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# BABESIOSIS IN CROSS-BRED CATTLE (*BOS INDICUS* x *BOS TAURUS* AND BUFFALOES (*BUBALUS BUBALIS*)

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**Abstract**: Babesiosis (Redwater), a tick borne protozoal disease, poses a great threat to cows and buffaloes. It was recorded from different districts of Punjab *i.e.* Lahore, Kasur, Jhang, Faisalabad and Gujrat. The surveys revealed many animals to be infected with *Babesia begemina*. These infected animals showed pyrexia, loss of appetite, dysponoea, haemoglobinurea and decrease in the milk yield. Animals responded to treatment with Diminazine 20-30 ml, Berenil 1.05 gm/12 ml distilled water and Imizol (Imidocarb) 1ml/100kg body wieght.

**Key words**: Babesiosis, cross bred cattle, buffaloes.

## INTRODUCTION

Babesiosis is a debilitating, and often fatal disease of cattle. In Pakistan all breeds, *i.e.* the local breed (*Bos indicus*) as well as the exotic breed (*Bos taurus*) and crossbred (*Bos indicus* x *Bos taurus*) are vulnerable to it. Cross breds have anhanced susceptibility to infectious diseases, especially to babesiosis (Smith and Kilbourne, 1893; Ashfaque *et al.*, 1983; Mottelib *et al.*,1992). Buffaloes have also been reported to suffer from babesiosis (Lieu, 1986).

The organism that caused this disease is a protozoan parasite belonging to the genus *Babesia*. *B. bigemina* causes clinical disease in cattle and buffaloes. Most animals that are susceptible to the disease die from infection if not treated.

The present data represents part of a larger study comprising survey of out breaks of babesiosis, among other tick-borne cattle diseases in different parts of Punjab, assessment of damage and work along remedial lines has also been carried out.

## MATERIALS AND METHODS

A survey for the presence of babesiosis in cattle and buffaloes was carried out in Lahore, Kasur, Jhang, Faisalabad and Gujrat districts. Blood samples of the infected animals were taken at the spot and stained with Geimsas' stain. Other haematological studies were carried out using the standard techniques of Schalm *et al.* (1975). All sixty four animals were found to be suffering from babesiosis during the different surveys carried out.

Diminazine (Star) 20-30 ml, Berenil (Hoechest) 1.05 g/12ml distilled water, and Imizol (ICI) Imidocarbdipropionate 1ml/100kg (i/m) were used for treatment. B-complex 10 ml (i/m) was injected five times, once on every alternate day.

## RESULTS

Seven out of 15 cross-bred cows showed rise in temperature to 105 °F within one month *i.e.* middle of July to middle of August. Treatment with antibiotics like Oxytetracycline and Gentamycine brought no response. Cows also showed the symptoms of haemoglobinurea. Examination of blood smears during febrile stage revealed *B. bigemina*. Diminazine injection of the infected animals resulted in a positive response and to normalcy. *Boophilus microplus* were the vector ticks. Buffaloes showed rise in temperature, loss of appetite, haemoglobinurea. There was a significant decrease in milk yield. These cases were observed in different districts of Punjab and were treated with Diminazine, Berenil and Imizol successfully, (see, Table I). Buffaloes were also infected with another species *B. microplus*. After the treatment a complete cure occured and almost all the animals became normal in milk yield within 4 weeks.

**Table I. Cases of babesiosis recorded in cattle and buffaloes at private farms and clinics.**

| Source | Species | Affected cases | Animals cured | Deaths due to disease | Drugs used |
|---|---|---|---|---|---|
| Khalid Dairy Farm, Burki, Dist. Lahore | Cross cows | 7 | 6 | 1 | Diminazine |
| Dist. Lahore | Buffaloes | 15 | 13 | 2 | Imizol |
| Dist. Lahore | Cows | 5 | 5 | - | Berenil |
| Dist. Kasur | Buffaloes | 12 | 10 | 2 | Diminazine |
| Dist. Jhang | Buffaloes | 9 | 8 | 1 | Berenil |
| Dist. Faisalabad | Buffaloes | 12 | 10 | 2 | Diminazine, Imizol |
| Dist. Gujrat | Buffaloes | 4 | 4 | - | Berenil |

Haematological examination revealed decrease in packed cell volume (PCV), total erythrocytic count (TEC), haemoglobin (Hb), total leukocytic count (TLC; Table II).

**Table II** **Haematological profile of healthy and clinical babesiosis positive cases (2 cattle and 4 buffaloes) of each group.**

| Parameters | Healthy animals | Diseased animals |
|---|---|---|
| PCV (%) | 30.00±0.50 | 15.60±1.25 |
| Hb (g%) | 11.00±0.90 | 5.93±0.30 |
| TEC ($10^6$/cmm) | 6.30±0.77 | 3.50±0.11 |
| TLC ($10^3$/cmm) | 7.93±0.16 | 1.42±0.08 |
| Neutrophils (%) | 32.6±2.33 | 50.30±3.32 |
| Eosinophils(%) | 6.10±1.38 | 3.0±1.54 |
| Basophils (%) | 0 | 0 |
| Lymphocytes (%) | 54.30±2.33 | 42.00±3.03 |
| Monocytes (%) | 6.50±1.04 | 1.60±1.36 |

## DISCUSSION

Besides causing physical damage, the tick *B. microplus* is also responsible for the transmission of babesiosis in cattle and buffaloes in India and Pakistan. Dwivedi *et al.* (1979), Roychoudhry and Cautam (1980), Sanshez (1984), Rao *et al.* (1986) and others have aslo recorded the same results. *Babesia bigemina* are present in the red blood cells during the febrile stage of disease in the form of round or pear shaped bodies 2-4$\mu$m long by 1 to 2$\mu$m wide (Blood and Radostits, 1989).

