

Original Research Article

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A Field Study on Prevalence of Subclinical Mastitis in Indigenous Kangayam Cows

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ABSTRACT

The present study was conducted to assess the prevalence of subclinical mastitis in Kangayam cows. The study was conducted in three districts of Tamil Nadu at farmer's field. For diagnosis of subclinical mastitis (SCM) in Kangayam animals California Mastitis Test (CMT) was done. An incidence of 43% of SCM was recorded in Kangayam animals out of 100 animals studied. The quarter wise prevalence showed an incidence of 20.50%. Study on the individual quarters indicated 23.17, 29.16, 20.73 and 26.82% incidence in right fore, right hind, left fore and left hind quarters, respectively. The incidence of SCM is more in adult animals (52.54%) than young animals (29.27%). The incidence was higher (56.67%) in 7 and above lactation than 4-6th lactation (45.45%) and 1-3rd lactation (29.73%). The mid lactation stage (50.00%) cows were affected more followed by early lactation (40.81%) and late lactation (36.81%) stages.

Keywords

Kangayam cows,
Subclinical mastitis,
CMT kit, Incidence,
Risk factors

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Introduction

In dairy industry, subclinical mastitis (SCM) is a more serious issue and is responsible for greater loss (Kader *et al.*, 2002). In SCM, there are no gross inflammatory changes in the udder tissue. According to Singh and Singh (1994), the loss due to SCM is three

times higher than the loss caused by clinical mastitis (CM). Further, the animals affected with SCM remain as a continuous source of infection to their herd mates. Studies have reported that the incidence of sub clinical mastitis ranged from 19.20 to 83% in cows. In India, about 70-80% economic loss has been attributed due to sub clinical mastitis alone

(Dua, 2001). Sinha *et al.*, (2014) reported an overall loss due to SCM was Rs. 1592.87 per animal per lactation in crossbred animals. The reports on the subclinical mastitis in the indigenous animals are limited due to their less population, distribution and absence of organized farms. Devi *et al.*, (1997) reported an incidence of 57.35, 75.00 and 80.00% SCM in Malvi, Sahiwal and Gir breeds in Madhya Pradesh. Kangayam breed is distributed in the farmer's field of in Tiruppur, Erode, Karur districts and also in Coimbatore, Dindugul districts of Tamil Nadu. Similar studies on the incidence of SCM in Kangayam cows are scarce. Hence the present study was conducted to document the prevalence of SCM in Kangayam cows under field conditions.

Materials and Methods

The study was conducted in 100 Kangayam cows in the farmer's field at Erode, Tiruppur and Karur Districts of Tamil Nadu. The animals were selected randomly. A total of 400 milk samples collected from 100 Kangayam cows were analysed for SCM by using California Mastitis Test (CMT kit) (Schalm and Noorlander, 1957). The study was conducted during morning milking. The plastic paddle with four shallow cups of the CMT kit was marked as left fore (LF), left hind (LH), rightfore (RF) and right hind (RH) to test the individual quarter wise incidence of SCM. The udder of the animal was washed and the first strip of milk from the udder was discarded. The next strip of the milk was collected in the respective shallow cups of the paddle. Approximately 2-3 ml of milk was taken in each cup. The equal quantity of the CMT reagent was added in each cup of the paddle without making air bubbles. It was mixed gently by circular movement in horizontal plane for 5-10 seconds. The observation was made within 30 seconds after mixing for formation of viscous gel and the

score was given. Based on the gel formation, the CMT score was given as strong positive (+++), distinct positive (++) , weak (+) and negative (Normal) as described by Lahamg *et al.*, (2019). The data regarding subclinical mastitis of each individual quarter was recorded on a data sheet.

Results and Discussion

The overall incidence and quarter wise prevalence of SCM in Kangayam animals is given in Table 1.

The overall incidence of 43% (43 out of 100 animals) of SCM was recorded in Kangayam animals under field condition in this study. The observation was in accordance with the observations made by Khanal and Pandit (2013) (46.1%) and Swami *et al.*, (2017) (35%) whereas a higher incidence was recorded by Lahamge *et al.*, (2019) (70.19%). According to Varshney and Naresh (2004), the prevalence of SCM was varying from 10-50% in cows and 5-20% in buffaloes when compared to clinical mastitis (1-10%). Payne and Wilson (1999) reported that in general the incidence of SCM in indigenous cows was lower than crossbred cows and he opined that the highest resistance in native breeds due to their genetic resistance and adaptation of these animals to native environment and climate might be the reason for the lower incidence.

