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Assessment of economic impact of babesiosis in cattle in Andhra Pradesh

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Abstract

The goal of the current study was to document the financial losses incurred by cattle infected with babesiosis between January 2023 and December 2024 in Chittore district of Andhra Pradesh, India. Throughout the course of the study, the total average financial impact resulting from babesiosis was ₹31,60,464 and the average annual loss resulting from individual cattle was ₹15,049. When comparing the different variables causing the economic loss highest percent was due to mortality loss (39.87 percent), reproductive loss (37.79 percent), production loss (8.05 percent), treatment cost (7.64 percent) and for daily wages loss (6.65 percent).

Keywords: Cattle, babesia, financial loss, production loss

Introduction

Babesiosis is a haemoprotozoan disease that is prevalent in tropical and subtropical regions, including in India which is transmitted by vectors (Salih *et al.,* 2015). It is caused by an intra-erythrocytic protozoan parasite that infects many domestic and wild animals. This disease has a significant economic impact because it results in mortality, morbidity, and a reduction in milk production. The disease causes INR 580.16 crore in losses every year in India (Narladkar, 2018). The present study was carried out to assess the economic productivity losses due to babesiosis in cattle in Chittoor district districts of Andhra Pradesh

Materials and Methods

The study was conducted on the cattle presented to the various veterinary dispensaries in and around Chittoor district districts of Andhra Pradesh for a period of two years from January 2023 to December 2024. Cattle presented with pyrexia, anaemia, tick infestation, lymphadenopathy and haemoglobinuria were included in the present study. Selection of cattle were based on history of tick infestation, haemoglobinuria, pale mucus membranes, chronic emaciation and babesiosis was confirmed by stained blood smear examination and further confirmed by polymerase chain reaction (Sivajothi *et al.,* 2023). Cattle with babesiosis were treated with specific antiparasitic drugs (Singh *et al.,* 2021) along with supportive and symptomatic therapy. Assessment of economic losses due to babesiosis was carried out in 105 cattle with babesiosis by filling questionnaire specially prepared for the study. The components under criteria were loss due to mortality, reproductive loss, production loss (Milk), treatment cost and daily wages losses.

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Results

Total number of 480 cattle were included based on the clinical signs suggestive of haemoprotozoans. Out of which, 105 cattle were confirmed for babesiosis based on the microscopic examination of stained blood smears and further confirmed by polymerase chain reaction assay, which targeted the 18s rRNA gene by creating an amplified product of 733 bp. Cattle which were positive only for babesiosis included in the present study and other haemoprotozoans and/ or mixed parasitic infections were excluded from the study. The economic loss due to babesiosis in cattle was summarized in the Tables 1and 2; Fig.1. During the study period of two years, 105 cattle with babesiosis were included and estimation of economic loss was done. Grossly economic loss was calculated into five major groups including loss due to mortality, reproductive loss, production loss (Milk), treatment cost and daily wages losses.

A) Loss due to mortality: The estimated loss due to average loss of adult cattle was ₹70,000 as per the value in the present geographical location. During the assessment period, 18 cattle died, causing an average loss of ₹12,60,000 (Range from 10,60,750 to 15,80,900).

B) Reproductive loss: The aggregative loss due to reproductive loss was ₹11,94, 500 (range from 9,75,900 to 14,08,5800). Reproductive loss was again divided into loss due to abortions, increased calving interval

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and infertility issues in cattle with babesiosis. (B1)- Loss due to abortions: Abortions resulted in the loss of five male calves (each valued at ₹1,000) and 11 female calves (each worth ₹5,000) amounting to loss of ₹60,000 (Range from 55, 000 to 75,000). (B2) - Loss due to increased calving interval: 55 cows had increased calving interval. Delayed calving resulted in a loss of ₹ 10,39,500 (Range from 8,40,900 to 12,90,800). (6 months delay, 3liters/day loss for 180 days at ₹ 35/liter). (B3)- Loss due to infertility: 19 cattle had infertility and did not become pregnant even after fourth time of insemination. Infertility led to loss of ₹95,000 in (Range from 80,000 to 1,20,000) (₹5000/year per affected cow).

C) Production loss (milk loss): 71 cows had reduction in mild yield. The average reduction in milk yield per animal per day was 5.12 litre; the average milk loss period was 20 days; the average cost of one litre of milk was ₹35. The estimated economic loss due to average milk loss was ₹2,54,464 (Range from 2,35, 200 to 2, 89, 200).

