The Indian Journal of Veterinary Sciences & Biotechnology ***(2017) Volume 12, Issue 3, 81-84***

ISSN (Print) : 2394-0247 : ISSN (Print and online) : 2395-1176, abbreviated as IJVSBT

http://dx.doi.org/10.21887/ijvsbt.v12i3.7101

Submitted : 23-11-2016 ***Accepted : 21-12-2016*** ***Published : 15-02-2017***

Association of Retained Fetal Membranes with Haematological Profile in Crossbred Cows

K. Rokde, S. Kumar*, A. Bhardwaz, S.S. Mahour, S.P. Nema and R. Aich

Department of Veterinary Gynecology & Obstetrics,

College of Veterinary Science and AH, NDVSU, Mhow (MP), India

Corresponding Author: drsudarshandogra@yahoo.com

Abstract

This study was carried out on clinical cases of retained fetal membranes in crossbred cows presented at College Clinics and College dairy farm and from Villages in and around Mhow. The blood samples were collected from jugular vein just before 12 hr. postpartum and on 7th day postpartum. Haematological profile revealed that the mean values of haemoglobin, neutrophil and monocyte count after 12 hrs and 7th day postpartum were significantly lower and lymphocyte count was significantly higher in RFM cows (n=18) than normally calved cows (n=6). The differences in mean TLC, eosinophil and basophil counts were non-significant at 12 hrs postpartum, however on 7th day postpartum the TLC and eosinophil count were significantly higher and basophil count was non-significantly different in RFM cows than the normally calved cows.

Key Words: Crossbred cows, Normal calving, Retained Fetal Membranes, Haematological profile.

Introduction

Retention of fetal membranes (RFM), where the foetal membranes are not expelled within 8-12 hours after calving, lowers bovine productivity and fertility resulting in significance economic losses to the dairy industry (Attupuram et *al*., 2016). It may arise out of insufficient uterine contraction, nutritional deficiency, hormonal imbalance and reproductive diseases. However, optimum blood cellular levels are essential for maintenance of normal health and production. There is lack of studies about the association between haematological profiles and RFM affected cows. Neutropenia may be co-factor involved in the pathogenesis of RFM (Moretti *et al*., 2014), and haemoglobin deficiency might be one of the predisposing factors for RFM in cows (Samad et *al*., 1990). Estimation of total leukocyte count and differential leukocyte count at parturition are of diagnostic importance. These constituents may be helpful for predicting the occurrence of fetal membrane retention (Pandey *et al*., 2007). This study was planned to determine the association of RFM with haematological profile in crossbred cows.

Materials and Methods

The study was carried out on clinical cases of RFM presented to the Department of Veterinary Gynaecology and Obstetrics of the College as well as from College dairy farm and Villages in and

around Mhow including Ambulatory clinics. In all 24 crossbred cows were selected and were divided into control group (consisted of 6 cows which had normal 3rd phase of parturition) and RFM group (consisted of total 18 cows with RFM for more than 12 hrs). The blood samples were collected from jugular vein just before 12 hrs. postpartum and on 7th day postpartum in 3 ml sterilized vials. Haematological parameters were estimated as per the methods described by Jain (1986). The data was analyzed as per the standard statistical method by employing completely randomized design (Snedecor and Cochran, 1994).

Results and Discussion

The haematological changes, viz., haemoglobin, total leukocyte count, differential leukocytes count in RFM and normally calved cows noted at 12 hrs and 7th day postpartum are presented in Table 1. The mean level of haemoglobin was significantly (P<0.05) lower in animals with RFM than in the normally calved control group after 12 hrs and on 7th day postpartum. These findings are in agreement with Samad et *al*. (1990) and Ratre (1998). The lower level of haemoglobin concentration associated with RFM has been reported by many earlier researchers. Thus the fatigueness and anaemic condition of cows may be risk factors for this condition.

Table 1: Haematological parameters in control and RFM affected crossbred cows at 12 hrand 7th day postpartum (Mean±SE)

Parameters	12 hrs postpartum		CD (5%)	7th day postpartum		CD (5%)
	Control (n=6)	RFM (n=18)		Control (n=6)	RFM (n=18)	
Haemoglobin (g/dl)	10.31±0.20[a]	7.30±0.12[b]	0.36	10.51±0.23[a]	8.31±0.15[b]	0.46
TLC (10^3/cmm)	9.26±0.11	9.50±0.06	NS	7.50±0.17[a]	8.48±0.05[b]	0.20
Neutrophil (%)	35.33±0.55[a]	27.11±0.34[b]	0.99	34.83±1.22[a]	30.72±0.38[b]	1.41
Lymphocyte (%)	57.16±0.70[a]	62.44±0.40[b]	1.17	56.67±1.08[a]	60.83±0.41[b]	1.38
Monocyte (%)	3.83±0.40[a]	7.28±0.11[b]	0.78	3.67±0.33[a]	5.61±0.18[b]	0.55
Eosinophil (%)	2.33±0.61	2.56±0.39	NS	3.83±0.74[a]	2.22±0.39[b]	1.13
Basophil (%)	1.17±0.30	0.61±0.18	NS	1.00±0.36	0.61±0.11	NS

Figures in parenthesis indicate number of animals.

Means having different superscript within a row differ significantly (P<0.05).

The value of TLC on 12 hrs postpartum was statistically non-significant between control and RFM group. The similar findings have also been reported by Ray *et al*. (2004), but Samad et *al*. (1990) documented lower values in RFM cows and Skuja and Antane (2010) reported the higher level of TLC in RFM cows. The mean value of TLC on 7th day postpartum was found significantly (P<0.05) higher in RFM group than in the control group. Similar finding was also reported by Shukla *et al*. (1983) but Ratre (1998) reported that TLC was significantly lower in cows with RFM. Numerically higher TLC in normal cows may be due to inflammation and immune response associated with high leukocyte activity that promotes detachment of the RFM.

