Available online at http://www.bajas.edu.iq

College of Agriculture, University of Basrah
DOi:10.21276/basjas

Basrah Journal of Agricultural Sciences

ISSN 1814 – 5868 Basrah J. Agric. Sci., 30(1): 53-58, 2017 E-ISSN: 2520-0860

Identifying and Treating of Uterine Infection in Cows of Basrah city

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Received 9 April 2017; Accepted 10 June 2016; Available online 26 June 2017

Abstract: The present study was conducted from December 2015 to February 2017 on a local breeds and Holstein Friesian with 88 cows (age 4-12). Metritis was diagnosed by clinical examinations using gloved hand and rectal uterine palpation as well as by bacteriological examinations using swabs. Antibiotic therapy was applied for the treatment of metritis in cow followed by one injection of luteinizing hormone. Examined cows were randomly divided into five groups. In group A (n=15), administration of oxytetracycline was used for one day. Group B (n = 18), received lugols iodine for one day. Group C (n = 22), received penicillin with streptomaycin for one day. Group D (n=7) received intramuscular administration of gentamycin for one day. Finally, group E (n=26) received safapirin for one day . All treatment followed by one injection of luteinizing hormone. Different type of bacteria was isolated from the cow uterus including *Escherichia coli* (40%), *Proteus vulgaris* (13.63%), *Corynebacterium pyogenes* (6.81%), *Staphylococcus pyogenes* (20.45%), *Pseudomonas aeruginosa* (5.68%), and *Streptococcus* spp.(7.95%). *E.* coli was frequently isolated from the cow uterus (40%). Safapirin and penicillin-streptomaycin were the most effective in treating metritis as they represented 84.61% and 81.81%, respectively. Lugols iodine and oxytetracycline, were also considerably effective in treating metritis as they represented 61.11% and 60.00%, whereas gentamycin intramuscularly accounted about 28.57%.
Key words: Dairy cows, Uterine Infection, antibiotics, hormones.

Introduction

Uterine infection is a common disease that lead to economic losses in dairy cows due to reduce milk production and a poor fertility (Frago *et al*., 2004; Studer *et al*., 1978). Retained placenta, dystocia, twining, and stillbirth might be predisposing factors leading to uterine infection in dairy cows (Grohn and Rajala-Schultz 2000). Metabolic diseases such as milk fever, ketosis, and displaced abomasum might also be predisposing factor of metritis (Jeffry and Edward 1988). Uterine bacterial infection also well known as etiological agent of metritis. Bacterial contamination of the uterine lumen is common in dairy cows after parturition, leading to Uterine infection. Different type of bacteria can be frequently isolated from the cow uterus after parturition, including

Trueperella pyogenes (43.5%), *Escherichia coli* (21.5%), *Bacillus* spp. (21.0%), and *Streptococcus uberis* (18.5%). Those microorganisms are important predisposing factors that lead to uterine infection in dairy cow (Sheldon e*t al*., 2002; Williams *et al*., 2005; Bicalho *et al*., 2012).

The early diagnosis and treatment of uterine infection is necessary to elevated milk production and improve fertility. Different diagnostic techniques have been used to identify uterine infection, including transrectal uterine palpation of the reproductive tract (Sheldon and Dobson, 2004), ultrasonographic assessment of uterus and ovaries (Fissore *et al*. 1986), vaginoscopic examination, culture of uterine secretions using swabs, uterine biopsy (Bonnett *et al*., 1991) , and uterine cytology.

The most common method of treatment is either intrauterine (Galvão *et al*., 2009) or systemic antibiotic treatment (Kauffman *et al*., 2010). Although intrauterine or systemic antibiotic treatments improve clinical signs of metritis (Chenault *et al*., 2004), the treatments did not improve fertility. This study aimed to test the effect of five treatments on uterine Infection followed by injection of luteinizing hormone (LH).

