

SYNERGISTIC EFFECT OF ANTIBIOTICS AND OXYTOCIN IN THE TREATMENT OF ENDOMETRITIS IN MARES

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ABSTRACT

The present study was designed to investigate the effect of oxytocin, with or without intrauterine antibiotics infusion, on conception rates in 150 endometritic mares. Uterine swabs were collected from each mare and processed for antibiotic sensitivity tests. Samples from 135 mares showing bacterial growth and antibiotic sensitivity were divided into following groups: Control, given oxytocin only, Gentamicin or gentamicin + Oxytocin, Chloramphenicol or Chloramphenicol + Oxytocin, Streptopenicillin + Kanamycin or Streptopenicillin + Kanamycin + Oxytocin, and Norfloxacin or Norfloxacin + Oxytocin. After treatment for five days, one heat was missed and on second heat mares were bred through natural mating and examined for pregnancy at least 60 days after service. The overall conception rate in mares of groups treated using antibiotics without oxytocin (62.22%) was significantly higher ($P < 0.05$) as compared to 40.00% in the control group. However, conception rates in mares of former groups did not differ from one another. Similarly, overall conception rate in mares treated using antibiotic + oxytocin combination (82.62%) was significantly higher ($P < 0.05$) than overall conception rate in mares treated with antibiotics alone (62.22%), or control (40.00%). It was concluded that oxytocin alongwith some suitable antibiotic (s) may be used for the treatment of endometritis and improvement of conception rates in endometritic mares.

Key words: Mares, antibiotics, oxytocin, endometritis, conception rates

INTRODUCTION

In the mare, transient endometritis is a normal event during the immediate period after mating, and resolves within 48-72 hours (Peterson *et al.*, 1969). The predisposing factors for this post breeding endometritis include, reproductive anatomy, defective myometrial contractility, lowered uterine defenses, over production of mucus, inadequate lymphatic drainage or a combination of these factors (Watson, 2000). The fertilized ovum enters uterus about 5-6 days after ovulation (Roberts, 1986), and in the presence of endometritis, the cytotoxic environment does not seem to be compatible with pregnancy (Watson, 2000).

Mares affected by endometritis are usually treated through intrauterine antimicrobial medication (Ricketts, 1986). Intrauterine and intramuscular administration of oxytocin is widely used to stimulate uterine contractions and to promote drainage (England, 1996). However, there is little information available in literature regarding the efficacy of oxytocin, alone or in combination with antibiotic, in the treatment of endometritis and improving conception rates in mares suffering from endometritis. Therefore, the present

study was carried out to investigate the effects of intramuscular administration of oxytocin, with or without intrauterine antibiotics infusion, on conception rate in endometritic mares.

MATERIALS AND METHODS

In this study, 150 adult mares with the history of repeat breeding, reported for treatment of endometritis during the period from 1992 to 2001, were used. The clinical status of each mare was confirmed through rectal palpation. Uterine swabs were collected aseptically from each mare following the method described by Brook (1984), with slight modification. The swabs were processed on nutrient broth as well as blood agar plates for antibiotic sensitivity tests (Cruickshank, 1975). Samples from 135 mares showing bacterial growth and antibiotic sensitivity were divided into following groups:

1. Control (n=45)
2. Gentamicin (n=08)
3. Gentamicin + Oxytocin (n=10)
4. Chloramphenicol (n=13)
5. Chloramphenicol + Oxytocin (n=09)

6. Streptopenicillin + Kanamycin	(n=10)
7. Streptopenicillin + Kanamycin + oxytocin	(n=14)
8. Norfloxacin	(n=12)
9. Norfloxacin + Oxytocin	(n=14)

The following preparations of various antibiotics were used:

- i). Gentamicin (Inj. Gentafar, Farvet, Holland), 12 ml.
- ii) Chloramphenicol (Pliva, Pakistan), 5 gm.
- iii) Streptopenicillin-kanamycin (Inj. Polybiotic, PDH, Pakistan + Inj. Kanamycin Sulphate, Elko, Pakistan) 5 gm + 2 gm, and
- iv). Norfloxacin (Inj. Agril, Agrar, Holland), 10 ml.

The respective most effect antibiotic was dissolved in distilled water to a volume of 50 ml for intrauterine infusion. Then, 20 IU oxytocin (Venus Pharma, Lahore, Pakistan) was administered intra-muscularly in the control, as well as in the antibiotic + oxytocin groups. Treatments were repeated after 24 hour intervals for five days.

