



Original Research

Haematological Changes in Bubaline Brucellosis in Malwa Region of Madhya Pradesh

Sachin Verma, G. P. Jatav*, Supriya Shukla, A. K. Jayraw¹, S. D. Audarya², Rashmi Yadav and Vivek Agrawal³

Department of Veterinary Pathology, College of Veterinary Science & Animal Husbandry, Mhow, Madhya Pradesh, INDIA

¹Department of Veterinary Parasitology

²Department of Veterinary Microbiology

³Department of Veterinary Parasitology

*Corresponding author: drgpjatavpath@gmail.com

Rec. Date:	Nov 14, 2018 06:33
Accept Date:	Feb 07, 2019 14:18
DOI	10.5455/ijlr.20181114063329

Abstract

Brucellosis is the widely prevalent disease throughout India causing economic losses to the tune of Rs. 350 million. The current status of bovine brucellosis in India is not clear. However, the incidence of the disease is increasing in all the states of the country. Scanty literature is available on bubaline brucellosis from Malwa region of Madhya Pradesh, therefore study was conducted to analyse the haematological changes in infected animals. Samples were collected from 150 buffaloes (both lactating and non-lactating) from slaughter house and nearby areas of Mhow and Indore. Out of 150 serum samples, 20 serum samples were found positive for Rose Bengal Plate Test (RBPT). Out of 18 milk samples, 7 milk samples were found positive for Milk Ring Test (MRT) and 10 samples found positive for California mastitis test (CMT). Haematological studies revealed decrease in neutrophil, monocyte, eosinophil, lymphocyte and total erythrocyte counts in RBPT positive while increase in haemoglobin, packed cell volume and total erythrocyte count in MRT and CMT positive animals.

Key words: Brucellosis, Buffaloes, CMT, Hematological Changes, MRT, RBPT

How to cite: Verma, S., Jatav, G., Shukla, S., Jayraw, A., Audarya, S., Yadav, R., & Agrawal, V. (2019). Haematological Changes in Bubaline Brucellosis in Malwa Region of Madhya Pradesh. International Journal of Livestock Research, 9(4), 134-137. doi: 10.5455/ijlr.20181114063329

Introduction

Brucellosis is one of the five main notifiable bacterial diseases of zoonotic importance in the world. Mild hematologic abnormalities, such as anaemia and leukopenia, are common in the course of human brucellosis (Crossby *et al.*, 1984). Therefore, present study was conducted to analyse the haematological changes in infected buffaloes.



Material and Methods

The present study was conducted in the Department of Veterinary Pathology, College of Veterinary Science and Animal Husbandry, Mhow (M. P). Whole blood (n=150), serum (n=150) and milk (n=18) samples were collected from buffaloes (both lactating and non-lactating) from Cantonment Board, Mhow, slaughter house and nearby areas of Mhow and Indore. Serum and milk samples were subjected to Rose Bengal Plate Test (RBPT) and Milk Ring Test (MRT), respectively to detect anti-*Brucella* antibodies as per standard protocol described by OIE (2012). The milk samples were also tested for California Mastitis Test (Schalm *et al.*, 1971). The haematological parameters like total leucocyte count (TLC), differential leukocyte count (DLC), total erythrocyte count, haemoglobin concentration and packed cell volume were carried out as per standard procedures described by Wills *et al.* (2010). The blood smears were stained with Wright Stain (modified Wright's stain), following the method described by Wills *et al.* (2010) with slight modification. Mean values of different haematological parameters are presented in the present investigation.

Results

In the present study, out of 150 serum samples of buffaloes, 20 serum samples were found positive for RBPT. Out of 18 buffalo milk samples, 7 milk samples were found positive for MRT and their hematological values (Mean \pm S.E.) shown in Table 1. Out of 18 buffalo milk samples, 10 milk samples were found positive for CMT and their haematological values (Mean \pm S.E.) are shown in Table 1.

Table 1: Haematological values (Mean \pm S.E.) for RBPT, MRT and CMT positive buffaloes

Parameter	RBPT(+ve)	MRT(+ve)	CMT(+ve)	
	(n=20)	(n=7)	(n=10)	
TLC (thousand/mm ³)	8.327 \pm 9.049	8.457 \pm 1.588	8.575 \pm 1.150	
Neutrophils	35.500 \pm 2.259	50.425 \pm 4.540	44.200 \pm 4.637	
Lymphocytes	56.750 \pm 3.087	43.148 \pm 3.835	48.800 \pm 3.969	
DLC	3.150 \pm 0.736	4.574 \pm 3.256	5.100 \pm 2.465	
(%)	Eosinophils	1.600 \pm 0.297	1.851 \pm 0.340	1.900 \pm 0.547
	Basophils	0	0	0
TEC (million/ μ l)	6.740 \pm 0.234	6.787 \pm 0.664	5.800 \pm 0.301	
Hb (gram/dl)	13.625 \pm 0.479	12.712 \pm 1.447	11.000 \pm 0.534	
PCV (%)	40.800 \pm 1.414	40.712 \pm 3.974	34.800 \pm 1.857	

