Mansoura Veterinary Medical Journal

DIAGNOSIS OF ENDOMETRITIS USING ULTRASOUND AND LOW – VOLUME UTERINE FLUSH IN ARABIAN MARES

El Atafy, W.A.[1], Montaser, A.M.[2], El-Sheikh, H. A.[2]

[1]Brooke Hospital for Animals Charity, Mansoura Office, Egypt
[2]Theriogenology Department, Faculty of Veterinary Medicine, Mansoura University, Egypt

ABSTRACT

Endometritis is one of the most common causes of infertility in mares. Many mares fail to be diagnosed despite availability of many diagnostic tests. The objectives of this study were, to diagnose endometritis in Arabian mares by ultrasonography, cytological smear and microbial culture, in addition to applaying of antimicrobial susceptibility test of the isolated bacteria from mares' uteri. This study conducted on 32 Arabian mares with fertility problems. All mares firstly scanned by ultrasound then sampled by low - volume uterine flush for cytological, microbial culture examinations and susceptibility test. E. Coli was found to be the most frequently isolated bacteria (40.54%). While, Proteus Spp. was the lowest frequently isolated bacteria (2.70 %). Ciprofloxacin and enrofloxacin are the highly effective antibiotics inhibiting majority of bacterial isolates. So, the low – volume uterine flush technique is a reliable, easy, quick and practical diagnostic method for endometritis in mares when combined with ultrasonography and microbiology diagnostics.

Key words: Endometritis, Mare, Ultrasound , Uterine cytology.

INTRODUCTION

It has suggested that the equine species inherently achieves relatively low fertility and its domestication makes the situation worse. **(Ricketts and Troedsson, 2007).** Endometritis was ranked in a survey of 1149 veterinarians as the third most frequently occurring reproductive problem in adult horses, and the problem continues to be one of the most economically important problems in equine reproductive management as it is a major cause of subfertility in the mare **(Traub-Dargatz et al., 1991 and Watson, 2000).**

Endometritis is a failure of the uterus to remove foreign contaminants (e.g. bacteria, debris, deed spermatozoa, intrauterine fluid) resulting in inflammation of the inner lining (endometrium) of the uterus **(Watson, 2000).** Mares with subfertility problem often their uterus retain fluid at 24 or 48 h after breeding, while fertile mares successfuly cleare excess fluid within 6 or 8 h after breeding **(LeBlanc, 2003)**.

Bacterial uterine infections induce major losses in the equine breeding populations in about 25 – 60 % of barren mares. Losses can appear as failure to conceive, early foetal losses, mid-gestational abortion, placentitis, birth of septic neonate, postpartum metritis or delays in re-breeding **(Traub-Dargatz et al., 1991 and LeBlanc and Causey, 2009).**

Classical symptomes of endometritis may include intrauterine fluid, unusual endometrial edema, vaginitis, vaginal discharge, abnormal estrous cycles, and cervicitis. In addition, positive endometrial cytology and a positive endometrial culture. However, some or all these signs may be absent in subclinical cases **(LeBlanc and Causy, 2009).**

The highly common and frequently isolated bacteria causing bacterial endometritis are Streptococcus equi subsp. zooepidemicus, Escherichia coli, Staphylococcus aureus, Klebsiella pneumonia and Pseudomonas aeruginosa **(LeBlanc, 1999; Szeredi et al., 2003 and Frontoso et al., 2008).**

Antibiotics are usually used for endometritis treatment **(Perkins, 1999).** However, the bacterial species isolated, as well as their susceptibility to antibiotics, may change over time as well as from one population of horses to another **(Sternberg, 1999).** The purpose of the present study was to study and evaluate the common techniques used for diagnosis of the subfertile mares, define the most common bacterial species inducing endomtritis in problem mares, and determine the antimicrobial sensitivity pattern of isolated bacteria.

MATERIALS AND METHODS

Animals:

Thirty two Arabian mares from different small scale breeding farms in Giza province, Egypt were included in this study. Mares aged 3 – 25 years with fertility problems and had a history of previous failing to conceive after more than three consecutive breeding cycles in one breeding season (February 2015 – Octobr 2017). Animals were kept and raised under quite similar nutritional and managemental systems of housing, feeding, and aspects of breeding regimes.

