

## BACTERIAL ISOLATES AND THEIR ANTIBIOGRAM FROM GENITAL DISCHARGES OF PUERPERAL AND REPEAT BREEDING CROSSBRED COWS

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### ABSTRACT

The study was conducted on early postpartum (25±2 days PP, n=30) and repeat breeder (RB, n=40) crossbred cows to evaluate genital infections, their antibiogram and fertility following use of suitable antibiotics. The puerperal discharges of 19 (63.3%) cows and CVM of 28 (70.0%) RB cows yielded bacterial isolates of mixed infection, Gram-positive bacilli/rods, *Streptococcus* spp., Gram-negative bacilli/rods, *E. coli*, *Corynebacterium*, *Micrococcus* spp., *Streptococcus* spp., *Micrococcus* spp. and Anthracoid, whereas the rest of the samples were sterile. The sensitivity of isolates to 13 antibacterial drugs tested ranged between 5.3-63.2% among puerperal cows and between 25.0-50.0% in RB cows, with the highest sensitive to Gentamicin (63.2 and 50.0%) and maximum resistance to Penicillin (94.7%) in both groups. The cows yielding bacterial isolates in both groups were treated with sensitive antibiotics (i.m.) for 3-5 d and those not yielding bacterial growth served as controls. The animals were inseminated at subsequent estruses and followed for repeating to estrus for three cycles and/or pregnancy. Overall pregnancy rates in PP treated and control cows was 47.4% and 63.6%, respectively. Overall pregnancy rates in RB treated and control cows was 57.1% and 66.7%, respectively. In brief, variable prevalence of genital infections observed in early postpartum and repeat breeder cows indicated bacterial invasion with gentamicin being the highest effective antibiotic. The cows failing to get pregnant in the absence of bacterial growth indicated involvement of other reasons for repeating to estrus.

**Keywords:** Antibiogram, Cows, Fertility, Puerperal endometritis, Repeat breeding

Improper management, nutritional imbalance, hormonal disturbances especially ovulatory failure, anatomical defects and endometritis are known reasons responsible for repeat breeding in bovines. During postpartum period, the presence of bacteria in uterus causes inflammation, histological lesions of endometrium and delays uterine involution. A study indicated that the uterus of 40% cows remains contaminated beyond three weeks postpartum (Sheldon *et al.*, 2008). Uterine pathogens namely *Escherichia coli* and *Trueperella pyogenes* are related with endometrial inflammation (Werner *et al.*, 2012). This study was carried out to evaluate genital infections, its antibiogram and therapeutic use of broad

spectrum antibiotics in early postpartum and repeat breeder crossbred cows to make the cows pregnant.

Crossbred cows with puerperal infection (25±2 days postpartum, PP, n=30) and repeat breeding (RB, n=40) condition without palpable genital abnormalities were used in the present study. The genital discharge/cervico-vaginal mucus (CVM) of these cows were aspirated aseptically from cervix/vaginal fornix by using sterilized glass pipette (10 ml capacity) with wide mouth end, employing recto-vaginal technique (Panangala *et al.*, 1978). The samples were soon subjected to cultural isolation on blood agar plates. The isolates were subjected to detailed identification using Gram's staining and biochemical tests such as oxidase, KOH and catalase tests. The isolates were subjected to *in vitro* antibiotic sensitivity test for their

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sensitivity to 13 different antibiotics. The cows yielding bacterial isolates were treated (i.m.) using sensitive antibiotics for 3-5 d (PPT, n=19; RBT, n=28). Following recovery from genital infections, these animals were inseminated at three subsequent estruses, if not conceived. The animals not yielding any bacterial growth were placed under control group (PPC, n=11; RBC, n=12) and were inseminated and followed for repeating to subsequent two estruses and/or pregnancy.

Out of 30 early postpartum (PP) and 40 RB cows screened, 19 (63.3%) and 28 (70.0%) cows, respectively, yielded bacterial isolates, while the rest 11 PP (36.7%) and 12 RB (30.0%) cows did not yield any bacterial culture. This was suggestive that genital tract of about 2/3<sup>rd</sup> cows was harbouring bacterial infection to cause infertility.