D) Treatment cost: 105 cows were treated and the average expenditure for treatment of sick cattle (specific therapy ₹500; symptomatic therapy ₹600; supportive therapy ₹1200) was ₹2300. The estimated economic loss due to treatment cost was ₹2,41,500 (Range from 2,10,000to 2,78,000).

E) Daily wages loss: 105 farmers lost their working time to spend the for the treatment of cattle and the average loss was ₹2000; The estimated economic loss due to daily wages loss of ₹2,10,000 (Range from 1,56,700 to 2,59, 200).

Total loss: The cumulative financial impact due to babesiosis in cattle was ₹31,60,464 (Range from 26, 29,550 to 38, 93, 100) during the two years period of study in 105 cattle. An average loss due to individual cattle per year was ₹15,049.

In the present study average economic loss was estimated for 105 cattle with babesiosis during two years period and it was ₹31,60,464, out which the loss due to mortality was 12,60,000 (39.87%), productive loss was 11,94,500 (37.79%), production loss by milk was 2,54,464 (8.05%), treatment cost was 2,41,500 (7.64%), daily wages were 2,10,000 (6.65%). (Table-21, Figure-14, Plate 5). When comparing the different variables causing the economic loss highest percent was due to mortality loss (39.87%), reproductive loss (37.79%), production loss (8.05%), treatment cost (7.64%) and for daily wages loss (6.65%).

DISCUSSION

According to Laha *et al.* (2012), babesiosis caused an average daily milk loss of 1.72 liters. However, over the course of 20 days, the average milk yield loss in this study was 5.12 liters per day. According to Banerjee *et al.* (2005), after 18 days of starting treatment, cows will continue to produce milk. According to a study, the estimated annual loss from tick-borne diseases (TBD) was 364 million USD, with the loss of milk production accounting for 6% of this total (Kiveria, 2006). Given the lack of reports of financial losses resulting from natural *Babesia* infection in Indian crossbred cows, this estimate will be useful to farmers.

A study on the financial impacts of nematode, trematode, and tick parasitism on beef cattle production was carried out by Strydom *et al*. (2023). They came to the conclusion that live weight, feed efficiency, calf yield, quality, and reproductive performance are all adversely affected by parasitic infections in beef cattle. In addition to being a primary reason for carcass condemnations, these infections may be a factor in the increase in greenhouse gas emissions. The quantity of meat available to satisfy the demands of an expanding population can be decreased by such production losses, which can be significant. A study on financial losses resulting from the foot and mouth disease outbreak in cattle in certain impacted areas of Bangladesh was carried out by Giasuddin *et al.* in 2021. They discovered that the largest percentage of losses occurred when the affected cattle died (63.47%), followed by veterinary expenses (10.71%), the weight loss of the fattening cattle (10.68%), the decrease in milk production (9.17%), and the loss of labor for caring for the affected cattle (5.98%).

Over the course of the two-year study period, the total financial impact of babesiosis in these 105 cattle comes to ₹31,60,464. Over the course of the study, the average annual loss resulting from individual cattle was ₹15,049. The loss was ₹12,60,000 (39.87%) from mortality, ₹11,94,500 (37.79%) from productive loss (abortions, abnormal calving interval, infertility loss), ₹2,54,464 (8.05%) from milk production loss, ₹2,41,500 (7.64%) from treatment costs (specific, symptomatic and supportive therapy) and ₹2,10,000 (6.65%) from daily wages. During the study period, the average annual economic loss resulting from babesiosis in cattle was ₹15,049; this amount was made up of 39.87 percent from mortality loss, 37.79 percent from reproductive loss, 8.05 percent from milk loss and 7.64 percent from treatment cost.

Table 1: Assessment of economic loss due to babesiosis in cattle (105)

1.	Loss due to mortality	₹ 70,000 per cattle	70,000	18	12,60,000	10,60,750 to 15,80,900
2.	Reproductive loss				11,94,500	9,75,900 to 14,08,5800
	A) Abortions	Male calf- ₹ 1000 Female calf- ₹ 5000	Male calf- 1000 Female calf- 5000	16	60,000	55,000 to 75,000
	B) Calving interval	6 months increased, additional milk loss=3L×180D×35Rs	18900	55	10,39,500	8,40,900 to 12,90,800
	C) Infertility loss	calf a year (as per)	5000	19	95,000	80,000 to 12,0000
3.	Production loss (milk)	5.12ltr×20days×35Rs/L	3584	71	2,54,464	2,35,200 to 2,89,200
4.	Treatment cost	Specific therapy (₹ 500) Symptomatic therapy (₹ 600) Supportive therapy (₹ 1200)	2300	105	2,41,500	2,10,000 to 2,78,000
5.	Daily wages loss		2000	105	2,10,000	1,56,700 to 2,59,200
	Total				31,60,464	26,29,550 to 38,93,100

