

PHYTOTHERAPY FOR ENDOMETRITIS AND SUBSEQUENT CONCEPTION RATE IN REPEAT BREEDING CROSSBRED COWS*

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ABSTRACT

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The present study was conducted to study the comparative effect of herbal extract of garlic (crude) and ashwagandha (hydro-ethanolic) with antibiotic ciprofloxacin for the treatment of endometritis and repeat breeding condition in cross bred cows. Sixty four repeat breeding cross bred cows with endometritis were divided into eight groups and treated with PBS, antibiotic ciprofloxacin Ashwagandha I/U, garlic I/U, ashwagandha oral, ashwagandha oral+ garlic I/U ashwagandha + garlic I/U, ashwagandha oral + I/U, respectively at estrus. At subsequent estrus after treatment, majority of cows treated with herbal extracts and antibiotic showed better recovery rate evidenced on the basis of clear mucus discharge, negative reaction to white side test, reduction in bacterial load in cervical mucus. Better conception rate was observed in ashwagandha + garlic group at par with ciprofloxacin treated group due to their synergistic effect in combating infection and good immunomodulatory properties (Mishra *et al.*, 2000) as compared to control, where no animal became pregnant. On the basis of present investigation, it is concluded that garlic + ashwagandha extract (Group-G) was found as the most effective treatment among all treated groups and, thus, can replace conventional antibiotic in future for bacterial endometritis leading to repeat breeding condition in cross bred cows.

Key words : Cross bred cows, endometritis, repeat breeder, phytotherapy.

INTRODUCTION

Repeat breeding is one of the major functional causes (40%) of infertility in dairy cows (Bhosrekar, 1973) posing considerable economic loss to dairy farmers. Endometritis, particularly subclinical endometritis has been the major cause of repeat breeding (Arthur *et al.*, 1989). Furthermore, it is bacterial endometritis that constitutes a major concern especially in crossbred cattle (Maurya *et al.*, 1992). Subclinical endometritis alter the physico-chemical properties of cervical mucus and, therefore, examination

of cervical mucus for appearance, consistency and pH may be valuable in its diagnosis. As far as therapeutic approach to repeat breeder cow is concerned, it involves either antibiotics and antiseptics or hormonal therapy (Hussain and Daniel, 1991; Vijayarajan *et al.*, 2007). However, these therapies involve high cost of treatment, inconsistent results, milk disposal and several other side effects. Therefore, herbal preparations called as phytotherapy were used for treatment of infectious endometritis and repeat breeding condition in cows in the present study.

MATERIALS AND METHODS

Repeat breeding crossbred cows (64) were selected on the basis of history, breeding records and per rectal examination. Further, subclinical endometritis was diagnosed by white side test. The repeat breeding animals were divided into eight treatment groups

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containing eight animals in each group, viz. A, B, C, D, E, F, G and H and different regimes of drugs were followed for seven days. In group A, 30 ml PBS was administered, once a day (OD), intrauterine (I/U). In group B, 30 ml ciprofloxacin was administered, OD, I/U. In group C, 30 ml garlic extract was administered, OD, I/U. In group D, 30 ml ashwagandha extract was administered, OD, I/U. In group E, 15 gm ashwagandha powder was administered, BID, orally. In group F, 30 ml garlic extract was administered, OD, I/U and 15 gm ashwagandha powder was administered, BID, orally. In group G, 30 ml each of garlic and ashwagandha extract was administered, OD, I/U. In group H, 30 ml ashwagandha extract was administered OD, I/U and 15 gm ashwagandha powder was administered, BID, orally. Estrual cervical mucus samples were collected on the day of estrus before and after treatment (on next estrus) and tested for appearance, pH, white side test and bacterial load. At subsequent estrus after treatment, all the animals treated were inseminated. Cows, which returned to heat after first insemination were again inseminated at second and third subsequent estrus after treatment. Pregnancy was confirmed per rectally after 45-60 days of insemination. The data so generated were analysed using analysis of variance (ANOVA) and Chi-square test to test the significant differences of means (Snedecor and Cochran, 1989).

RESULTS AND DISCUSSION

After treatment, in almost all groups, all cows (100 %) showed clear discharge except control and ashwagandha orally treated group. Clear estrual mucus is conducive for sperm penetration and conception, whereas, turbidity retards sperm motility in estrual mucus (Dev *et al.*, 1997). No reference could be traced about increase in clarity of mucus after treatment with herbal extract used. However, percentage of cows with clear discharge after treatment with antibiotic was found to be higher during the study than that reported by Saini *et al.* (1999). This may be attributed to the use of different antibiotic.