Reproductive examination and samples collection:

1-Reproductive history and physical examination:

A full reproductive history of mares was recorded which included the age, parity, date and circumstances of last foal, purperium, regularity of estrous cycle, characters of estrous secretion, number of previous mating without conception, date of last service. The general physical examination concentrated on systemic problems and body condition.

2. Ultrasonographic examination:

Before scanning, the mares were completely restraint and secured . All mares were examined transrectally by ultrasonography (SonoScab A5, China) with 7 MHz linear transducer for examining the reproductive tract. The degree of inflammation was demonstrated by the level of endometrial oedema and the volume and characters of retained intrauterine fluid. The presence of 2 cm or more of echogenic intrauterine fluid was taken as an indicator of endometritis.

3. Low – Volume uterine flush sampling:

The low–volume uterine flush samples were collected according to **LeBlanc et al., (2007).** The flush samples were collected using a sterile and disposable Rail's tube

(ULTRAMED Rail's tube 14 FG, Egypt) which is a feeding polyethylene tube for human patients.

4. Cytological diagnosis:

After sampling and preparing the cytological smears as described by **LeBlanc et al., (2007)**.The cytological specimens were fixed immediately and stained within 6 hours with (DIF- QUICK III stain, VERTEX, Egypt). The smears were examined with light microscopy (Optica, 180 K, Italy) under oil immersion (1000 x). Smears were considered indicative of inflammation if there was an average of 1 - 2 neutrophils per magnification in 10 HPF fields.

5 . Bacteriological culture and identification of isolated Bacteria:

For proper bacteriological detection, samples were cultured on Nutrient agar, Sheep blood agar, MacConkey agar and EMB media. The plates were incubated aerobically for 24 – 48 h at 37 ℃. The incubated plates were been examined for morphological character, pattern of hemolysis on sheep blood agar and pigment production on nutrient agar. If > 90 % of the grown colonies in plate were of one species, the result was considered positive and pure growth in monoculture. Growth of two types of colonies in pure culture considered positive and mixed infection. Growth of more than two types of colonies considered as contaminated sample. Gram stain and biochemical tests were performed for identification of the isolated bacteria **(Quinn et al., 1994 and Langoni et al., 1997) .**

6 . Antimicrobial susceptibility test:

The susceptibility test was done for 10 antimicrobial discs (Oxoid) commonly used for treatment of equine endometritis **(Forbes et al., 1998)**. The interpretations of the sensitivity results were read according to National Committee for Clinical Laboratory Standards (2002).

RESULTS

By ultrasonographical examination, 29/32 (90.63%) of mares showed endometritis. In addition, 19/32 (59.37%), 31/32 (96.87%) of mares were positive by cytological and microbial examination respectively **(Table 1)**.

Table 1: Incidence of mares affected with endometritis by different diagnostic methods:

Diagnostic Method	Number Of Mares	Percentage %
Ultrasonography	29/32	90.63 %
Cytology	19/32	59.37 %
Microbiology	31/32	96.87 %

Types of bacteria recovered from the uterine flush samples as well as their frequency of isolation shown in **(Fig 1)**. The results recorded positive bacteriological culture in 96.87% (n=32). Only one uterine flush sample showed no growth 3.13% (n=32).

