

## ORIGINAL PAPER

# Comparative efficacy of homeopathic and allopathic systems of medicine in the management of clinical mastitis of Indian dairy cows

JP Varshney and R Naresh\*

*Division of Medicine, Indian Veterinary Research Institute, Izatnagar-243 122, India*

**Mastitis is the major problem of dairy animals despite a number of preventive and therapeutic approaches. Treatment is costly and out of reach of farmers of developing countries like India. The treatment cost of bovine mastitis with conventional treatment has been calculated. Good results have been claimed with homeopathic treatment however, treatment costs are not available. This article reports the treatment economics of homeopathic drugs conventional drugs for the management of bovine mastitis.**

**Ninety-six mastitic quarters (non-fibrosed 67 and fibrosed 29) were treated with a homeopathic combination medicine. Another 96 quarters with acute mastitis (non-fibrosed) treated with different antibiotics were included in the study. The animals were selected from dairy farm of the Indian Veterinary Research Institute and from private dairy farms. The overall effectiveness of homeopathic combination medicine in the treatment of acute non-fibrosed mastitis was 86.6% with a mean recovery period of 7.7 days (range 3–28), and total cost of therapy as Indian Rupees 21.4 (€0.39, US\$0.47). The corresponding cure rate for the antibiotic group was 59.2% with a mean recovery period of 4.5 days (range 2–15) and an average treatment cost of Rs.149.20 (€2.69, US\$3.28). We conclude that the combination of *Phytolacca*, *Calcarea fluorica.*, *Silica*, *Belladonna*, *Bryonia*, *Arnica*, *Conium* and *Ipecacuanha* (Healwell VT-6) was effective and economical in the management of mastitis in lactating dairy cows. *Homeopathy* (2005) 94, 81–85.**

**Keywords:** antibiotics; bovine; comparative efficacy; homeopathy; mastitis; treatment cost

## Introduction

Mastitis is an economically important disease of dairy animals throughout world. In India, there are substantial annual economic losses due to clinical (Rs.9876 million, €178m, US\$217m) and subclinical (Rs.26460m, €476m, US\$582m) mastitis in cows.<sup>1</sup> Poor husbandry and inadequate veterinary infrastructure demands efforts to develop safe, efficacious and ecofriendly approaches for its containment. Conven-

tional treatment depends on the use of antibiotics, which are not only costly<sup>2</sup> but residues in milk and meat pose human health risks. Antibiotic selection needs cultural sensitivity tests which are not available in Indian field conditions. Indiscriminate use of antibiotics results in the emergence of resistant bacterial strains causing an increase in treatment failures. Even in developed countries, the cure rate of most of the antibiotics is approximately 60% in field conditions and with the involvement of  $\beta$ -lactamase producing organisms worse still.<sup>3</sup> In recent years, interest in complementary and alternative therapies for the management of diseases has increased. Homeopathy is emerging as an alternative therapy in veterinary medicine<sup>4</sup> for its ability to prevent recurrence of diseases without leaving residues

\*Correspondence: Ram Naresh, Division of Medicine, Indian Veterinary Research Institute, Izatnagar-243 122, India.  
E-mail: ramnaresh7@rediffmail.com  
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in animal products. Homeopathy depends on the totality of physical and psychological symptoms of the diseased animals and aiming to augment the body's immune defenses, supporting these rather than treating, inhibiting, or suppressing symptoms. Individual homeopathic medicines have been used in the management of the mastitis<sup>5,7</sup> with encouraging results. Of late, homeopathic combination remedies are becoming commercially popular in many countries. In India, we have shown promising results in the management of clinical mastitis in buffaloes using a homeopathic combination medicine.<sup>8</sup> The present study was undertaken to compare the effectiveness of a homeopathic combination medicine compared to antibiotics in the management of clinical mastitis of lactating cows.