The neutrophil count was significantly (P<0.05) lower in animals with RFM than in control group. Similar findings were reported by Ray *et al*. (2004) in crossbred cows and Pandey *et al*. (2007) in buffaloes. In contrast, Samad et *al*. (1990) reported higher value of neutrophil count in RFM cows. The mean neutrophil count on 7th day postpartum in control group was significantly (P<0.05) higher

than RFM group of cows. Similar findings were also reported by Shukla *et al*. (1983) and Ratre (1998). RFM has to be considered as a syndrome with multifactorial causes, neutropenia due to acute stress may be a co-factor involved in the pathogenesis of RFM (Moretti *et al*., 2014).

The lymphocyte count was significantly (P<0.05) higher in animals with RFM than control group as noted by Ray *et al*. (2004) and Skuja and Antane (2010). In contrast, Samad et *al*. (1990) reported lower values in RFM cows. The mean lymphocyte count in control group on 7th day postpartum was significantly (P<0.05) lower than RFM group of cows, and corroborated with the reports of Shukla *et al*. (1983) and Ratre (1998). Lower lymphocyte count in normally calved group indicates acute inflammatory process and good index of systemic inflammation (Kataria and Kataria, 2006).

The value of monocyte count was significantly (P<0.05) lower in animals with RFM than in control group, and supported the observations of Samad et *al*. (1990), but Shukla *et al*. (1983) reported the higher value and Ray *et al*. (2004) reported non-significant difference. The mean monocyte count on 7th day postpartum was significantly (P<0.05) higher in RFM group of cows (%) than control group of cows (5.61±0.18 vs 3.67±0.33%), which concurred with Shukla *et al*. (1983) and Ratre (1998). Higher monocyte count in control group indicates early and late inflammatory response related with necrosis of fetal cotyledons caused by non-infectious diseases, leading to easy expulsion of fetal membranes.

The mean eosinophil count after 12 hrs postpartum did not differ significantly between normally calved cows and RFM group. Similar findings were also reported by Ray *et al*. (2004), but Samad et *al*. (1990) found higher value in RFM cows. Statistically (P<0.05) the mean eosinophil count on 7th day postpartum was found to be higher in control group than RFM group of cows (3.83±0.74 vs 2.22±0.39%), but the mean eosinophl count found in study was within normal range (Benjamin, 1985). Lower levels of eosinophils in RFM group of cows indicate hyperactivity of adrenal gland and stress condition.

The differences in mean values of basophil count at 12 hrs postpartum and on 7th day postpartum in normally calved and RFM group of animals were statistically non-significant, and corroborated with Samad et *al*. (1990) and Ratre (1998). Thus the haematological profile at parturition could help to identify cows at risk to RFM.

Acknowledgement

Authors are thankful to Vice Chancellor, NDVSU, Jabalpur and Dean, College of Veterinary Science and AH, Mhow for providing facilities to undertake this study.

Conflict of Interest: All authors declare no conflict of interest.

References:

Attupuram, N., Kumaresan, A., Narayanan, K. and Kumar, H. (2016). Cellular and molecular mechanism involved in placental separation in Bovine: A Review. *Mol.Reprod.Develop.,* 2016: 1-11.

Benjamin, M.M. (1985). Outline of Veterinary Clinical Pathology, 3rdedn.,Kalyani Publishers, New Delhi, India, pp 60-63.

Jain, N.C. (1986). *Schalm's Veterinary Haematology*. 4thedn. Lea and Febiger, Philadelphia, 526-527.

Kataria, A.K. and Kataria, N. (2006). Disease associated changes in white blood cell counts in the cattle. *The Indian Cows*, **4**(7): 25-27.

Moretti, P., Probo, M., Morandi, N., Trevisi, E., Ferrari, A., Minuti, A., Venturini, M., Paltrinieri, S. and Giordano, A. (2014). Early postpartum hematological changes in Holstein dairy cows with retained placenta. *Anim.Reprod. Sci.*, **152**: 17-25.

Pandey, A.K., Shukla, S.P., Pandey, S.K. and Sharma, Y.K. (2007).Haemato-biochemical profile in relation to normal parturient buffaloes with retained fetal membrane. *Buffalo Bull.,***26**(2): 46-49.

Ratre, U.K. (1998). Haemato-biochemical and therapeutic studies on retention of fetal membranes in cross-bred cows.M.V.Sc. thesis, Jawaharlal Nehru KrishiVishwaVidhyalay, Jabalpur (MP), India.

Ray, S.K.H., Dash, H.D., Mohanty, D.N., Das, S., Bisoi, P.C. and Barik, A.K. (2004). Studies on certain haematological and biochemical constituents in cows with retained fetal membranes. *Indian J. Anim. Reprod.*, **25**(2): 128-130.

Samad, M.A., Rahman, M.H., Sen, M.M. and Islam, T.S. (1990).Blood cellular changes in cross-bred dairy cows during placental retention.*Indian J. Dairy Sci.*, **43**(4): 453-454.

Shukla, S.P., Kharche, K.G. and Parekh, H.K.B. (1983). Calcium and phosphorus in relation to retained placenta in cross-bred cows. *Indian Vet.J.*, **60**: 183-188.

Skuja, S. and Antane, V. (2010). Postpartum serum biochemical and haematological changes in cows with and without retained fetal membranes. *Proc.16th Annual International Scientific Conference,***2**: 6.

Snedecor, G.W. and Cochran, W.G. (1994).*Statistical Methods*, 7thedn. Oxford and IBH Publishing Co., New Delhi, India, p. 312-317.

❑