

Cellular composition of uterine flushings and bacterial load of cervical mucus in healthy and endometritis affected buffaloes

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Migration of cells into the uterus is earliest mode of non-specific or cellular defense against microbial invasion. But, the type and number of cells present in the uterus is depending on physio-pathological condition of reproductive tract (Hussain and Daniel 1992) in cows. Information on this aspect is scarce in buffaloes which constitute major part of bovine population in Asian countries. The present paper is aimed to evaluate cellular composition of uterine flushings and bacterial load of cervical mucus and to make an attempt to modulate uterine defense mechanism by immunomodulators to increase fertility rates in endometritis affected buffaloes.

The buffaloes presented to the veterinary hospitals with a history of repeat breeding were subjected to gynaecological examination and white side test (Pateria and Rawal 1992) for selection of buffaloes. Healthy buffaloes (12) and those affected with endometritis were randomly selected for the study. The uterine flushings were collected by using Foley's balloon catheter (Singh *et al.* 2000). The total and differential cell counts in uterine flushings were recorded as per Singh *et al.* (2000) and viable cell count as per Subandrio and Noakes (1997). The bacterial colony counts in cervical mucus were recorded by standard plate count method. The data were subjected to t test as per Snedecor and Cochran (1989).

Cellular composition of uterine flushings in healthy and endometritis affected buffaloes is given in Table 1. Similar studies on cell counts in uterine flushings were also reported by Singh *et al.* (2000), Deori (2002) and Promod *et al.* (2002) in crossbred cows. Besides cellular changes, the biochemical composition of uterine flushings were reported by Promod *et al.* (2004) and Methai and Rajasundaram (2004). Once

Table 1. Comparison of cellular composition of uterine flushings between healthy and endometritis affected buffaloes

Parameter	Healthy (mean±SE)	Endometritis (mean±SE)	"t" value
Total leucocytic count (millions/ml)	00.09 ±0.01	00.13 ±0.01	2.93**
Lymphocytes (%)	38.13 ±0.53	21.59 ±0.25	9.44**
Polymorphonuclear cells (%)	40.83 ±0.80	45.62 ±0.83	4.29**
Monocytes (%)	00.33 ±0.13	00.53 ±0.18	0.88
Eosinophils (%)	00.19 0.09	00.41 ±0.16	1.21
Epithelial cells (%)	20.52 ±0.29	31.85 ±0.41	10.96**
Viable cells (%)	78.11 ±2.28	17.19 ±1.42	22.65**
Bacterial colony count (×10 ⁶)	3.75 ±0.84	79.58 ±8.10	9.31**

the physical defense mechanisms were breached, the next line of defense in endometritis was non-specific or cellular of innate immune system which included polymorphonuclear cells, lymphocytes, monocytes and eosinophils (Frank *et al.* 1992). These cells were reported to be migrating to uterus due to vaso-active substances like kallikreins and chemical mediators. The chemical mediators were interleukin, granulocyte macrophage colony stimulating factor, tumor necrosis factor, interferon and histone (Stevenson 1997) were noticed to be increased in inflamed uteri which modulate cellular influx (Zerbe *et al.* 1996). But, the functional activity of the migrated cells (Gottshall and Hansen 1992), myeloperoxidase enzymatic system and glucose accumulation in uterus (Old and Van Demark 1957) were depending on estrogen level. This might be the reason for presence of more number of bacterial colony counts in

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endometritis affected buffaloes though many pmn cells were migrated to the uterus of endometritis affected buffaloes. In the present study, the lymphocytes, mast cells and eosinophils appeared in low number in uterine flushing than in the peripheral circulation. Which was in accordance with Bondurant (1999) who reported that these cells typically patrol beneath the endometrium rather than in the uterine secretions to participate immunological activity by producing chemical mediators and immunoglobulins.

During endometritis, there was accumulation of super oxides due to failure of glutamic peroxidase and super oxide dismutase enzymatic systems. These super oxides destroy ovarian steroidogenic tissue (Margolin *et al.* 1990) result in aberrations of LH release at the time of estrus (Dhabale 1995) and prevent subsequent luteal formation (Paisley *et al.* 1986) which ultimately lead to failure of conception in endometritis affected buffaloes.

SUMMARY

The cellular composition of uterine flushings and bacterial load of cervical mucus were evaluated. An attempt was made to modulate uterine defense mechanism by immunomodulators to increase fertility rates in endometritis affected buffaloes.

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