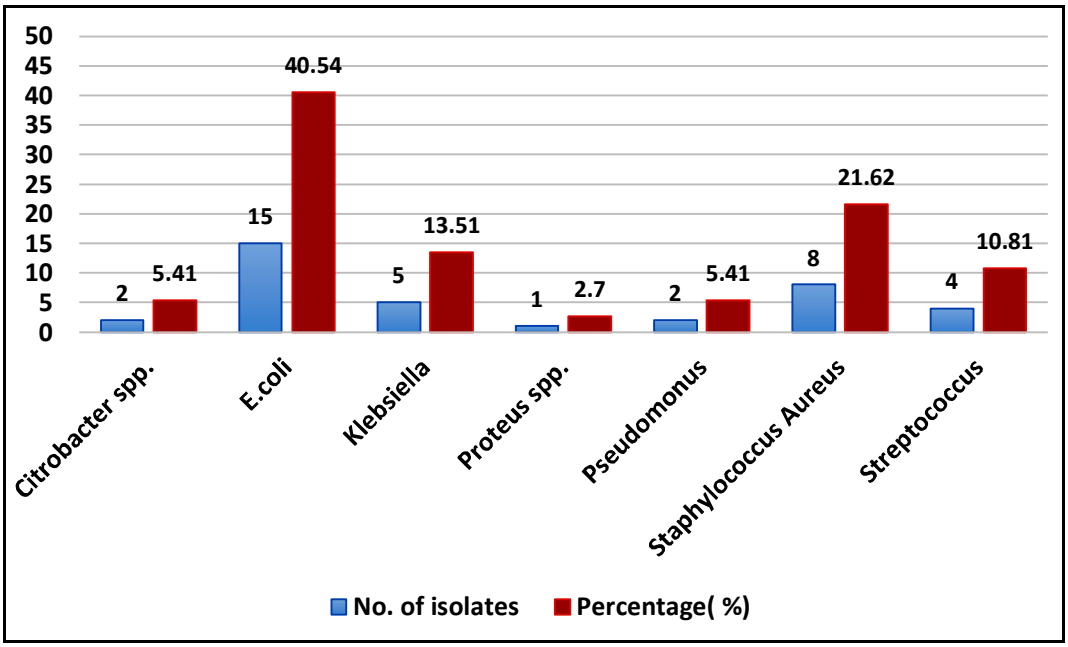

Figure 1: Number and percentage (%) of different types of bacteria isolated from the uterine flush samples (n=32)

Ciprofloxacin and enrofloxacin inhibited the majority of isolated bacteria (E. Coli, Staph. Aureus, Klebsiella, Streptococcus, Pseudomonus, Citrobacter spp. and proteus spp.) as shown in **(Table 2).**

Table 2 : Show the results of antibiotic sensitivity test of isolated bacteria to 10 types of antibacterial agents:

Antibiotic Discs	E. coli			Klebseilla			Pseudomnus			Proteus			Citobacter			Staph. aureus			Streptococcus		
	S	R	I	S	R	I	S	R	I	S	R	I	S	R	I	S	R	I	S	R	I
AMC	0	100	0	0	60	40	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0
AM	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0
K	73.3	26.7	0	80	20	0	0	100	0	0	100	0	50	50	0	0	100	0	0	100	0
E	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0
SXT	80	20	0	40	60	0	0	100	0	100	0	0	50	50	0	50	50	0	0	100	0
T	46.7	53.3	0	0	100	0	0	100	0	100	0	0	100	0	0	25	50	25	100	0	0
ENR	86.7	13.3	0	100	0	0	100	0	0	100	0	0	100	0	0	75	25	0	100	0	0
CIP	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	87.5	12.5	0	100	0	0
CN	73.3	26.7	0	60	40	0	100	0	0	100	0	0	100	0	0	0	100	0	0	100	0
P	0	100	0	0	100	0	0	100	0	0	100	0	0	100	0	0	75	25	25	75	0

AMC: Amoxicillin Clavulanic Acid. AM: Ampicillin. K: kanamycin. E: Erythromycin. SXT: Sulphamethoxazole Trimethoprim. T: Tetracycline. ENR: Enrofloxacin. CIP: Ciprofloxacin. CN: Gentamycin. P: penicillin G. (S = Sensitive / R = Resistant / I = Intermediate)

DISCUSSION

The result of this study revealed that 31 (96.87%) mares, were suffered from bacterial endometritis, which was confirmed with the support of ultrasonography and cytology test. Therefore, bacterial endometritis still a main field problem in the mare's breeding practice. These results were mentioned by **Traub-Dargatz et al. (1991) and Nikolakopoulos and Watson (1999),** where they revealed that bacterial endometritis is the most common cause of subfertility problem and induce major losses in the broodmare practice in 25 – 60 % of barren mares.

