ABSTRACT: The present study was undertaken to see the effect of mastitic pathogens on the blood and milk counts of Murrah buffaloes. Milk and blood samples were collected from 9 mastitic Murrah buffaloes. The total leucocyte Counts (TLC) and Differential leucocyte counts (DLC in blood were within normal range and there was a non-significant change in blood counts irrespective of different mastitic pathogens. Normal milk quarter samples had significantly (P<0.01) less Somatic cell counts (SCC. Lymphocytes were significantly higher in normal milk samples, whereas infected samples had a significant increase (P<0.01) in milk neutrophils. *S. aureus* infected buffaloes had maximum milk SCC, followed by *E. coli* and *S. agalactiae*. Influx of neutrophils in the buffalo mammary gland was maximum for *S. agalactiae*, followed by *E. coli* and *S. aureus*. The study indicated that level of mastitis had no affect on blood counts but it influenced the milk SCC of normal quarters.

Key words: Buffaloes, TLC, SCC, Pathogens.

INTRODUCTION - Mastitis is an inflammation of the mammary gland that often develops in response to intramammary bacterial infection and it remains as one of the most costly diseases in animal agriculture. An increase in the severity of mastitis leads to a significant increase in milk SCC in buffaloes (Vishnoi and Dang, 2007). This increment in SCC not only deteriorates udder health but also affects milk quality by releasing high amount of protease and lipase enzymes, which are highly heat resistant in nature and cause problem during processing of milk and milk products (Barbano et al., 2006). There are no reports of various associations between pathogen-specific cases of clinical mastitis (CM) and milk SCC in our Murrah buffaloes. Therefore, the present study was undertaken to find out if there is any relationship between various milk pathogens, blood and milk cell counts in Murrah buffaloes.

MATERIAL AND METHODS - Milk and blood samples were collected from 9 mastitic Murrah buffaloes, which reported for treatment in the Animal Health Complex. Milk samples were collected both from the infected and the adjacent normal quarter. Blood samples were collected in EDTA (1 mg/ml) and analyzed for Total leucocyte counts (TLC) under a haemocytometer, whereas, differential leucocyte counts were counted on blood smears spread over glass slides and stained with Leishman’s stain. SCC of each original milk sample was determined in duplicate within 2-h post collection. The milk was heated to 40°C in a water-bath held for 15 min at that temperature before being cooled to 20°C with careful...
stirring. 0.01 ml of milk was spread on a 1-cm² (0.5 x 2 cm) area of a degreased microscopic slide and was dried in a horizontal position. SCC and DLC of milk samples were measured microscopically after staining milk smears with May-Grunwald and Giemsa stain as described by Gonzalo et al. (2003). The SCC were measured under a magnification of 400 X in 50 fields and average number of cells per field was multiplied by the microscopic factor (0.882).

For bacteriological studies a 0.02 ml aliquot of each sample was spread on 5% sheep blood agar. The plates were incubated aerobically at 37 ºC and examined after 24 and 48 h. In the case of Staphylococcus aureus, isolates from one colony per inoculums were considered positive. Growth of two different types of colonies per type was considered as a mixed culture. Growth of three or more bacterial types was considered as a contaminated culture and was rejected. The statistical significance was tested by employing analysis of variance (ANOVA) as per Snedecor and Cochran (1994).

RESULTS AND CONCLUSIONS: Data on blood TLC and DLC of different buffaloes have been presented in Table 1 and Fig. 1 respectively. The TLC and DLC in blood were within normal range. Changes in blood TLC were found to be non-significant. There was also no difference in the percentage of neutrophils, monocytes and lymphocyte of buffaloes infected with different mastitic pathogens. This indicates that the condition might be localized affecting only the udder without systemic involvement (Lokanadhamu et al., 2005).

Data of milk SCC and DLC in samples collected from normal and infected quarters of mastitic buffaloes and types of milk pathogens have also been presented in Table 1 and Figure 1. Pathogens found in milk samples were S. aureus, Streptococci and Escherichia coli. S. aureus was found to be maximum 44% in buffaloes followed by E. Coli (33%) and S. agalactiae (22%).

In SCC of normal quarters, epithelial cells were the main cell types followed by lymphocytes, macrophages and polymorphonuclear cells (Dang et al., 2004). Values of SCC of normal quarters were higher then those reported by Singh and Ludri (2001). Coulon et al (1988) reported that a combination of infected udders and traumatic inflammation induced stress had a marked and potentially economic influence on SCC level. In the present study also as
the buffaloes were suffering from mastitis and were under stress therefore their milk SCC values were higher even in the normal quarters. 

*S. aureus* infected buffaloes had maximum milk SCC, followed by *E. coli* and *S. agalactiae*. *S. aureus* was also the most important microorganism responsible for mastitis in Nili Ravi buffaloes (Jaffery and Rizvi, 1975). This is contrary to the reports of Moroni *et al.*, (2006) who found that buffaloes having *Streptococcus* infection had more somatic cell score. Influx of neutrophils in the mammary gland was significantly more (P<0.001) for *E. coli* and *S. agalactiae* infected buffaloes. Intramammary infection by *E. coli* is acute in nature and generally clears within a few days. In contrast, infection by *S. aureus* is often less severe but results in a chronic infection that can persist for the life of the animal (Bannerman *et al.*, 2004). Clinical mastitis caused by Gram-negative pathogens, such as *E. coli*, *Klebsiella* spp., or *Pseudomonas* spp., occurred more often in herds with a low bulk milk SCC (Barkema *et al.*, 1998).

Murrah buffaloes are thought to be comparatively more resistant to mastitis due to their tight teat sphincter and also less milk SCC. The level of mastitis also non-significantly affect blood counts in buffaloes. Therefore, for increasing milk output in buffaloes, dairymen should try to eliminate first the existing infections and prevent the establishment of fresh infections as done for cows.

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