Maximum cows showed thick mucus before treatment, which is in agreement with the finding of

Selvaraj *et al.* (2002), who also reported a higher percentage (73.60%) of Repeat breeding cows with thick cervical mucus discharge. Consistency (thin/thick) of cervical mucus was decreased after treatment in all the groups although, difference was not significant. Thick cervical mucus may retard sperm motility and thus, may cause fertilization failure (Sharma and Tripathi, 1987) thus decreased consistency may be taken as an indicator for recovery of animals.

In this study, mean pH of estrual cervical mucus in all the groups before treatment was towards alkaline side (more than 7.7) indicating infection (Deori, 2002; Singla *et al.*, 2004). This increase in pH may be caused due to metabolites of bacteria and inflammatory exudates in estrual cervical mucus (Salphale *et al.*, 1993). Significant decline ($p < 0.05$) in pH was observed in all the groups after treatment. A significant decrease ($p < 0.05$) in pH of group B (7.36 ± 0.073), group C (7.40 ± 0.049), group D (7.48 ± 0.047), group E (7.43 ± 0.062), group F (7.40 ± 0.046), group G (7.25 ± 0.050) group H (7.31 ± 0.044) was observed as compare to group A (7.72 ± 0.052). Similarly a significant decrease ($p < 0.05$) in pH of group G (7.25 ± 0.050), group H (7.31 ± 0.044) was observed as compared to group D (7.48 ± 0.047) and a significant decrease in pH of group G (7.25 ± 0.050) was observed as compared to group E (7.43 ± 0.062). This reduction in pH may be due to decline in bacterial load and inflammatory process in uterus after treatment (Shaktawat, 2005).

All the crossbred cows taken in this study were positive (100 %) for white side test before treatment indicating positive for endometritis. At subsequent estrus after treatment, 75% cows in group A followed by 37.5% in group E, 25% cows in group C, D and F and 12.5% cows in group B, G and H became positive to white side test. Positive reaction to white side test could be explained on the basis of number of leukocytes present in the uterine discharge (Popov, 1969). The normal discharge has less number of leukocytes to cause any change of colour, whereas in clinical and subclinical cases of endometritis, discharge contains increased number of leukocytes causing a colour reaction (Pateria and Rawal, 1990). The absence of

colour development to white side test in higher number of cows treated with herbal extracts and antibiotics revealed their efficacy for combating infection. This result showed that ashwagandha and garlic are antibacterial and immunomodulatory in nature thus, reduced bacterial load and subsequently inflammation process (Sharma *et al.*, 1977; Ghazanfari *et al.*, 2002; Owis *et al.*, 2005).

The bacterial load recorded in the present study prior to treatment, ranged from 266.50 ± 7.05 to $318.00 \pm 14.57 \times 10^4$ per ml of cervical mucus. In contrast to this Goswami *et al.* (1992) reported a lower range of bacterial load of 35.05×10^4 per ml in cervical mucus of repeat breeding cows. During this study, at subsequent estrus after treatment, there was a significant decline ($p < 0.05$) in bacterial load in the cervical mucus of all the groups except the group A. The per cent reduction was highest in group B followed by a group C, group F, group D, group G, group H, group E and group A cows. Bacterial count ($\times 10^4$ /ml) in group B ($.88 \pm .017$), group C ($1.03 \pm .056$), group D ($1.16 \pm .106$), group E ($3.56 \pm .145$), group F ($1.05 \pm .065$), group G ($1.24 \pm .075$), group H ($1.31 \pm .067$) at subsequent estrus after treatment varied significantly ($p < 0.01$) as compared to group A (281.00 ± 13.09).

This finding corroborates with that of Xiang (2009), who also reported that ciprofloxacin is effective against most of the bacteria found in cervical mucus of cows suffering from endometritis.

Better recovery and conception rate was found in ashwagandha + garlic and ciprofloxacin treated group as compared to control, where no animal became pregnant. The cows treated with herbal preparations and antibiotic had better recovery rate as compared to control group of cows. The recovery rate was 25% cows in group A, 87.5% cows in group B, 75% cows in group C, 75% cows in group D, 62.5% cows in group E, 75% cows in group F, 87.5% cows in group G and 87.5% cows in group H. Maximum conception rate of 75% was achieved in both group B and group G, followed by group F and group H (62.5%), group C and group D (50%) and group E (37.5%). No animal became pregnant in control group. Better recovery and conception rate

observed in ashwagandha + garlic treated group may be due to their synergistic effect and combined broad spectrum antibacterial and good immunomodulatory properties (Mishra *et al.*, 2000). The conception rate observed with treatment of garlic alone is in accordance with finding of Garg *et al.* (1983) and Sarkar *et al.* (2005). However, conception rate observed in ciprofloxacin treated group is lower than that reported by Xiang (2009; 75% vs 87%).

It is concluded from this study that the herbal treatment of endometritis and thus repeat breeding crossbred cows with intrauterine infusion of ashwagandha and garlic extract, for seven consecutive days post estrus, cured the condition and subsequently improved conception rate on par with ciprofloxacin.

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