## Materials and methods

### Animals

Lactating crossbred (Haryana × Jersey/Holstein Friesian/Brown Swiss) cows of Livestock Production Research Section of Indian Veterinary Research Institute, Izatnagar, crossbred cows of private dairy farm (Panchayati Goshala, Rishikesh, Uttaranchal State of India) and crossbred/nondescript dairy cows of private owners (Bareilly District, Uttar Pradesh State) attending Referral Veterinary Polyclinic of the institute formed the material for the study. All the animals included in the study were in 2nd to 6th lactation and not suffering from any other clinical illness than mastitis at the time of study. The presence of inflammatory signs in udder (heat, pain, swelling and edema), asymmetry of shape and size of quarter; and physical changes in milk (flakes/clots, discoloration, consistency and CMT score) were the criteria for inclusion of the animals in study. Cases of subclinical mastitis were not included. A total of 96 mastitic quarters (non-fibrosed 67 and fibrosed 29) from 57 animals were treated with a homeopathic combination medicine. Another 96 quarters with acute mastitis (non-fibrosed) treated with various antibiotics were included in the study for comparison.

### Drugs

A homeopathic combination medicine, Healwell VT-6 (Sintex International Limited, Kalol, India), consisting of *Phytolacca* 200c, *Calcarea fluorica*. 200c, *Silica* 30c, *Belladonna* 30c, *Bryonia* 30c, *Arnica* 30c, *Conium* 30c and *Ipecacuanha* 30c in equal amount was used. It was administered orally at the dose rate of 15 pills twice daily or 10 pills four times a day to 42 (fibrosed 23, non-fibrosed 37, total 60 quarters) and 15 (fibrosed 6, non-fibrosed 30, total 36 quarters) mastitic cows respectively as a sole medicine until complete recovery or drying off of the quarters. Cows showing no response within first few days were excluded from the study.

Antibiotic treated cows received various regimes according to availability and local practice at the farms concerned. Intramammary antibiotic infusion therapy with or without parenteral antibiotic was adopted in 83 mastitic cows. A combination of procaine penicillin G (IP) 100,000 units, streptomycin sulfate (IP) 100 mg, Sulfamerazine (BP) 500 mg and hydrocortisone acetate IP 200 mg in plasto base (Pendistrin SH, Sarabhai Chemicals Ltd., India) was infused intramammary twice daily with parenteral antibiotic in 12 mastitic quarters of 9 cows and without parenteral antibiotic in 31 mastitic quarters of 27 cows, respectively. Thirteen mastitic quarter of 10 cows were treated with intramammary infusion of 500 mg enrofloxacin solution (Enrocin, Ranbaxy Ltd. containing 100 mg/ml, benzyl alcohol IP 1.5% V/V and distilled water q.s.) alone and 10 mastitic cows with 11 mastitic quarters received intramammary infusion of enrofloxacin along with intramuscular injection of enrofloxacin (5 mg/kg b. wt.) daily. Twenty two cows with 22 mastitic quarters received 12 h intramammary infusion of a combination of ampicillin sodium (75 mg) and cloxacillin sodium (200 mg) (Tilox, Wockherdt India Ltd.) while 5 cows with 7 mastitic quarters were treated with intramammary infusion of a combination of colistin (500,000 units) and cloxacillin sodium (200 mg) (Mammitel, Intas Pharmaceutical Ltd.) every 12 h for 4 consecutive occasions only.

### Experimental design

The number of animals/quarters was not fixed initially. Allocation to different groups was at random, allocation was determined by coin toss. Efforts were made to include maximum number of mastitic cows from November 2001 to March 2003. The duration of the treatment with the homeopathic combination medicine was not defined. Intramammary antibiotics were given daily until response or drying off the quarters except in case of a combination of cloxacillin and colistin (Mammitel) which was given 12 h for 4 doses. No other therapy was given during the treatment except stripping of quarters twice daily (homeopathic treatment) or before intramammary infusion with antibiotic. Allocation to twice or four times daily homeopathic treatment was per center (not randomized).

### Evaluation criteria

The diagnosis of clinical mastitis was based on physical examination of udder and milk.<sup>3</sup> Milk was examined for colour, clots, flakes and consistency. Assessors were blind with respect to treatment allocation. Signs of inflammation (heat, pain, swelling and edema), symmetry, shape, size of quarter were recorded at the time of diagnosis as well for evaluation of treatment. The California mastitis test (CMT) was conducted on milk as per schedule. When the physical changes of udder and milk, and CMT reaction

returned to normal, the quarter was defined as cured. The physical changes of udder and milk were defined as follows:

- 0—no change/normal.
- + - mild change,
- + + —moderate change.
- + + + - severe changes.