After treatment, one heat was missed and on the second heat, mares were bred through natural mating by stallions of proven fertility. Animals were examined for pregnancy through rectal palpation at least 60 days after service. Conception rates in mares of various groups were computed. In order to see the magnitude of variation in conception rates among mares of various groups, the data were subjected to statistical analysis using Chi-square test (Samuels, 1991).

RESULTS AND DISCUSSION

In this study, 150 samples were collected from mares suffering from endometritis. Among these, bacterial growth and antibiotic sensitivity was observed in 135 (90%) samples. Seven samples (4.66%) showed no growth. This lack of bacterial growth may be due to mycotic infection, as has previously been reported in dairy animals (Osman and Gopal, 1975). Drug resistance was observed in 8 (5.33%) samples. Conception rates obtained after the treatment of endometritic mares with various treatments are presented in Table 1.

The pregnancy rates were 40.00, 62.50, 61.50, 60.00, and 58.33% in control, gentamicin, chloramphenicol, streptopenicillin + kanamycin, and Norfloxacin treated groups, respectively. The values were 80.00, 77.78, 85.71 and 85.71 in gentamicin-

oxytocin, chloramphenicol-oxytocin, streptopenicillin-kanamycin- oxytocin and norfloxacin-oxytocin groups, respectively. The overall conception rate in mares of groups treated using antibiotics without oxytocin (62.22%) was significantly higher ($P<0.05$) as compared to 40.00% in the control group. However, conception rates in mares of former groups did not differ from one another. Similarly, overall conception rate in mares treated using antibiotic + oxytocin combination (82.62%) was significantly higher ($P<0.05$) than overall conception rate in mares treated with antibiotics alone (62.22%), or control (40.00%).

Houdeshell and Hennessey (1972) administered gentamicin in 98 endometritic mares and found 70.41% conception rates. Similarly, in an other study involving 60 endometritic mares treated with 1.0 to 2.5 gm gentamicin daily for 5 days, 86% mares showed no growth cultures following treatment and 74% produced foals (Jackson *et al.*, 1972). These findings are in agreement with the results of the present study.

Chloramphenicol has been commonly used for the treatment of uterine infections because of its better effectiveness and economic feasibility (Houdeshell and Hennessey, 1972). It has been reported to be effective against *Staphylococci*, *Streptococci*, *E.coli*, *Proteus vulgaris*, *Corynaebacterium spp.*, *Pseudomonas spp.*, and *Shigella spp.* According to Davis (1986), chloramphenicol suppresses antibody production and can interfere with the development of active immunity. Khan and Khan (1989) recorded 44.89% conception rates in endometritic buffaloes after intrauterine treatment with chloramphenicol, which differs with the findings of the present study. Besides species differences, variations in the degree of infection can be attributed to these discrepancies.

Khan *et al.* (1990) reported the use of a combination of streptopenicillin and kanamycin for the treatment of endometritis to achieve better conception results after treatment, which supported the findings of the present study. In literature, the use of norfloxacin for intrauterine infusion in mares has not been reported so far and the present work seems to be the first one in this regard. Being broad spectrum, norfloxacin has shown equally good results and can be used successfully for intrauterine treatment of endometritis in mares.

Significantly higher conception rates recorded in this study through oxytocin administration alongwith antibiotics are supported by the findings of Pritchard and

Table 1: Conception rates in endometritic mares treated with various treatment regimens.

S.No.	Group	n	Conception rate	
			No.	%
1	Control	45	18	40.00
2	Gentamicin	8	5	62.50
3	Gentamicine + oxytocin	10	8	80.00
4	Chloramphenicol	13	8	61.50
5	Chloramphenicol + oxytocin	9	7	77.78
6	Streptopenicillin + kanamycin	10	6	60.00
7	Streptopencillin + kanamycin + oxytocin	14	12	85.71
8	Norfloxacine	12	7	58.33
9	Norfloxacine + oxytocin	14	12	85.71

Newcomb (1996). These workers have reported higher pregnancy rates in oxytocin-antibiotic treated mares than those treated with antibiotic alone (72.00 Vs 64.00%, $p < 0.01$). Similarly, they observed significant differences in overall conception rates in control and antibiotic treated mares (56.00 Vs 64.00%, $p < 0.01$).

The treatment of uterine infection with antibiotics + oxytocin appears to have synergistic effect, which can be due to two different modes of action of the combined treatment: namely antibacterial activity of the antibiotic and fluid drainage activity of oxytocin. According to Walter and Carta (1986), elimination of infectious organisms, reduction in uterine size, improvement of uterine tone and elimination of uterine fluids are desirable for the successful treatment of endometritis. Therefore, it may be concluded that oxytocin alongwith some suitable antibiotic (s) should be used for the treatment of endometritis and improvement of conception rates in endometritic mares.

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