

## IMMUNOMODULATION EFFECT OF LEVAMISOLE AND IMMULITE ON UTERINE MICROBIAL PICTURE IN REPEAT BREEDING COWS

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### ABSTRACT

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Forty (40) cyclic non breeding cows presented at TVCC were assigned to four equal (10) groups Levamisole s/c. three injections at weekly interval @ 2.5 mg/kg body weight (group I), Immulite an herbal drug 20 ml orally for 10 days (group II), combination therapy of levamisole + immulite with same dose schedule (group III) was administered Ten animals subjected to saline uterine lavage (60 ml lukewarm normal saline) served as control (group IV) The total serum immunoglobulin (Ig) and uterine bacterial load were estimated at estrus before initiation of treatment and at subsequent estrus following treatments. The conception rate for each treatment regimen was also evaluated The pretreatment total Ig values (gms / dl) were  $1.95 \pm 0.07$ ,  $1.93 \pm 0.05$ ,  $1.90 \pm 0.06$ ,  $1.91 \pm 0.06$  in group I, II, III and IV respectively with corresponding post treatment value\* of  $2.37 \pm 0.04$ ,  $2.16 \pm 0.05$ ,  $2.46 \pm 0.05$  and  $1.75 \pm 0.05$ . The post treatment values in different experimental groups except control were significantly elevated ( $P < 0.01$ ) than their pre treatment counterparts The post treatment values within groups showed highly significant variation ( $P < 0.01$ ) on comparison between various groups except between group I and group III. The uterine bacterial load (millions/ml) in pre treatment sample did not differ significantly within groups and remained within a range of  $8.38 \pm 0.29$  (group II) to  $8.78 \pm 0.30$  (group III) where as post treatment bacterial count differed significantly ( $P < 0.01$ ) and averaged between 0.32 (group I) to 3.83 (group IV). In all the experimental groups the post treatment bacterial count significantly ( $P < 0.01$ ) reduced compared to their pre treatment values The test of significance of post treatment uterine bacterial load between various experimental groups recorded highly significant difference ( $P < 0.01$ ) except between group I and group III The overall conception rate was highest (70 per cent) in group III subject to combined therapy of levamisole and immulite followed by 60%, 50% and 40% in levamisole (group I), Immulite (group II) and control (group IV), respectively. However, no significant variation in conception rate was observed by chi square analysis The significant rise in total serum Ig, reduction in bacterial load in post treatment sampling with better conception rate of levamisole and immulite combined group was found to be most effective followed by levamisole alone in comparison to other mode of therapies.

**Key Words :** Immunomodulators, Levamisole, Immulite, Repeat Breeding, Immunoglobulin

Repeat breeding has been recognized as one of the worrisome infertility problem in dairy and it may be associated with subclinical endometritis in some cases (Arthur *et al.*, 1989) as the inner lining of female reproductive tract is susceptible to mechanical and environmental insults leading to introduction of microbes at estrus and parturition. These microbes can be rapidly removed from the reproductive tract due to immune response of the body. The level of various types of

immunoglobulins, fluctuates as per the reproductive status and uterine pathology. The failure of conventional therapy with antibiotics, antiseptics and hormones has necessitated alternate therapy with immunomodulators (Gilbert, 1992). In the present experiment the therapeutic efficacy of Levamisole and Immulite were tested.

Repeat breeding cows (n=40) presented from September 2008 to August, 2009 in the TVCC, C.V.Sc

and A.H., Bhubaneshwar were included in the study. The selected repeat breeder cows were randomly divided into four groups, Animals in group I received levamisole (1ml/30 kg bd. wt.) through S/C route at an interval of 7 days. Group II animals received immulite, an herbal preparation (20ml/day orally) for 10 days. Group III cows received combined treatment of group I and group II, while cows in group IV were infused with intra uterine normal saline infusion (60 ml) and served as control. Blood samples were collected for estimation of total serum globulin (Chauhan, 1995), from all the cows on the day of estrus before treatment and at subsequent estrus before artificial insemination. Similarly, uterine samples (Stiffen *et al.*, 1985) for bacterial count (Malik, 1967) were collected from all the cows. The conception rate for each treatment regimen was evaluated by per rectal examination. Data generated from present experiment were analysed statistically as per method suggested by Snedecor and Cochran, (1994).

In group I, it was observed that cows receiving levamisole, recorded a highly significant ( $P<0.01$ ) rise of total Ig (1.95 vs 2.37 gm/dl) after the treatment. Similarly, a highly significant decrease in bacterial load (8.52 vs 0.32 millions/ml) was observed. The overall conception rate in this group was 60% at first and second insemination. The corresponding figures for group II, III and IV were 1.93 vs 2.16, 1.90 vs 2.46 (gm/dl), 8.38 vs 1.26, 8.78 vs 0.55 (million/ml) and 50, 70 percent respectively. A highly significant increase in the total serum Ig ( $P<0.01$ ) with marked reduction in the bacterial load and improved conception rate, were observed. The difference between the treatment groups for all these parameters, were non-significant ( $P<0.05$ ). However, the difference was highly significant ( $P<0.01$ ) when compared with control group. The corresponding figure for control group were (1.91 vs 1.75 gm/dl), 8.42 vs 3.83 million/ml and 40 per cent respectively.

The normal Ig concentration of blood serum ranges from 1.8 to 3.2 gm/dl (Blood *et al.*, 1989 and Chauhan *et al.*, 1995). The total serum Ig reported in their study was 1.90 to 2.46 (gm/dl). This is in agreement with the findings of Mohanty (2006). However, Behera (2007)

reported higher values (3.28 to 5.43 gm/dl) in pre & post treatment period with different trials. The difference could be due to genetic make-up, nutritional status and other factors. The significant rise of total serum Ig after treatment is suggestive of immunomodulatory effect of the agents used in the present study. The present findings corroborates with the findings of Das (2006). On the contrary, in repeat breeding or endometritis in post treatment periods, very low uterine bacterial load have been observed by Das (2002) and Singla (2004). Many workers achieved significant reduction in bacterial load in case of mild to moderate endometritis by using herbal products (Kumar and Srivastav, 2006). Levamisole besides its immunomodulatory action tends to possess potent immunomodulating effect and being used to treat uterine infection and reproductive disorders in animals. (Gilbert, 1992). In Group IV the decline in bacterial load could be presumed due to dilution effect of normal saline along with estrogen priming and sexual rest. The significant reduction in bacterial load in each of test groups might be due to systemic or local immune conversion fortified with intrinsic factors. The discrepancies in bacterial load might be due to difference in agro climatic zones, environment, managemental practices and immunity status of the animal. No significant difference could be seen relating to conception rate as was evidenced from chi square analysis. Various workers have achieved appreciable improvement in conception rate (37% to 73%), while employing alternate forms of therapies. Panareai *et al.*, (2009) studied about the effect of immunomodulatory treatment with levamisole on uterine inflammation and involution. In the present course of investigation, it is logical to infer that the administration of levamisole might have potentiated both systemic and uterine defense mechanism favoring fertility with subsequent conception rate in levamisole or in combination group.

In conclusion the conception rate of levamisole and immulite combined group was found to be most effective followed by levamisole alone for establishing higher conception rate in comparison to other mode of therapies.

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