CMT score was given as

- 0- no change in milk,
- + - gel is formed,
- + + —gel becomes thick and lumpy,
- + + + gel adheres to bottom of the paddle.

The CMT reagent was prepared by mixing 10 ml of Teepol (Merck Ltd.), 1 ml (1:100) of bromocresol purple and distilled water up to 100 ml.

#### Statistical analysis

The data were analyzed using students *T*-test.<sup>8</sup>

## Results

### Fibrosed mastitis

The quarter cure rate with the homeopathic combination medicine Healwell VT-6 was lower (56.5% with a mean recovery period of 23 days) when the drug was given at 15 pills twice daily as compared to that (66.6% with a mean recovery period of 9.7 days) when the drug was given at 10 pills four times a day (Table 1). The mean recovery period was significantly ( $P < 0.05$ ) shorter with four times daily treatment. The average total cost of the treatment was also significantly ( $P < 0.05$ ) lower (Rs.31.29, €0.57, US\$0.69) with four times daily treatment compared to twice daily (Rs.55.89, €1.00, US\$1.23).

### Non-fibrosed mastitis

In cases of non-fibrosed mastitis, the quarters cure rate with homeopathic combination medicine was

higher (93.3%) in cows given 10 pills four times daily as compared to that (81.1%) of cows administered 15 pills twice daily. The mean recovery period (5.03 days) was statistically ( $P < 0.05$ ) lower with four times, rather than twice daily (9.83 days). The Four dose schedule was significantly ( $P < 0.05$ ) cheaper (Rs.16.31 €0.29, US\$0.36) than the two dose schedules (Rs.23.80, €0.43, US\$0.52).

The overall efficacy of the homeopathic combination medicine, irrespective of dose schedule, in the management of non-fibrosed mastitis was 86.6% with a mean recovery period of 7.68 days (range 3-28), and total cost of therapy as Rs.21.44 (€0.39, US\$0.47). The quarter cure rate of antibiotic group was 59.2% with a mean recovery period of 4.54 days (range 2-15) and an average treatment cost of Rs.149.20 (€27, US\$33) (Table 2). The average total cost of treatment with homeopathic combination medicine was significantly ( $P < 0.05$ ) lower than that of antibiotics (pooled or individual). However, mean recovery period was significantly ( $P < 0.05$ ) longer with homeopathic combination medicine than antibiotics.

Amongst antibiotics, clinical efficacy of intramammary infusions of Pendisrtin SH (penicillin, streptomycin, sulfamerazine and hydrocortisone) with or without parenteral antibiotics was similar (66.7 vs. 67.7%) with no significant difference in the mean recovery period (4.25 vs. 4.48 d). However, the addition of parenteral antibiotics made the treatment much more costly (Rs.274.00, €4.93, US\$6.00 vs. Rs.67.20, €1.21 US\$1.48). Cure rate with intramammary administration of enrofloxacin alone was 36.4% only with a mean recovery period of 4.6 d, improving to 52.8% with the concurrent parenteral enrofloxacin but this increased treatment cost (Rs.280.60, €5.05, US\$6.17). Intramammary infusion of a combination of ampicillin and cloxacillin (Tilox) showed 59.1% quarter cure rate with a mean recovery period of 3.9 d and was more costly than Pendistrin SH alone. Amongst all these antibiotics, the clinical efficacy of a combination of Colistin and cloxacillin was highest (71.4%) with a mean recovery period of 4.71 d but the treatment was the most costly (Rs.120.00, €2.16, US\$2.64).

**Table 1** Comparative efficacy of homeopathic combination medicine at two dose schedules in the management of clinical mastitis in lactating dairy cows

No. of quarters affected	Dose rate	Quarter cure rate (%)	Recovery period (days)			Per head per day cost of treatment (Rupees)	Average cost of total treatment (Rupees)
			Mean	S.E.	Range		
<b>Fibrosed mastitis</b>							
6	10 pills four times daily	66.60	9.66	1.89	6-17	3.24	31.29
23	15 pills twice daily	56.52	23.00	2.89	6-52	2.43	55.89
<b>Non-fibrosed mastitis</b>							
30	10 pills four times daily	93.33	5.03	0.28	3-7	3.24	16.31
37	15 pills twice daily	81.08	9.83	0.91	3-28	2.43	23.88

<sup>\*</sup> $P < 0.05$ .

