

ECONOMIC LOSSES DUE TO HIGH INCIDENCE OF BLACK QUARTER DISEASE IN CATTLE AND BUFFALOES AND ITS TREATMENT IN DISTRICT DERA ISMAIL KHAN

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ABSTRACT: The main objectives of this study were to find out epidemiological factors and economical losses related to black leg (Black quarter disease) in cattle and buffaloes in D. I. Khan and to compare the efficiency of treatment trials as two broad spectrum antibiotics e.g amoxicillin and oxytetracycline against black leg under field conditions. The survey results showed that 15.91% economic losses were occurred due to morbidity and 84.09% due to mortality caused by black quarter in cattle and buffaloes. Severity and recovery was checked and assessed before treatment. Treatment trials indicated oxytetracycline (clamoxyl L.A., 15 mg per kg body weight) and amoxicilline both proved 95% effective.

Key words: Economic losses, black quarter, cattle and buffaloes, treatment trials. D. I. Khan.

INTRODUCTION

Cattle and buffaloes are the most important part of livestock population, but these are badly affected with many infectious diseases which reduce the population and production of these animals and make them useless as well as uneconomical for the farmers (Alwis, 1988; Burgdorfer *et al.*, 1985). These diseases are major veterinary problem in developing and underdeveloped countries. Black leg is an acute infectious disease caused by *Clostridium chauvoei* (Prime cause of the disease), rod shape organism, 0.6 μ in diameter, 8 μ in length, gram positive, motile, non-capsulated, anaerobic, spore forming bacterium, optimum temperature for growth is 37 °C. The organism grows best in slightly alkaline media. On agar plates the organism forms a small, irregular colony, effuse, transparent finally granular in the centre, but becoming invisible towards the periphery. Black leg (which is also called black quarter/gangrenous emphysema) is one of the major bacterial infectious diseases (Sultana *et al.*, 2008). Pakistan is also facing the problem of black quarter as a major disease of cattle and buffaloes resulting in irrecoverable substantial loss. The disease prevails in all provinces of Pakistan. Dera Ismail Khan comprises an area of 2214416 acres (mostly un-irrigated), 750000 human population and 200 villages. Dera Ismail Khan has 319274 cattle and buffaloes. In District Dera Ismail Khan, black quarter diseases prevails in cattle and buffaloes causes heavy economic losses every year (Rahman *et al.*, 2009). Black leg is a soil borne disease chiefly affecting cattle and buffaloes of young age. (i.e from six months to tow years). The disease is infectious in nature and out breaks are usually after rains. The out breaks can be controlled by routine vaccination (Reddy *et al.*, 1997). The present study was therefore planned to prepare a clear picture about the

incidence and severity of black leg in Dera Ismail Khan District and to find out their relationship with other factors like breed, availability of clinical assistance, management conditions and age etc. The information obtained from this study will also be helpful to improve the economics of farmers and may open new avenues of research for the eradication and control of this disease.

MATERIALS AND METHODS

An active surveillance was conducted to study the epidemiology and economic losses occurring due to black quarter disease in cattle and buffaloes in Dera Ismail Khan District of Khyber Pakhtunkhwa in year 2009. The data for epidemiology was collected from 20 randomly selected villages from all three tehsils of D.I.Khan Districts. Ten villages were selected from irrigated area and ten villages from un-irrigated area. Villages selected from irrigated area were i. Paharpur ii Budh iii Malana iv Kla Gore v. Said Allian vi. Kotjai vii. Mandra Kalan viii. Diyal ix. Kukar and x. Korai. From non-irrigated area villages selected were i. Rori, ii. Jehangir abad iii. Aslam abad. iv. Kulachi v. Maddi vi. Kot isa khel vii. Ranwal viii. Pai ix. Mamraiz and x. Gara Hayat. The study was conducted for a period of one year i.e from August, 2008 to July, 2009 and survey was completed in 3 months. On thousand farmers available during the collection for the data were interviewed individually. The information thus collected were carefully recorded on the questionnaire and used separately for each farmer. The data was then compiled for each village area (irrigated and non-irrigated) and district respectively. The questions were asked according to the following pattern from each farmer by separate mentioning of age and sex group of animal i.e young male, young female, adult male and adult female. Species

of animals (i.e cattle, buffaloes) available with farmers were also recorded (Blood *et al.*, 1989). The data collected was subjected to statistical analysis and the incidence, mortality and the cases of fertility rates were calculated as follows:

$$\text{Incidence \%} = \frac{\text{Total number of animals affected}}{\text{Total number of animals}} \times 100$$

$$\text{Mortality \%} = \frac{\text{Number of animals died}}{\text{Total number of animals}} \times 100$$

$$\text{Case fatality \%} = \frac{\text{Number of animals died}}{\text{Number of animal affected}} \times 100$$

$$\text{Economic losses \%} = \frac{\text{Economic loss to a disease (Black Leg)}}{\text{Total loss due to various diseases}} \times 100$$

During the survey period some out breaks were also attended and some positive cases were treated with amoxicillin and oxytetracycline. Symptoms observed in each animal were carefully recorded in proforma designed. 60 animals suffering from black quarter were randomly selected from various villages. Animals

selected for treatment trials were divided randomly into three groups of 20 animals each. Animal of group A were treated with intramuscular injection of amoxicillin (becham) (containing amoxicillin trihydrate 15%) at the dosage rate of 15 mg per kg body weight. Animals of group B were treated with intramuscular injection of oxytetracycline “Pfizer” (containing oxytetracycline 20%, “ 200 mg/ml” at the dose rate of 20 mg/kg. Animals of groups C were kept as control and were left untreated (Reddy and Srinivasan., 1997).

