

Original Research Article

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## Incidence of Bacterial Pathogens Causing Infection in Equine Reproductive Tract

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### ABSTRACT

#### Keywords

Equine reproduction, Reproductive pathogens, Isolation, identification

#### Article Info

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Uterine infection is one of the main causes of equine infertility in thoroughbred mares. A timely diagnosis and an efficacious treatment in the breeding season would be essential for a successful breeding outcome. The current study was to identify the bacterial infection based on growth in culture media. In one season out of 107 mares, 45 mares (42%) were positive for culture and 62 mares (58%) were negative for any pathogens. A total of 216 cervical swabs were taken. Seventy sample (32%) were positive for culture and 146 (68%) were negative. In that 64 (91%) cultures were contained only single type of organism and 6 (9%) cultures were mixed colonies that had two types of organism. In our study, *Escherichia coli* was the major isolate followed by *Staphylococcus* spp. and *Streptococcus* spp. beta haemolytic group.

### Introduction

Asbury (1986) stated that uterine infections had long been recognized as one of the major causes of reduced fertility in the mare. This leads to major losses in equine industry. The expenses of breeding, rectal palpation, ultrasonography, boarding, mare transport, semen shipment and stallion collection fees could never be recovered if a mare failed to conceive (Samper *et al.*, 2007). Potentially pathogenic organisms were introduced during natural breeding, artificial insemination, during and after parturition, during

examination and as a result of failure of physical barriers to infection. When uterine defense mechanisms function properly, they clear bacterial infection without interfering reproduction (Frontoso *et al.*, 2008).

Bacterial uterine infections were the major loss in the equine breeding industry occurring in 25-60% of barren mares (Bain, 1966 and Collins, 1964). Benko *et al.*, (2015) stated that 69.7 percent of cervical swabs were positive for pathogenic micro-organisms; of those (307 positive findings) 40.4 percent contained  $\beta$ -haemolytic streptococci and 20.4 percent

*Escherichia coli* (19.5% non-haemolytic, 5.9% haemolytic). Since horses are seasonal breeders, it is very important to diagnose and treat the uterine infections as soon as possible to get early foals.

## Materials and Methods

### Study population

This study was conducted in a thoroughbred stud farm located in South India. A Total of 107 mares were included in this study. Cervical swabs were taken when the mares were in season and the cervix was relaxed. Repeatability of mares is common because not all the mares are having chance to become pregnant in single covering. Finally 216 culture samples were taken for this study.

### Clinical examination and collection of samples

Mares were looked for any vaginal discharge. Since the vestibule is long in mares, mild to moderate discharges are not seen outside. Usually some mares look apparently normal, but while doing rectal examination vaginal

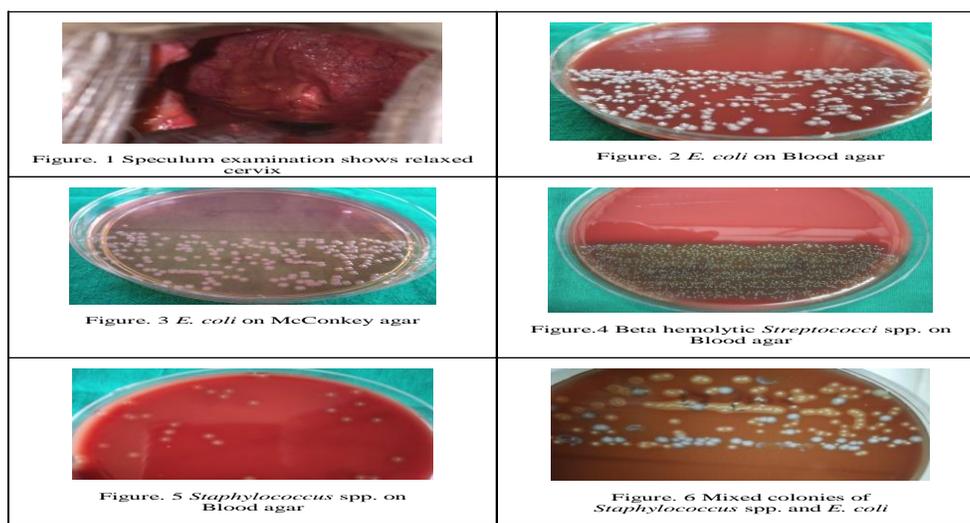
discharge was seen because of the back racking.

Perineum was washed thoroughly with 0.1 % Povidone Iodine solution in cotton and dried. Sterilized vaginal speculum was inserted into the vagina and cervix was examined for relaxation, discharge and any post foaling bruises. Sterile swab stick was introduced into cervix approximately 5 cm deep. Swabs were collected by rotating them clock wise and anti-clock wise to obtain adequate sample. It was made sure that the swab stick did not touch any other part other than cervix (Figure 1).

### Isolation of organism

Within one hour of sampling, swabs were smeared on sheep blood agar and McConkey agar. These agar plates were used for isolating, cultivating and determining hemolytic reactions of pathogenic micro-organism. Plates were inverted and incubated at 37°C and examined 24 hours and 48 hours. After 48 hours the culture samples were categorized either as substantial growth or no growth or contaminated.

## Fig



## Results and Discussion

A total of 216 cervical swabs were taken in this study. Seventy sample (32%) were positive for culture and 146 (68%) were negative and Forntoso *et al.*, (2008) found 49% positive at bacteriological investigations in their study.

In that 64 (91%) cultures were contained single type of organism and 6 (9%) cultures were mixed colonies that had two types of organism. Thirty four samples (49%) had *E. coli* (Figure 2 and 3), 19 samples (27%) had *Staphylococcus* spp. (Figure 4) and 11 samples (16%) had *Streptococcus* spp. beta haemolytic group (Figure 5). Three samples (4%) had *E. coli* + *Staphylococcus* spp., (Figure 6) 2 samples (3%) had *Streptococcus* spp. beta haemolytic group + *Staphylococcus* spp. and one sample (1%) had *E. coli* + *Streptococcus* spp. beta haemolytic group.

*Streptococcus* spp. were the most common isolates found by Forntoso *et al.*, (2008) and Riddle *et al.*, (2007) with 31.7% and 34% respectively and *E. coli* was the second isolate in their study. Wingfield Digby and Ricketts (1982), LeBlanc *et al.*, (2007) and Dascanio (2011) also showed that *Streptococcus* spp. was the most common bacteria isolated from mare's reproductive tract. But in our study, *E. coli* was the major isolates followed by *Staphylococcus* spp. and *Streptococcus* spp. beta haemolytic group. Albihn *et al.*, (2003) also stated that *E. coli* was most frequently associated with fertility problems and beta haemolytic *Streptococci* were the second most frequent. This may be due to variations in the geography and climate.

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