under field conditions in unorganized sector where hand milking was carried out mostly by knuckling method using thumb pressure and sitting on the left side of animal, there were chances of application of more pressure during milking on left quarters which might be the probable cause of higher incidence of teat fibrosis in this side. Improper milking methods like milking using thumb and pressing or pulling the teat causes a mechanical injury to teat (Pearson *et al.,* 1972). Similarly, Sharma *et al.* (2016), Mustafa *et al.* (2013) and Sharma *et al.* (2005) has also reported higher incidence of mastitis and other teat lesions in left quarters than right.

Results of therapeutic efficacy of various treatment regimens are presented in Table 4. The effect of therapy in clinical cases of teat fibrosis in dairy animals was studied in terms of clinical response i.e. reduction in size of fibrosed mass. This response to therapy was categorized as (i) Good clinical response (reduction in size by more than 50%), (ii) Fair clinical response (reduction in size occurred but less than 50%) and (iii) No clinical response (no reduction in size of fibrosed mass). In single drug therapy potassium iodide was found more effective and gives good clinical response in five out of ten animals in group followed by serratiopeptidase (4) and homeopathic preparation (2). In combination of two drugs therapy potassium iodide + serratiopeptidase group showed good clinical response in nine out of ten animals over potassium iodide + homeopathic preparation group in which eight animals showed good clinical response. In group VI, combination of all the three drugs potassium iodide + homeopathic preparation + serratiopeptidase were used and nine out of ten animals shows good clinical response and one animal showed fair clinical response. It was found that a combination of two or more drugs gave comparatively better results with 80% or more animals showing good clinical response after six days of treatment. Varshney and Naresh (2004) used homeopathic preparations with 80% and 96.72% effectively in cases of fibrosed and non-fibrosed mastitis, respectively but the recovery period was 21-42 days (fibrosed) and 4-15 days (non-fibrosed). Chandel *et al.* (2009) reported that 93% cases of fibrosis responded to combination of antibiotics and homeopathy therapy in cattle during a study period of 6 to 30 days. Shah *et al.* (2010) reported 46.45% and 75.0% efficacy of the homeopathic treatment in clinical cases of teat fibrosis in bovines in a study period of 20 and 40 days, respectively. Some other workers (Upadhyay *et al*., 1995; Chandel *et al.* 2009) have also used homeopathic preparations by different routes of administration and dosage for varying periods and achieved a success rate of 80.95% and 93.0%, respectively in the treating fibrosed mastitic cows. These variations in the results may be attributed to the difference in the routes of administration, dosage or combination of therapy adopted. There was also a recovery of milk production from affected quarter (s) ranging from 20% to 80% in the animals showing fair to good clinical response to the treatment. This might be due to ease in milking and increase in milk output after decreasing size of fibrotic mass in the concerned quarter(s) of udder.

During the follow up, it was found that in twelve out of the sixty animals subjected to therapeutic studies, at the end of six days of treatment, mastitis was also detected by presence of inflammatory swelling and positive modified white side test performed on milk sample of affected quarter(s).

References

Bhagat S, Agarwal M and Roy V (2013) Serratiopeptidase: a systematic review of the existing evidence. *Int. J. Surg.* **11:** 209–217.

Table 1: Lactation wise occurrence of teat fibrosis in dairy animals (N = 60)

No. of lactation	No. of animals affected	Percentage
I	33	55
II	12	20
III	07	11.7
IV	07	11.7
V	01	1.6
>V	-	-

Table 2: Lactation stage wise occurrence of teat fibrosis in dairy animals (N = 60)

Lactation stage	No. of animals affected	Percentage
Up to 2 weeks (14 days)	14	23.3
15 days to 1 month	29	48.4
>1 month to 3 months	11	18.3
>3 months to 6 months	02	3.3
>6 months	04	6.7

Table 3: Quarter wise occurrence of teat fibrosis in dairy animals (N = 60)