RESULTS AND DISCUSSION

An active surveillance was conducted and epidemiology and economic losses of black quarter disease in cattle and buffaloes in District Dera Ismail Khan were estimated (Blood and Rodostits, 1989). Economic losses were estimated by grading into morbidity losses and mortality losses. Morbidity losses comprise of losses due to reduced milk production, work hindrance, treatment charges etc (Enright *et al.*, 1971). Economic losses due to black quarter disease in cattle and buffaloes (combined) are shown in Table 1 and the same reflected graphically in Figure 1.

Table 1. Economic losses (morbidity and mortility) due to black quarter disease in cattle and buffalo in D.I.Khan District

| Kinds of loss | No. of Cattle | | No. of Buffalo | | Total | Percentage |
|----------------|---------------|--------|----------------|--------|---------|------------|
| | Young | Adult | Young | Adult | | |
| Morbidity loss | 52800 | 52400 | 36950 | 35570 | 177720 | 15.91% |
| Mortality loss | 291750 | 493000 | 73450 | 81200 | 939400 | 84.09% |
| Total | 344550 | 545400 | 110400 | 116770 | 1117120 | 100.00% |

Source: Survey data, D.I.Khan District.

The survey revealed that 15.91% losses were due to morbidity and 84.09% losses occurred due to mortality caused by black quarter in cattle and buffaloes. The study revealed 344550 as total economic losses in young cattle, 545400 in adult cattle, 110400 in young buffaloes and 116770 in adult buffaloes. Morbidity losses in young and adult cattle buffaloes were 52800 and 52400 respectively. Mortality losses due to black leg in cattle were estimated 291750 in young and 493000 in adult cattle respectively (Buddle, 1954). Mortality losses estimated in buffaloes were 73450 and 81200 in young and adult buffaloes respectively.

According to the results revealed in Table 2, 11.82% losses were due to morbidity and 88.18% due to mortality in cattle. From another point of view, the study revealed 168000, 36000 morbidity losses in young male and female cattle respectively. While morbidity losses in male and female adult were recorded as 13400 and 39000 respectively. Whereas mortality losses in young male,

adult male, young female and adult female were 2300, 37400, 268750 and 469000 respectively.

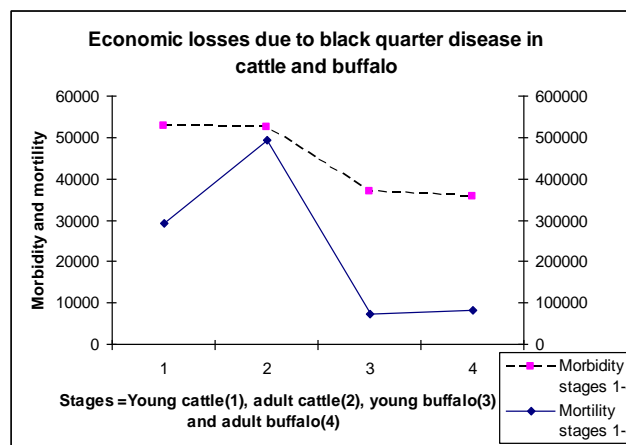


Figure 1: Economic losses due to black quarter disease in cattle and buffalo in D. I. Khan.

Table 2. Economic losses due to black quarter in cattle

| Kinds of loss | No. of Male | | No. of Female | | Total | Percentage |
|----------------|-------------|-------|---------------|--------|--------|------------|
| | Young | Adult | Young | Adult | | |
| Morbidity loss | 168000 | 13400 | 36000 | 39000 | 105200 | 11.82% |
| Mortality loss | 23000 | 24000 | 268750 | 469000 | 784750 | 88.18% |
| Total | 39800 | 37400 | 304750 | 508000 | 889950 | 100.00% |

Source: Survey data, D.I.Khan District.

Table 3: Economic losses due to black quarter in buffaloes

| Kinds of loss | No. of Male | | Female | | Total | Percentage |
|----------------|-------------|-------|--------|--------|--------|------------|
| | Young | Adult | Young | Adult | | |
| Morbidity loss | 8950 | 4370 | 28000 | 31200 | 72520 | 31.92% |
| Mortality loss | 27450 | 9400 | 46000 | 71800 | 154650 | 68.08% |
| Total | 36400 | 13770 | 74000 | 103000 | 227170 | 100.00% |

Source: Survey data, D.I.Khan District.

According to the results mentioned in Table 3 as 31.92% are morbidity losses and 68.08% mortality losses. These results, if seen from another aspect, reveal that 8950, 43370, 2800 and 31200 morbidity losses occurred in young male, adult male, young female and adult female buffalo respectively. Mortality losses in young male, adult male, young female and adult female buffalo were estimated 27450, 9400, 74000 and 71800 respectively.

Treatment trials of oxytetracycline (Terramycine L.A Pfizer, 20 mg/kg) and amoxicilline (Clamoxyl L.A., Beecham, 15 mg/kg) were also conducted during the study. Severity and recovery was monitored before treatment and 6th, 12th, 24th, 48th, 72nd hours after treatment. Most common symptoms observed were lameness, high rate of temperature swelling hot painful initially and cold, senseless in later stages. Crepitating sounds on pressing the swelling and death within 12-45 hours treatment trials indicated that oxytetracycline and amoxicilline both proved 95% effective similar results were also reported by (Myllys *et al.*, 1995; Rajalakshmi *et al.*, 2010).

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