Due to the disadvantages of using one diagnostic technique alone for diagnosing endometritis in equine breeding practice, the diagnosis was achieved by Ultrasonography, Microbial culture and Cytology to decrease the susceptibility of occurrence of either false negative or false positive results. This come in agreement with **Riddle et al. (2007); LeBlanc and Causey (2009) and Overbeck et al. (2011).** They hypothesized in their studies that combining diagnostic methods into reproductive examination sheet would increase confidence in diagnosing mares with endometritis. Also, they stated that both uterine culture and cytology are common diagnostic techniques for diagnosing equine endometritis through their respective detection of uterine bacterial infection and inflammatory cells (neutrophils). Using low- volume uterine flush for bacteriological and cytological examinations other than uterine swabs. This was stated by **LeBlanc et al. (2007) and Diel De Amorium, M. et al. (2016),** where they concluded in their study that the low- volume flush technique was a rapid, sensitive and practical test for diagnosing endometritis in chronically infertile mares based on its sensitivity and specificity estimates 0.75 % and 0.9 % respectively**.**

The usage of ultrasonography became an important and valuable diagnostic tool for diagnosing equine endometritis. This finding was in agreement with **Liu and Troedsson (2008).** They found before the use of ultasonography, it was difficult to diagnose the presence, character or the amount of the accumulated uterine fluid.

The present study includes 32 mares with fertility problems, where 31 (96.87%) of the examined mares yield positive bacteriological results. **Frontoso et al. (2008)** stated that bacterial pathogens are considered a main causes of a mare's failure to conceive to a known and fertile stallion in a well– managed breeding equine farm during one or more consecutive breeding cycle in the same breeding season. In addition, **Redaelli and Codazza (1977) and Ricketts et al. (1993)** recorded values of 30 % and 39 % of bacterial isolation respectively. While recently, **Baranski et al. (2003) and Frontoso et al. (2008)** reported values of 66.2 % and 49 % respectively. No growth was recorded in one sample (3.13 %) of flush samples examined. E.coli was found to be the dominant and most common uterine pathogen (15 isolates, 40.54 %) followed by Staph. aureus (8 isolates, 21.7 %), Klebsiella pnuemoniae (5 isolates, 13.51 %), Streptococcus spp. (4 isolates, 10.18 %), Pseudomonus aruginosa and Citrobacter spp. are (2 isolates, 5.41 %) for each and lastly Proteus spp. (1 isolate, 2.70 %). However, E.coli was found to be more associated with repeat breeding endometritis without clinical signs. These findings were in agreement with results of **Albihn (1998); Albihn et al. (2003); Ghasemzadeh-nava et al. (2004); LeBlanc et al. (2007) and Kwon et al. (2012).** They mentioned that E.coli is the overall and most frequently isolated pathogen from uteri of

repeat breeding mares and mostly accompanied by repeat breeding problems other than clinical symptoms. While, the result of this study was disagreed with the results of **Asbury and Lyhe (1993); Langoni et al. (1997); Szeredi et al. (2003) and Frontoso et al. (2008),** where, Streptococcus zooepidemicus was the dominant pathogen causing bacterial endometritis in mares, followed by E.coli. These disagreed results may be attributed to the different study area and horse population.

Staphylococcus aureus was found to be the second isolated bacteria from mare's uteri with fertility problems (8 isolates, 21.62%). By **Shin et al. (1979) and Ricketts et al. (1993)** Staphylococcus aureus was found to be a rather frequently isolated bacterium from uteri of normal population mares. Also, **Frontoso et al. (2008)** mentioned that Staph. aureus may lead to fertility problems in mare's uterus. But, it was concluded by **Allen and Pycock (1989) and Asbury and Lyle (1993)** that Staph. aureus is a less common cause of equine endometritis.

Cytological diagnosis for detection of polymorphonuclear cells (PMNs) in a stained smear from the surface of the endometrium considered an easy technique for rapid diagnosis of uterine inflammation under practical field conditions **(LeBlanc et al., 2007 and Diel de Amorim, M. et al., 2016)**. Cytological diagnosis yielded positive in 59.37% (n=19) and negative in 40.63 % (n=13) of suspected mares to have endometritis.

