COMPROMISED UTERINE HEALTH DURING POSTPARTUM PERIOD IN CROSSBRED CATTLE FOLLOWING RETENTION OF FETAL MEMBRANES

K.S. SHWETHA[1]*, V. CHANDRASHEKHARA MURTHY[2], A. KRISHNASWAMY[3], S.G. RAMACHANDRA, S.M. BYREGOWDA AND T. SURYANARAYANA

Department of Veterinary Gynaecology and Obstetrics
Veterinary College, Hebbal, Bangalore - 560 024

Received: 07.06.2016 Accepted: 26.08.2016

ABSTRACT

The postpartum uterine health was determined based upon endometrial cytology (% neutrophil, threshold fixed as 18% on day 20 postpartum and <10% on subsequent days) and total bacterial count (colonies per unit, CPU) in HF crossbred cattle expelling (n=10) or failing to expel (n=10) fetal membranes spontaneously. About 40% cattle with retained fetal membranes (RFM) and 80% of their normal counterparts had higher than threshold neutrophil count on day 20 postpartum. Total bacterial count revealed the uterus to be sterile on day 40 postpartum only in cattle with no RFM. Thus, the retention of fetal membranes was associated with compromised uterine health during postpartum period in crossbred cattle.

Keywords: Cattle, Endometrial cytology, PMN cells, RFM, Total bacterial count

The retained fetal membranes (RFM) were associated with reduced fertility of dairy cattle during postpartum period (Sheldon *et al*., 2009). In fact, the rate of development of secondary metritis was correlated with the length of time the membranes were retained. The failure to resolve the uterine contamination can compromise uterine function, and the persistence of pathogenic bacteria for at least three weeks postpartum causing clinical endometritis in 10-20% cattle (Sheldon *et al.,* 2009). The objective of present study was to compare uterine health during postpartum period in cattle with or without retention of fetal membranes.

Crossbred HF cattle with body condition score as 2.5, completed gestation period and calving normally were divided into two groups based upon spontaneous expulsion (n=10) or retention (n=10) of fetal membranes within 12 h after calving. In all the cattle, on day 10, 20, 30, 40, 50 and day 60 postpartum, 5 ml sterile normal saline was used aseptically for uterine lumen flushing. The material aspirated was used for endometrial cytology and for determining the bacterial count. The treatment for RFM was carried out after day 20 postpartum. The endometrial cytology was carried out by spreading the aspirated contents on a clean glass slide which was air dried, fixed with methanol, stained with Giemsa for 10 minute, washed and examined under microscope (400X) to determine the proportion of polymorphonuclear (PMN) cells. The uterine health was considered as normal when PMN cells were <18% on day 20 postpartum and <10% on day 30-50 postpartum (Kasimanickam *et al.,* 2004). The total bacterial count in a liquid culture was counted by the pour plate culture method. In this method, a measured amount of suspension was mixed with molten agar medium in a petri dish. After setting and incubation, the number of colonies was counted. As a compromise between sampling and overcrowding errors, the counts of pure culture was made on plate inoculated to yield between 50 to 500 colonies (ideally 200-400).

On day 20 postpartum, the endometrial cytology results revealed that 40% of cattle expelling fetal membranes spontaneously had PMN cell count in

[1]Ph.D Scholar, [2]Associate Professor, [3]Professor; *dr.shwetha.k.s@gmail.com

excess of 18% threshold limit. On day 30 postpartum, 30% cattle had PMN cells higher than threshold limit of 10%. From day 40 postpartum onwards none of the cattle exhibited PMN count in excess of minimum threshold value. On the other hand, the cattle with RFM had PMN count of 80, 60, 40, 30 and 30% on days 20, 30, 40, 50 and 60 postpartum, respectively. The elevated numbers of PMN cells are reflective of mild local inflammation due to influx of cells in the uterine lumen caused by the presence of bacteria and endotoxins (Sheldon and Dobson, 2004). Thus, the retention of fetal membrane is a major risk factor for the development of subclinical endometritis in dairy cattle (Santos *et al*., 2009).

In the present study, the animals expelling or failing to expel the fetal membranes spontaneously had high density of bacterial colonies (>500 colonies) when uterine lochia was subjected to bacteriological studies on day 10 postpartum. In fact, the bacterial presence in the uterus is usual at this time and can detected in >90% cattle regardless of disease signs (Sheldon and Dobson, 2004). Further, the presence of bacteria is sporadic from day 28 onward after calving and the uterine cavity should be sterile thereafter (Hussain, 1990). In present study, the number of bacteria colonies dramatically reduced to <500 by day 20 postpartum in both the groups and the animals with no RFM had sterile uterus by day 40 postpartum. In contrast, the uterus of cattle with RFM had bacterial colonies even by day 60 postpartum. In brief, these observations suggested an impaired defensive mechanism of the uterus of dairy cattle with retained fetal membranes.

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