Discussion

In the present study, the haematology of 20 blood samples of RBPT positive buffaloes was performed the haematological values were recorded as total leucocyte count (TLC) and lymphocytic count was found in the normal range, whereas neutrophil, monocyte, eosinophil and total erythrocyte count (TEC) decreased with slight increase in haemoglobin (Hb) and packed cell volume (PCV). Findings of the present study are

in line with the findings of Crosby *et al.* (1984) with neutropenia whereas in contrast with their other findings like leukopenia and lymphopenia, Hussain *et al.* (2012) recorded higher neutrophil population, Sikder *et al.* (2012) with slight diminution in total erythrocyte count (TEC), whereas values of total leucocyte count (TLC), monocyte and eosinophils were increased which was not observed in the present investigation. The MRT positive haematological values for buffaloes indicated slight increase in neutrophil, haemoglobin (Hb) and packed cell volume (PCV) with decrease in eosinophils, lymphocyte and total erythrocyte count (TEC). Findings of the present study match with the findings of Crosby *et al.* (1984) for leukopenia, Hussain *et al.* (2012) for neutrophil population and Sikder *et al.* (2012) for total erythrocyte count (TEC) and contrast with the findings of Crosby *et al.* (1984) for neutropenia, and anemia and Sikder *et al.* (2012) for neutrophil and eosinophils counts.

Haematology of CMT positive buffaloes showed slight increase in the values of total leucocyte count (TLC), neutrophil and monocyte whereas the diminution in lymphocyte, eosinophils and total erythrocyte count (TEC) with normal haemoglobin (Hb) and packed cell volume (PCV). Findings of the current study are in consonance with the findings of Hussain *et al.* (2012) for neutrophils, Sikder *et al.* (2012) for total erythrocyte count (TEC) and Crosby *et al.* (1984) for leukopenia whereas findings of the present investigation are in contrast with the findings of Sikder *et al.* (2012) for neutrophil, eosinophil and total leucocyte count (TLC).

Conclusion

In the present study, overall values of neutrophil, monocyte, eosinophil, lymphocyte and total erythrocyte count were decreased in case of RBPT positive buffaloes whereas, increase in values of haemoglobin, packed cell volume and total leucocyte count was recorded in MRT and CMT positive buffaloes.

Acknowledgment

The authors are highly thankful to Head of Institute (Dean) college of veterinary science and animal husbandry, Mhow and NDVSU, Jabalpur for supporting this study.

References

1. Beytut, E., Sahin, M., Erginoy, S. and Sozmen, M. (2009). Pathological, immunohistochemical and bacteriological findings in the mammary glands and supramammary lymph nodes of cows with a history of abortion due to *Brucella abortus*. *Turkish Journal of Veterinary and Animal Sciences*, 33: 37-43.
2. Crosby, E., Llosa, L., Miro Quesada, M., Carrillo, C. and Gotuzzo, E. (1984). Hematologic changes in brucellosis. *Journal of Infected Disease*, 150 (3): 419-24.
3. Hussain, R., Javed, M.T., Khan, A., Mahmood, F. and Kausar, R. (2012). Mastitis and associated histopathological consequences in the context of udder morphology. *International Journal of Agriculture & Biology*, 14: 947-952.
4. OIE (2012). Manual of Diagnostic Tests and Vaccines for Terrestrial Animals online <http://www.oie.int/manual-of-diagnostic-tests-and-vaccines-for-terrestrial-animal>.



5. Schalm, O.W., Carroll, E.J. and Jain, N.C. (1971). Bovine Mastitis, 1stedition Lea Febiger, Philadelphia.
6. Sikder, S., Rahman, S.M.M., Ali, M. and Das, S. (2012). Haematological Variation in *Brucella abortus* antibody positive Cross-bred cattle at Chittagong, Bangladesh. *Veteriner Fakultesi Dergisi*, 23(3): 125-128.
7. Wills, T. B., Weiss, D.J. and Wardrop, K.J. (2010). Haematology of water buffalo (*Bubalus bubalis*). In Schalm's Veterinary Hematology, 6th Edn., Blackwell Publishing, Oxford, England, pp. 927-931.
8. Xavier, M.N., Paixao, T.A., Poester, F.P., Lage, A.P. and Santos, R.L. (2009). Pathological, immunohistochemical and bacteriological study of tissues and milk of cows and fetuses experimentally infected with *Brucella abortus*. *Journal of Comparative Pathology*, 140: 149-157.