The quarter wise prevalence of SCM in Kangayam cows using CMT kit showed an incidence of 20.50% (82 out of 400). In the 82 affected quarters, 19 (23.17%), 24 (29.16%), 17 (20.73%) and 22 (26.82%) were right fore, right hind, left fore and left hind quarters, respectively. The observations indicated that right side [right fore (23.17%) and right hind (29.16%)] quarters were affected more with SCM than left side [left fore (20.73%) and left hind (26.82%)] quarters. The higher incidence

of SCM in right side quarters could be due to the fact that the cows more frequently sit on the right side with the result that these quarters were exposed to dung and soil and also might be due to pressure exerted by the body of the animal on the udder (Rupakala, 2016). The current study also indicated that the hind quarters (29.16% and 26.82%) are affected more than fore quarters (23.17% and 20.73%). Singh *et al.*, (2010) observed that the incidence of subclinical mastitis was higher in hind quarters (67.92%) when compared to fore quarters (32.56%) and he opined that the higher incidence in hind quarters could be attributed to greater exposure of the hind quarters to contamination with dung and urine.

Khan and Mohammed (2005) reported 36% (72 out of 200) quarters were affected by SCM which included 14 (19.40%) right fore, 20 (27.80%) right hind, 13(18.10%) left fore and 25(34.70%) left hind quarter. In another study, Swamy *et al.*, (2019) recorded 18.25% (45 out of 240) quarters were affected which included 11 (24.44%) right fore, 13 (29.54%) right hind, 9 (20.45%) left fore and 12 (27.27%) left hind quarter. Both these studies were in accordance with the observations made in this study. In contrast to this study, Khanal and Pandit (2013) reported that SCM

was highest in left fore quarter (34.92%) followed by left hind (31.76%), right hind (28.57%) and right fore (25.39%) quarters.

The association between the various factors (age, No. of lactation and stage of lactation) on the prevalence of SCM was studied and is presented in Table 2. The results indicated that the incidence of SCM is more in adult animals (52.54%) than young animals (29.27%). Similar to this study, Barmendra *et al.*, (2011) reported that the prevalence of SCM was highest in aged group of 9-10 years (52.80%) and least in 3-4 year group (33.30%).

The observations on the number of lactation on the prevalence of SCM indicated that incidence was higher (56.67%) in 7 and above lactation followed by 4-6 lactation (45.45%) and 1-3 lactation (29.73%). Patel *et al.*, (2000) documented that prevalence of SCM was highest during 7th lactation (42.85%) and moderate during 3-5th lactation (33-36%). The gradual loss in the immune system of the body of the animal with increase in the lactation number makes the susceptibility for infection. Further the median ligaments which provide support to the teat also get relaxed with increasing age leading to hanging of udder and making it more prone to mastitis.

Table.1 Overall and quarter wise incidence of SCM in Kangayam cows

Breed	No. of animals (%)		Quarter wise affected animals in total (%)		Individual quarter wise affected (%)			
	Tested	Positive	Tested	Positive	RF	RH	LF	LH
Kangayam cow	100	43 (43.00)	400	82 (20.50)	19 (23.17)	24 (29.16)	17 (20.73)	22 (26.82)

Table.2 Association between various factors with the occurrence of SCM in Kangayam cows

Factors studied		Total animals tested	Affected animals (%)
Age	Young	41	12 (29.27)
	Adult	59	31 (52.54)
No. of Lactation	1-3	37	11 (29.73)
	4-6	33	15 (45.45)
	7 and above	30	17 (56.67)
Stage of lactation	Early	49	20 (40.81)
	Mid	32	16 (50.00)
	Late	19	7 (36.84)

(Young: <6 years and adult: >6 years; Early lactation: 1 to 60 days, mid lactation: 61 to 120 days and late lactation: >120 days)

In this study, the incidence of SCM was higher in mid lactation stage (50.00%) followed by early lactation (40.81%) and late lactation (36.81%) stages in Kangayam cows.

These observations were in accordance with the observations made by Swami *et al.*, (2017).

The risk factors such as host (breed, yield, age, parity, stage of lactation, udder confirmation, udder defense, interval between milking, somatic cell count, dry period, injuries on teat and udder, genetic resistance), microorganisms causing SCM (virulence factor and number of organisms), management practices (hygiene of farm and animal, environment, number of animals maintained, milking technique, milking machine hygiene, teat dipping), diet (copper, cobalt, zinc, selenium and vitamin E deficiency) were having some effect on the occurrence of SCM (Kumari *et al.*, 2018).

From the study it is concluded that (i). The incidence of SCM in Kangayam cows is 43.00%, (ii). The right side quarters are affected more with SCM than left side quarters, (iii). The prevalence of SCM was found more in hind quarters than fore quarters

in Kangayam cows and (iv). Age, number of lactation and stage of lactation are some of the factors have effect on the prevalence of SCM in Kangayam cows.

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