Quarter	No. of animals affected	Percentage
Left fore (LF)	14	23.3
Right fore (RF)	07	11.7
Left hind (LH)	27	45
Right hind (RH)	12	20

Table 4: Therapeutic response of different treatment regimes in cases of teat fibrosis in dairy animals

Medicines used	Total No. of cases treated	Good Clinical response	Fair clinical response	No clinical response
Potassium iodide	10	5	4	1
Homeopathic preparation	10	2	6	2
Serratiopeptidase	10	4	3	3
Potassium iodide + Homeopathic preparation	10	8	2	-
Potassium iodide + Serratiopeptidase	10	9	1	-
Potassium iodide + Homeopathic preparation + Serratiopeptidase	10	9	1	-

Blood DC, Radostits OM and Henderson JA (2006) Veterinary Medicine. English Language Book Society. Bailliere, Tindal, pp. 451-81.

Bristol DG (1989) Teat and udder surgery in dairy cattle-part I. *Compend. Food Anim.* **11:** 868-873.

Chandel BS, Dadawala AI, Chauhan HC, Parsani HR and Kumar, P (2009) Efficacy of a homeopathic complex and antibiotics in treatment of clinical mastitic cattle in north Gujarat. *Vet. World* **2**(10): 383-384.

Day CEI (1992) Alternative medicine. Bovine Medicine (1st ed.). pp: 889-896.

Edwad HR (2002) Homeopathic Veterinary Medicine. B. Jain Publishers (P) Ltd., New Delhi. pp. 26-41.

Ishihara Y, Kitamura S and Takaku F (1983) Experimental studies on distribution of cefotiam, a new betalactam antibiotic, in the lung and trachea of rabbits - Combined effects with serratiopeptidase. *Jpn. J. Antibiot.* **36**(10): 2665–2670.

Mustafa YS, Awan FN and Zaman T (2013) Prevalence and antibacterial susceptibility in mastitis in buffalo and cow in district Lahore-Pakistan. *Buffalo Bulletin*. **32**(4): 307-314.

Papich MG (2016) Potassium Iodide**.** Saunders Handbook of Veterinary Drugs (4th ed.) - Small and Large Animals. pp. 657–659.

Pearson JK, Greer DO, Spence BK, McParland PJ, McKinley DL, Dunlop WL and Acheson AW (1972) Factors involved in mastitis control: A comparative study between high and low incidence herds. *Vet. Rec.* **91:** 615-623

Ragab GH, Seif MM, Abdel-Rahman MA and Qutp M (2017) Prevalence of udder and teat affections in large ruminant in Beni-Suef and El-Fayoum provinces. *J. Vet. Med. Res.* **24**(1): 321-331.

Rambabu K, Sreenu M, Suresh Kumar RV and Rao TSC (2011) Incidence of udder and teat affections in buffaloes. *Tamilnadu J. Vet. Anim. Sci.* **7**(6): 309-311.

Shah KA, Andrabi SA and Sumbul S (2010) A study on homeopathic treatment of teat fibrosis in bovines. *Vet Scan.* **5**(1): 57.

Shah MA (2003) Silicea and foreign body. *Homeo. Medical Times* **8:** 59.

Sharma A, Sharma S, Singh N, Sharma V and Pal RS (2016) Impact of udder and teat morphometry on udder health in Tharparkar cows under climatic condition of hot arid region of thar desert. *Trop. Anim. Health Prod.* **48:** 1647–1652.

Sharma S, Singh KB, Bansal BK and Sharma DK (2005) Clinical symptomatology and epidemiological observations on teat skin lesions in buffaloes. *Buffalo Bulletin*. **24**(1): 12-16.

Upadhyay AK, Rajora VS, Pachauri SP and Gupta GC (1995) Evaluation of homeopathic drugs in bovine mastitis. *Indian Vet. Med. Jour.* **19:** 65-67.

Varshney JP and Naresh R (2004) Evaluation of a homeopathic complex in the clinical management of udder diseases of riverine buffaloes. *Homeopathy* **93**(1): 17-20.