Materials and Methods

Study design

The study was conducted from December 2015 to February 2017 on a local breeds and Holstein Friesian with 88 cows (age 4-12). Clinical examination, laboratory examination, and treatment were performed with the aim of testing the effect of five treatments on uterine Infection followed by injection of luteinizing hormone . Clinical examination included manual vaginal examination, evaluation of secretion from the vagina, and palpation of the uterus. Laboratory examination included bacteriological examination. Treatment of uterine Infection was based on intrauterine or systemic antibiotic administration, followed by injection of LH.

Diagnosis and treatment of uterine infection

Clinical examination

Firstly, cows were examined for the discharge on the vulva, perineum or tail. If discharge was not visible externally, cows were inspected vaginally using gloved hand. The gloved hand was inserted through the vulva and mucus contents of the vagina collected manually for inspected of color and proportion of pus. Following vaginal examination and evaluation of secretion, rectal Palpation of the reproductive tract was performed. The location of the uterus, symmetry of the uterine horns, and diameter of the uterine horn was recorded.

Bacteriological Examination

Swabs from the lumen of the uterus were collected as described by Azawi and Ali (1995). Briefly, Swabs were introduced in the uterus through the cervix by a sterile gloved hand to minimize the risk of contamination. Then, each swab was inoculated into nutrient broth and incubated for 24h at 37°C. After that, Loopfuls were subcultured onto Manitol salt agar, Blood agar, Eosine methylene blue, MacConkey's agar, and Nutrien agar. Then, the plates incubated for 24 h. Bacterial identification was based on the characteristic of colony, Gram-staining and morphology (Lenett *et al*., 1985).

Treatment of uterine infection

Examined cows were randomly divided into five groups. Group A (n=15), was treated by 10% oxytetracycline dissolved in 50 ml distilled water (D.W) for one day. Animals in group B (n = 18) were treated by 2% lugols iodine dissolved in 50 ml D.W. for one day. Group C (n = 22) were treated by 2 ml of penicillin combined with streptomaycin for one day. Animals in group D (n = 7) were treated by i.m. injection of 1 ml per 10 kg live weight gentamycin for one day. Group E (n = 26) were treated by 0.5 gm safapirin for one day. After that, i.m. injection of 5000 I.U. of LH was applied for the experimental groups.

Results

This study revealed that predisposing factors was led to uterine infection in cows, which involved retained placenta, dystocia, milk

Table (1): Predisposing factors of uterine inflammation in the infected cows.

Predisposing factors	Number of cases	Percentage
Retention of placenta	46	52.27
Dystocia	18	20.45
Milk fever	6	6.81
Abortion	7	7.95
Ketosis	6	6.81
Un known causes	5	5.68
Total	88	100

fever, abortion, and ketosis. Retained placenta and dystocia was the most prevalent predisposing factor in cows suffering from metritis as it represented 52.27% and 20.45%, whereas abortion and ketosis were account about 7% and 6%. Bacteriological exanimation revealed that *E. coli*, *Staphylococcus pyogens*, and *Proteus vulgaris* were 40%, 20.45%, and 13.63% respectively, the most prevalent bacteria in uterine lumen cows suffering from metritis. *Streptococcus* spp. and *Corynbacterium pyogens*, were also considerably prevalent bacteria in uterine infection as 7.95% and 6.81%, whereas *Pseudomonas aeruginosa* was about 5.68% (Table 2). This study also showed that *E. coli* with turbid secretion accounted about 66.66% (Fig. 1A) and *S. pyogens* with pyogenic secretion accounted about 50% (Fig. 1B), whereas *Streptococcus* spp. with pyogenic chips secretion was approximately 71.42%.

Antibiotic therapy revealed that safapirin (Fig. 2) and penicillin-streptomaycin were the most effective in treating metritis as 84.61% and 81.81%, respectively. Lugols iodine and oxtetracycline, were also considerably effective in treating metritis as they represented 61.11% and 60.00%, whereas gentamycin intramuscularly accounted for ~28.57% (Table 3).