The usage of antibiotic drugs for treating mare with endometritis is a common field approach, where using these antibiotics by the conventional route of treatment became clearly unsuccessful. Therefore, the antibiotic susceptibility test was performed to pathogens isolated from the bacteriological cultures **(Albihn et al., 2003 and Frontoso et al., 2008)**. The present study's findings of antibiotic sensitivity revealed that, 15 E. coli isolates showed an obvious resistance to each amoxicillin/Clavulanic acid, Erythromycin, Ampicillin and penicillin G antibiotic agents. While the clear and highest sensitivity was recorded for Ciprofloxacin, Enrofloxacin and Sulphamethoxazole /Trimethoprim with 100 %, 86.7% and 80 % respectively. This result was in a complete agreement with the result of the retrospective study of **Frontoso et al. (2008).** They found Enrofloxacin was the only of tested 10 antibiotics no resistance was recorded for E. coli isolates. They recorded from the 64 E. coli isolates of their study, 73.5 % were inhibited by Enrofloxacin. Also, E. coli was susceptible to Kanamycin (67.2 % isolates inhibited) and Gentamycin (73.5 % isolates inhibited). Moreover, the four isolates of hemolytic E. coli were highly susceptible to Enrofloxacin, Kanamycin, Gentamycin and Trimethoprim/ sulphamethoxazole and being highly resistant to Ampicillin and Penicillin G antibiotics. Staph. aureus susceptibility results showed that Ciprofloxacin, Enrofloxacin and Sulphamethoxazole/Trimethoprim were found the highly susceptible and effective antibacterial agents with 87.5 % and 75 % respectively. While, Staph. aureus was found to be highly resistant to Amoxicillin/Clavulanic acid, Ampicillin, Kanamycin, Erythromycin, Gentamycin and Penicillin G. **Frontoso et al. (2008)** reported that the 26 Staph. aureus isolates were inhibited, 96.2 %, 92.4 %, 92.3 % and 88.6 % by Amoxicillin/Clavulanic acid, Enrofloxacin, Gentamycin and Rifampicin respectively. The results disagreed with **Shin et al. (1979).** They found that all streptococcal isolates were highly susceptible to β-lactam antibiotics. Also, **Albihn et al. (2003)** reported that among 31 β- haemolytic streptococcal isolates resistance was clear to Gentamycin and Oxtetracyclin. While, isolates were sensitive to β-lactam antibiotics (Penicillin G and Ampicillin and also to Erythromycin and chloramphenicol). The two Pseudomonas aeruginosa isolates were resistant to the

majority of the tested antibacterial agents (Amoxicillin/Clavulanic acid, Ampicillin, Kanamycin, Erythromycin, Sulphamethoxazole Trimethoprim, Tetracycline and Penicillin G), except the 3 (Enrofloxacin, Ciprofloxacin and Gentamycin) antibacterial agents with 100 % for all. This result was agreed with that of **Frontoso et al. (2008).** They recorded 14 P. aeruginosa isolates that were resistant to the majority of the tested antimicrobial agents except to Gentamycin. The results of the antimicrobial sensitivity test indicates that Ciprofloxacin ranked all over the 10 tested antibiotics. This was confirmed by study to **Trundell et al., (2016)**. They concluded that, intrauterine infusion of 600 mg of Ciprofloxacin resulted in endometrial tissue and intraluminal concentrations that exceeded minimal inhibitory concentrations of E. coli, K. pneumoniae, P. aeruginosa, and S. equi subsp. Zoo epidemicus. No local or systemic adverse effects after intrauterine infusion were recorded and recommended that Ciprofloxacin administration be limited to cases in which the organism is resistant to other antimicrobial agents. Moreover, enrofloxacin which not recommended for use as intrauterine therapies in equine reproductive practice. As both drugs are very irritant to the genital tract, they were the drugs of choice as a result of antibacterial susceptibility.

The present study concluded that the compined use of ultrasonographic, cytological and bacteriological diagnostic techniques is more sensitive and beneficial for accurate diagnosis of fertility problems, E.coli is the dominant and most frequently isolated bacterium species that mostly associated with repeat breeding problems than clinical signs, Ciprofloxacin and Enrofloxacin were the only antimicrobial to which the majority of common endometritis pathogens had no resistance. With respect to gentamicin which inhibit some isolated bacterial species of uterine infections.

REFERENCES

Albihn, A. (1998): Microbiology of uterine infections in Sweden. Equine Vet. Data, 18:511.

Albihn, A., Baverud, V. and Magnusson, U. (2003): Uterine microbiology and antimicrobial susceptibility in isolated bacteria from mares with fertility problems. Acta Vet. Scand., 44:121-129.

Allen, W.R. and Pycock, J.P. (1989): Current views on the pathogenesis of bacterial endometritis in mares. Veterinary Record 125, 241–262.