Incidence of babesiosis was higher in the rainy season. It was mainly due to the increase of population of the ticks, although sporadic cases were aslo found throughout the year. These findings are in line with Mallick *et al.* (1983), James *et al.* (1985), Ouhelli (1985), Cooper (1989).

Haematological results revealed haemolytic anemia in diseased animals. The leukocytosis with neutrophilia was due to stress of acute babesiosis. Similar results were observed by Rogers (1971), Panday and Misra (1987), Bansal *et al.* (1990), Mottelib *et al.* (1992). Deaths occured due to the inadequate clinical management of haemolytic anaemia.

Subclinical cases in cows and buffaloes showed red water symptoms for one or two days and then self recovery was observed due to the acquired immunity which is also a character of *B. bigemina i.e.* it may occur in mild form as previously reported (Mahony, 1977). A number of drugs exist for the treatment of babesiosis. Imizol, Diminazine and Berenil were tried in cattle and buffaloes and gave good results as

obtained before by other workers (Karimov and Gafurov, 1984; Hashmi and Sharki, 1991; Irwin and Hutchison, 1991).

## REFERENCES

ASHFAQUE, M., AJMAL, M., AND AHMAD, S., 1983. An out break of theileriosis in cross-bred calves. *Pakistan Vet. J.*, **3**: 44-46.

BLOOD, D.C., RADOSTITS, M., 1989. *Veterinary Medicine*, 7th Ed. pp. 984-991.

BANSAL, S.R., KHAROLE, M.U. AND BANERJEE, D.P., 1990. Clinicopathological studies in experimental *Babesia canis* infection. *J. Vet. Parasitol.*, **4**: 21-25.

COOPER, P.E. AND WATSON, P.M., 1989. Red water treatment. *Vet. Rec.* **124**: 643.

DWIVDI, S.K., MALLICK, K.P., MALHOTRA, M., 1979. Clinical cases in Indian water buffaloes. *Indian Vet. J.*, **56**: 333-335.

HASHEMI, F.F. AND SHARKI, R., 1991. Ovine and caprine babesiosis in Iran. Treatment with imidocarb. *Vet. Rec.*, **129**: 383-384.

IRWIN, P.J., HUTCHINSON, G.W., 1991. Clinical and pathological findigs of Babesia infection. *Australian Vet. J.*, **68**: 204-209.

JAMES, M.A., CORONADO, A., LOPEZ, W., MELENDEZ, R. AND RISTIC, M., 1985. Seropathology of bovine babesiosis in Venezuela. *Trop. Anim. Hlth. Prod.*, **17**: 9-18.

KARIMOV, B.A., GAFUROV, A.G., 1984. Therapeutic efficacy of Imizol (Imidocarb) against Piroplasmosis in cattle. *Trudy Vesesoyu Znogo Institute Eksperimental Noi Veterinarit.* **60**: 67-70.

LIEU, Z.L., ZHANG, G.D., MA, L.H., HUANG, J.S., CHEN, X.J., GAO, X.S., YANG, D.J., 1986. Investigation of babesiosis in buffaloes in Dubai Province. *Acta Veterinaria et Zootechnica Sinica*, **17**: 49-54.

MAHONEY, D.F., 1977. Babesia of domestic animals In: *Parasistic Protozoa*, Vol. IV, ed. J.P. Kreier, pp. 1-52. Academic Press, New York.

MALLICK, K.P., DWIVEDI, S.K. AND MALHOTRA, M.N., 1983. Babesiosis in Indian buffaloes: a note on clinico-epidemiological study, *Indian Vet. Med. J.*, **7**: 49-50.

MOTTELIB, A.A., HAROUN, E.M., ABDEL HAMID, Y.M., MAHMOUD, O.M., 1992. Clinical, haematological studies on Piroplasmosis in calves at Al Gassim *Assiut Vet. Med. J.* **28**: 224-232.

OUHELLI, H., PANDEY, V.S. AND BENZAQOUI, T., 1985. Seasonal variation of cattle ticks in a subhumid area of Morocco. *Bull. Anim. Hlth. Prod. Africa.*, **33**: 207-210.

PANDAY, N.N. AND MISRA, S.K., 1987. Haematological and biochemical response to haemolytic anaemia of clinical babesiosis in cattle and therapy. *Indian Vet. J.*, **64**: 882-886.

RAO, P.B., RAMANATHAN, R. AND KARKHANI, R.S., 1986. Haemoprotozoan infection in animals of Andhra Pardesh Live Stock Advisor II, **2**: 34-38.

ROYCHOUDHURY, G.K. AND GAUTAM, O.P., 1980. Studies on some aspects of *B. bigemina* infection with special reference to clinical studies and treatment. In haemoprotozoan diseases of domestic animals (Pro Seminar Cw Va Asian region. Haryana Agric. Univ. Hisar, India. October 27 to November 1st, *pp.* 107-113

SANCHEZ, F.L., CANTO ALARCON, G.J., NERI, A.F., AND TORRES, A.T., 1984. Prevalence of babesiosis at experimental live stock centre of Asdama, *Mexico Tecnica Paeuaria en Mexico*, **46**: 88-92

SCHALM, O.W., JAIN, N.C. AND CARROLL, 1975. *Veterinary Haematology*, 3rd Ed. Leafebiger Philadelphia. *pp*. 82-218.

SMITH, T., AND KILBORNE, F.L., 1893. *Investigation into nature, causation and prevention of Texas cattle fever*. Bulletin No. 1. BAI., U.S. Deptt. of Agriculture.

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