In 19 puerperal cows, the highest rate of bacterial isolates were located as mixed infection (31.6%), followed by Gram-positive bacilli (21.1%), *Streptococcus* spp. (15.8%), Gram-positive rods (10.5%), and *E. coli*, *Micrococcus* spp. and Gram-negative rods (5.3% each). In an earlier study, 93% bovine uteri were infected up to day 15, 78% up to day 30, 50% up to day 45 and 9% up to day 60 postpartum (Elliot *et al.*, 1968). Similar findings about the bacterial isolates from purulent vaginal discharge were reported earlier (Patel *et al.*, 2009 and Brodzki *et al.*, 2014). The bacterial isolates of 28 RB cows had highest rates of mixed infection and *Streptococcus* spp. (17.8% each), followed by Gram-negative bacilli and rods (14.3% each), Gram-positive bacilli and rods (10.7% each), *Corynebacterium* (7.1%), *Micrococcus* spp. and Anthracoid (3.6% each). The prevalence of these non-specific bacterial agents have also been reported by earlier researchers (Mane *et al.*, 2009 and Zaman *et al.*, 2015).

The isolates obtained from puerperal cows were highest sensitive to Gentamicin (63.2%), followed by Ceftriaxone (52.6%), Enrofloxacin (47.4%), Streptomycin (36.8%), and Ciprofloxacin,

Tetracycline and Oxytetracycline (21.1% each), and Ceftriaxone+Tazobactam (15.8%), Co-trimoxazole (10.5%), Ampicillin (10.5%), Amoxicillin (10.5%), Ampicillin plus Salbactam (10.5%) and Penicillin (5.3%). The maximum resistance was for Penicillin (94.7%), followed by Amoxicillin, Ampicillin, and Ampicillin plus Salbactam, Co-trimoxazole (89.5% each), Ceftriaxone plus Tazobactam (84.2%), Ciprofloxacin (79.1%), and Tetracycline and Oxytetracycline (78.9% each). In a previous study, gentamicin was reported to be highest sensitive drug in postpartum buffaloes (Patel *et al.*, 2009). However, the sensitivity of the bacterial isolates obtained from the uteri of the cows with retained fetal membranes was highest for the combination of metronidazole and ciprofloxacin (Cohen *et al.*, 1996).

The isolates of repeat breeding cows were highest sensitive for Gentamicin (50.0%), followed by Ciprofloxacin (46.4%), Oxytetracycline (42.8%), Enrofloxacin (39.3%), Tetracycline, Ampicillin (35.7% each), Ceftriaxone plus Tazobactam, Streptomycin, Ceftriaxone and Ampicillin plus Salbactam (32.1% each), Co-trimoxazole and Amoxicillin (25.0% each) and Penicillin (21.7%). In an earlier study, Ciprofloxacin, Gentamicin, Norfloxacin, Chloramphenicol, Nitrofurazone and Furazolidone were more effective to the extent of 64.5-93.5% in repeat breeder cows (Sawale *et al.*, 2006). Others also documented highest sensitivity (>92%) to Ciprofloxacin (Mane *et al.*, 2009) and Enrofloxacin (Reddy *et al.*, 2012) followed by Gentamicin (83.33%).

The pregnancy rates in antibiotics treated PP cows in their post-treatment 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> cycles were 10.5, 31.6, and 5.3%, respectively, with an overall pregnancy rate of 47.4%. The corresponding pregnancy rates in untreated puerperal cows were 18.2, 45.4 and 0.0%, respectively, with an overall pregnancy rate of 63.6%. The pregnancy rates in treated repeat breeder cows for their 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> post-treatment cycles were 7.1, 39.3 and 10.7%, respectively, with an overall pregnancy rate of 57.1%, and the corresponding pregnancy rates in untreated repeat breeder cows were 33.3, 16.7 and

16.7%, with an overall pregnancy rate of 66.7%.

The present findings in view of getting the postpartum and repeat breeder cows pregnant were suggestive of probable prevalence and role of genital infections. In addition, there is a wide scope of ruling out subclinical genital infections and possibilities to manage the genital infections through systemic antibiotic treatment. However, the others cows without bacterial isolates and/or therapy getting pregnant clearly indicated the possible role of other reasons for making them to repeat and to become pregnant as a part of natural tendency of the female to settle down physiologically.

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