Asbury, A.C. and Lyhe, S. K., (1993): Infectious causes of infertility. In McKinnon AO, Voss JL (edrs): Equine Reproduction, Malvern, Lea &Febiger, pp 381-391.

Forbes, B.A.; Sahm, D.F. and Weissfeld, A.S. (1998): Diagnostic Microbiology 10th Ed. Mosby, USA.

Frontoso, R., De Carlo, E., Pasolini, M.P., van der Meulen, K., Pagnini U., Iovane G. and De Martino, L. (2008): Retrospective study of bacterial isolates and their antimicrobial susceptibilities in equine uteri during fertility problems. Research in Vet. Science, 84:1–6.

Ghasemzadeh-nava, H., Ghasemi, F., Tajik, P. and Shirazi, A. (2004): A review of Mare Endometritis in Iran. Jornal of Equine Veterinary Science, 24 (5): 188-192.

Kwon, Y., Choi, K. and Cho, J. (2012): Effect of uterine bacteriology and cytology on fertility in Thoroubred mares. Agricultural Journal, 7(4): 245-249.

Langoni, H., Alvarenga, M.A., Papa, F.O., Sakamoto, C., Baldini, S. and Listoni, F.J.P. (1997): Aerobic, microaerobic and anaerobic bacteria in equine endometritis. Pferdeheilkunde 13, 548.

LeBlanc, M.M. (1999): Diseases of the uterus. In: Colahan, P.T., Merrit, M., Moore, J.N., Mayhew, I.G.J. (Eds.), Equine Medicine and Surgery. W.B. Saunders Company, Philadelphia, pp. 1165–1173.

LeBlanc, M.M. (2003): Persistent mating induced endometritis in the mares: pathogenesis, diagnosis and treatment. In: Ball, B.A. (Ed.), Recent advances in Equine Reproduction. International veterinary information service, Ithaca, New York, USA.

LeBlanc, M.M. and Causey (2009): Clinical and Sublinical Endometritis in the mare: both threats to fertility. Reprod Dom Anim, 44: 10-22.

LeBlanc, M.M., Magsig, J. and Stromberg, A.J. (2007): Use of a low-volume uterine flush for diagnosing endometritis in chronically infertile mares. Theriogenology; 68:403–412

Liu, I.K.M. and Troedsson, M.H.T. (2008): the diagnosis and treatment of endometritis in the mare: yesterday and today. Theriogenology, 70: 415-420.

Morel, D.M.C.G. (2003): mare infertility. In: Equine Reproductive Physiology, Breeding and Stud Management. 2nd (Ed), CAB International, London, UK, P. 277-294.

Nikolakopoulos, E. and Watson, E.D. (1999): Uterine contractility is necessary for the clearance of intrauterine fluid but not bacteria after bacterial infusion in the mare. Theriogenology.52:413-423.

Overbeck, W., Witte, T.S. and Heuwieser, W., (2011): Comparison of three diagnostic methods to identify subclinical endometritis in mares. Theriogenology 75, 1311–1318.

Pekins, N.R. (1999): Equine reproductive pharmacology. Vet Clin. North Am. Equine pract, 15: 687 – 704.

Quinn, P.J., Carter, M.E., Markey, B. and Carter, G.R. (1994): Clinical veterinary microbiology. London, United Kingdom: Wolfe.

Redaelli, G. and Codazza, D. (1977): The incidence, pathogenicity and pathology of bacteria and fungal species in the mare's uterus. Folia Vet. Lat. 8: 198-204.

Ricketts, S.W. and Troedsson, M.H.T. (2007): Female Reproductive Problems: diagnosis and management, Fertility Expectations And Management For Optimal Fertility. In: Samper, J.C., Pycock, J.F. and Mckinnon, A.O. (Edrs.), Current Therapy in Equine Reproduction. Saunders Elsevier, St Louis, CA, PP: 53-69.

Ricketts, S.W., Young, A., and Medici, E.B. (1993): Uterine and clitoral culture. In: Equine reproduction. Eds: MeKinnon, A.O. and Voss, J.L. Les and Febinger, Philadelphia, USA, PP. 234-245.

Riddle, W.T., LeBlanc, M.M., and Stromberg, A.J. (2007): Relationships between uterine culture, cytology and pregnancy rates in a Thoroughbred practice. Theriogenology (68): 395-402.