Table (2): Types of bacteria isolated from the uterine secretions.

Type of bacteria	Total isolation		Turbid secretion		Pyogenic secretion		Pyogenic chips secretion	
	No . isolation	%	No. isolation	%	No.of isolation	%	No. isolation	%
E. coli	36	40	24	66.66	7	19.44	5	13.88
P. vulgaris	12	13.63	7	58.33	4	33.33	1	8.33
C. pyogens	6	6.81	2	33.33	2	33.33	2	33.33
S. pyogens	18	20.45	4	22.22	9	50	5	27.77
P. aerugenosa	5	5.68	3	60	1	20	1	20
Streptococcus spp.	7	7.95	1	14.28	1	14.28	5	71.42
Negative culture	4	4.54	2	50	1	25	1	25

Fig. 1: Uterine Infection Cow; A: Turbid secretion, B: Pyogenic secretion.

Table (3): Number of infected cows and their treatments.

Experimental groups	Antibiotics therapy	No. responses cows	Percentage%
A (N=15)	oxytetraycline	9	60
B (N=18)	Lugols iodine	11	61.11
C (N=22)	Pen-streptomycin	18	81.81
D (N=7)	gentamycin	2	28.57
E (N=26)	Sefapirin	22	84.61

Fig. 2: Clinical recovery in cow.

Discussion

The present work was enabled to identify the predisposing factors leading to uterine infection in cows and treated of uterine infection based on intrauterine or systemic antibiotic administration, followed by one injection of LH. The present study revealed that predisposing factors leading to uterine infection in cows involve retained placenta, fetal dystocia, milk fever, abortion, and ketosis. Retained placenta and dystocia were the most prevalent predisposing factor in cows suffering from metritis. This finding was in agreement with previous study conducted in dairy cows (Arther *et al*.,1989), where the risk factors for uterine infection include retained fetal membranes and fetal dystocia. Fetal dystocia might occur when the

fetus is too large for the pelvic opening, abnormally positioned, the fetus is swelled or the presence of embryonic membranes inside the uterus (Lowder, 1993).

Bacteriological exanimation revealed that *E. coli* was the most prevalent bacteria in uterine lumen cows suffering from metritis. This finding was agreements with previous studies conducted in dairy cows (Mollo *et al*., 1997; Amrose *et al*., 1986), where metritis in dairy cows were associated with bacteriological contamination. It has been found that *E. coli* usually asserts itself at the beginning of inflammation with their endotoxins resulting in mucous and pyogenic secretions (Lohuis *et al*., 1994). *Staphylococcus pyogens*, *P. vulgaris*, *Streptococcus* spp., *C. pyogens*, and *Pseudomonas aeruginosa* were also associated with metritis. This finding is in agreement with previous studies conducted in dairy cows (Dohmen *et al*., 1995a; Mateus *et al*., 2002), where streptococci, staphylococci, *Proteus* or *Clostridium* spp. were reported to associate with metritis.

Antibiotic therapy revealed that administration of safapirin as well as LH was seemed to be effective for the treatment of metritis and improved fertility. This finding agrees with previous study conducted in dairy cows (Dohmen *et al*., 1995b), in which uterine infection has improved when treated with intrauterine infusion of safapirin, relative to receiving different type of antibiotic such as oxytetracycline or penicillin . It has been found that intrauterine infusion of oxytetracycline or penicillin did not improve the reproductive performance compared to untreated control (LeBlanc *et al*., 2002).

Conclusions

Retained placenta is common after parturition in dairy cows and cause considerable infertility. Uterine infection is prevalent in dairy cows and required prompt diagnosis and treatment. Metritis can be successfully treated either by systemic or intrauterine antibiotic administration. Administration of safapirin and luteinizing hormone was seemed to be effective for the treatment of metritis and improved fertility.

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