**Table 2** Comparative efficacy of a homeopathic combination medicine and antibiotics in the management of non-fibrosed clinical mastitis in lactating cows

Group	Drugs	No. of quarters treated	Quarter cure rate	Recovery period (days)		Range	Cost of treatment (Rupees)	
				Mean	S.E.		Per head per day	Average total cost
1	Homeopathic combination medicine orally	67	86.56	7.68	0.59	3-28	2.79	21.44* (€0.39, US\$0.47)
2.	Antibiotics (pooled)	96	59.18	4.54	0.20	2-15	34.04	149.20 (€2.69, US\$3.28)
(i)	Combination of penicillin, streptomycin, sulfamerazine and hydrocortisone (Pencidrin SH) intramammary	31	67.74	4.48	0.32	2-11	15.00	67.20 (€1.21, US\$1.48)
(ii)	(i) with Parenteral antibiotics	12	66.66	4.25	0.48	2-7	68.00	274.00 (€4.93, US\$6.00)
(iii)	Injectable enrofloxacin (500 mg) intramammary	13	36.36	4.61	0.51	3-5	25.50	71.50 (€1.29, US\$1.57)
(iv)	(iii) with intramuscular enrofloxacin at 5 mg/kg	11	52.84	6.27	1.01	3-15	44.75	280.60 (€5.05, US\$6.17)
(v)	A combination of ampicillin and cloxacillin (Tilox) intramammary	22	59.09	3.90	0.35	2-10	21.00	81.90 (€1.47, US\$1.80)
(vi)	A combination of colistin and cloxacillin (Mammitel) intramammary	7	71.42	4.71	0.47	3-7	30.00	120.00 (€2.16, US\$2.64)

\*  $P < 0.05$ .  
\*\*  $P < 0.01$ .

## Discussion

Various single homeopathic medicines have been used in the management of mammary gland disorders of dairy cows with variable results in various parts of the worlds.<sup>7,9,12</sup> Homeopathic complexes have commercially popular in European countries.<sup>13,14</sup> In India, some preliminary trials using homeopathic combination remedies in the management of mammary gland affections of cows and buffaloes,<sup>8,15</sup> canine viral gastroenteritis,<sup>16</sup> post-partum anestrus of dairy animals,<sup>17</sup> and non-specific diarrhea in calves<sup>18</sup> have been reported with promising results. The clinical efficacy of homeopathic combination medicine in fibrosed<sup>8,15</sup> and non-fibrosed mastitis<sup>8,15</sup> is in agreement with the earlier observations and could be ascribed to the combined anti-inflammatory response of *Phytolacca*, analgesic effect of *Bryonia*, absorptive effect of *Silica*, anti-hemorrhagic and antiseptic effect of *Arnica*, and local decongestive effect of *Ipecac* and *Calc. fluor.*<sup>19</sup> Four times daily dosing schedule was significantly ( $P < 0.01$ ) cheaper in the management of both fibrosed and non-fibrosed mastitis as it shortened the recovery period.

In cases of non-fibrosed clinical mastitis, average quarter cure rate of animals treated with antibiotics was lower (59.2%) than that (86.6%) of those treated with the homeopathic combination medicine. The cure rate with most antibiotics is approximately 60% in field conditions and with the involvement of  $\beta$ -lactamase producing organism, it becomes poorer still.<sup>3</sup> The mean recovery period in cows treated with homeopathic combination medicine was significantly ( $P < 0.01$ ) longer than the average recovery period of cows treated with antibiotics (Table 2). Nevertheless, average total cost of therapy was significantly lower with the homeopathic combination medicine than with antibiotics. Further, cows treated with homeopathy did not have the problem of milk discard owing to residues, as is the case with antibiotic-treated cows. Amongst antibiotics the clinical efficacy of a combination of cloxacillin and colistin was highest.

We conclude that the combination of *Phytolacca*, *Calc. fluor*, *Silica*, *Belladonna*, *Bryonia*, *Arnica*, *Conium* and *Ipecac* (Healwell VT-6) is effective and cost-effective in the management of fibrotic and non-fibrotic mastitis in lactating dairy cows compared to antibiotics.

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