Shin, S.J.; Lein, D.H.; Aronson, A.L.; Nusbaum, S.R.; (1979): The bacteriological culture of equine uterine contents, in vitro sensitivity of organisms isolated and interpretation. Journal of Reproduction and Fertility 27 (Supplement), 307–315.

Sternberg, S. (1999): Antimicrobial resistance in bacteria from pets and horses. Acta vet. Scand. Suppl., 92: 37 – 50.

Szeredi, L.; Tenk, M.; Schiller, I. and Revesz, T. (2003): Study of the role of Chlamydia, Mycoplasma, Urea plasma and other microaerophilic and aerobic bacteria in uterine infections of mares

with reproductive disorders. Acta. Vet. Hung. 51: 45–52.

Traub-Dargatz, J.L., Salman, M.D. and Voss, J.L. (1991): Medical problems of adult horses, as ranked by equine practitioners. J. American Vet. Med. Assoc., 189: 1745-1747.

Trundell A. D., Ferris, A. R, Hennet, R. M., Wittenburg, A. L., Gustafson, L. D., Borlee, R. B. and McCue, M. P.(2017): Pharmacokinetics of Intrauterine Ciprofloxacin in the Mare and Establishment of Minimum Inhibitory Concentrations for Equine Uterine Bacterial Isolates. Journal of Equine Veterinary Science (54) 54–59.

Watson, E. D. (2000): Post-breeding endometritis in the mare. Animal Reproduction Science 60–61. 221 – 232.

الملخص العربي

تشخيص التهاب بطانة الرحم باستخدام الموجات فوق الصوتيه و الغسيل الرحمى فى الأفراس العربيه

وليد العطافى[1] وعبد المنعم منتصر[2] وحسام الشيخ[2]

جمعية مستشفى بروك الخيرى لعلاج الحيوان [1]

قسم التوليد والتناسل والتلقيح الاصطناعى- كلية الطب البيطرى- جامعة المنصورة[2]

الألتهاب الرحمى هو أكثرالأسباب لنقص الخصوبه فى الأفراس و ذلك بسب عدم امكانية تشخيص ذلك الالتهاب فى بعض الأحيان على الرغم من توافر العديد من وسائل التشخيص. و كانت أهداف تلك الدراسه هى تشخيص التهاب بطانة الرحم البكتيرى فى الأفراس بوسطة كلا من الموجات الفوق صوتيه، الفحص السيتولوجى لخلايا التهاب بطانة الرحم كذلك عزل و تصنيف لتلك الميكروبات و اجراء اختبارحساسيه المضادات الحيويه المستخدمه فى علاج ذلك الألتهاب. و أجريت تلك الدراسه فى عدد ٣٢ من أفراس الخيل العربى الأصيل التى لديها مشاكل فى الخصوبه و تم تشخصيها بواسطة أولا الموجات الفوق صوتيه ثم أخذ عينات رحميه بطريقة لو فوليم يترين فلش لعمل اختبار الزرع البكتيرى و الفحص السيتولوجى لخلايا التهاب بطانة الرحم. لقد وجد ميكروب الايشرشيا كولاى هو الميكروب السائد و الأكثر تكرارا بعدد ١٥ معزوله بنسبة (٤٠،٥٤%) تبعه الميكروب العنقودى (استاف أوريس) بعدد ٨ معزولات بنسبة (٢١،٦٢ %) ثم كلا من ميكروب الكلبسيلا نيمونى ، الميكروب السبحى (ستربتوكوس) و كلا من ميكروب سودومونس سيتروبكتر بعدد ٥ ، ٤ و ٢ معزولات و نسبة (١٣،٥٧ %) ، (١٠،٨١ %) و (٥،٤١ %) على التوالى. و كان ميكروب البروتيس الأقل تكرارا بعدد ١ معزوله و نسبة (٢،٧٠ %). كما أظهر اختبار الحساسيه أن كلا من سيبروفلوكساسين و الأنروفلوكساسين هما المضادان الحيويان الأكثر تأثيرا على الميكروبات المعزوله. كذلك أظهرت النتائج أن الغسيل الرحمى بكميات صغيره تعتبر طريقه سهله و سريعه لتشخيص الالتهاب الرحمى فى الأفراس العربيه بالأضافه الى استخدام الموجات فوق الصوتيه.