Table 2: Percentage of different variables causing economic loss

S. No	Parameters	Total loss (₹)	Total economic loss in percentage (%)
1.	Loss due to Mortality	12,60,000	39.87
2.	Reproductive loss	11,94,500	37.79
3.	Production loss (milk)	2,54,464	8.05
4.	Treatment cost	2,41,500	7.64
5.	Daily wages loss	2,10,000	6.65
		31,60,464	100.00

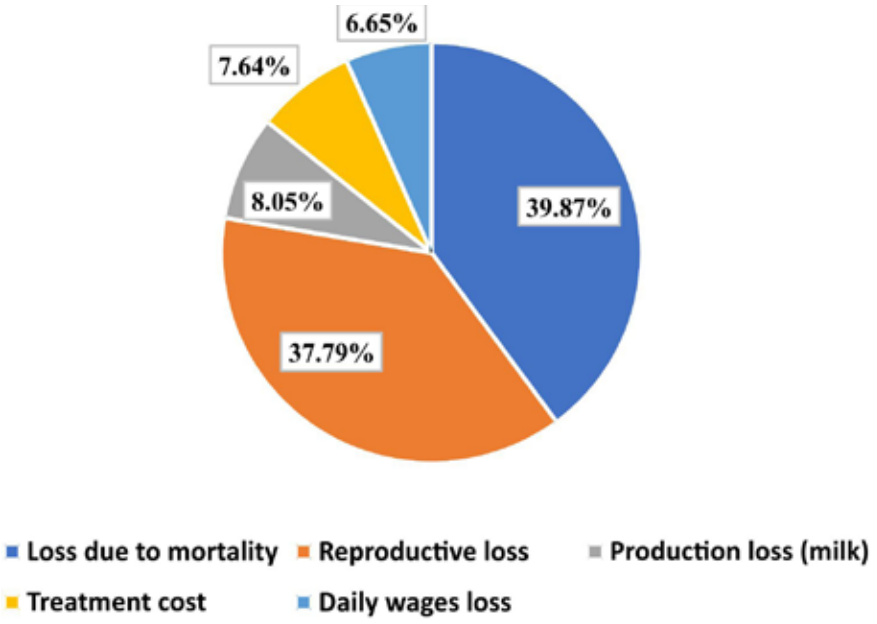

Figure 1: Percentage of different variables causing economic loss.

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References

Banerjee PS, Dabas S, Vatsya S, Bhatt P and Yadav CL 2005 Babesiosis in a crossbred cow with clumping of parasitized red blood cells. *J. Vet. Parasitol*., **19:**153-154.

Giasuddin M, Ali MZ, Sayeed MA and Islam E 2021 Financial loss due to foot and mouth disease outbreak in cattle in some affected areas of Bangladesh. *Bangladesh J. Livestock Res.,* 82-94.

Kiveria FM 2006 Estimated direct economic costs associated with tick-borne diseases on cattle in Tanzania. *Tropical Animal Health Production,* 38: 291-299.

Laha R, Das M, Goswami A and Singh P 2012 Losses of milk production due to Babesia bigemina infection in a cross bred cow: A case study. *J. Protozool. Res.,* 22(1-2): 6-9.

Narladkar BW 2018 Projected economic losses due to vector and vector-borne parasitic diseases in livestock of India and its significance in implementing the concept of integrated practices for vector management. Veterinary World, 11(2): 151-160.

Salih DA, El Hussein AM and Singla LD 2015 Diagnostic approaches for tick-borne haemoparasitic diseases in livestock. Journal of Veterinary Medicine and Animal Health. 7(2): 45-56.

Singh AP, Tripathi AK, Pandey RP and Ashish S 2021 Therpeutic efficacy evaluation of commonly used antitrypanosomal drugs in naturally infected buffaloes. Buffalo Bulletin. 40 (1): 19-30.

Sivajothi S, Reddy BS and Swetha K 2023 Cerebrospinal fluid analysis and haemato-biochemical variations in young buffalo calves with cerebral babesiosis. Journal of Parasitic Diseases. 47(4): 815-819.

Strydom T, Lavan RP, Torres S and Heaney K 2023 The economic impact of parasitism from nematodes, trematodes and ticks on beef cattle production. Animals. 13(10): 1599.

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