



Prevalence of pneumovagina among subfertile Arabian mares in Al-Najaf province / Iraq

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Abstract

This study was conducted in Al-Najaf province / Iraq during 2016 on 51 Arabian subfertile

mares to assess the prevalence of pneumovagina. The cases classified according to caslick's index, and out of 51 examined mares there were 21 (41.17 %), 18 (35.29 %), and 12 (23.52%) mares for grade I, II and III respectively. Moreover, the correlation between the animal's age and the mean of caslick's index, the results showed that there were 64 (15.68 %), 72 (25.49%) and 98 to 123 (35.29% to 23.52 %) for age groups 3-7 years, 7-10 years and more than 18 years respectively. The ultrasonic examination revealed that the mares in grade I mares showed a higher percentage of reproductive system abnormalities and the percentage of was Endometritis (14.28%). While, in mares with grade II, the percentages of vaginitis, Cervicitis, Endometritis, Pyometra and anovulatory follicles, were 22.22 %, 0 %, 38.88 %, 33.33% and 5.55 % respectively. At the same time, the percentages of vaginitis, Cervicitis, Endometritis, Pyometra and anovulatory follicles were 16.66 %, 16.66 %, 0 %, 58.33% and 8.33% respectively the mares with grade III. In conclusion, the results of the present study revealed the prevalence of mare subfertility in mares due to pneumovagina. The author recommend more future studies to correlate between the prevalence of pneumovagina and the causes of uterine infection in mare.

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Key words: Arabian mare, pneumovagina, caslick's index, infertility

Introduction

The mares are characterized by low fertility rate when compared with other farm animals. Therefore, to obtaining a foal per year, both management practices and scientific tactics of breeding play an essential part in equine economic husbandry (Davies Morel, 2008). The infection of the reproductive tract is a major cause of subfertility in the mare while the good reproductive tract conformation is provided

natural protection. However, many mares have poor conformation and arise in the bacterial invasion of the reproductive tract, when the natural defenses are impaired (Newcombe, 2011). The mare's conformation of perineum has a significant role in the protection of the genital tract from the entrance of air. The vulva also acts as the first valuable barrier to fight the external environmental infections and to protect the female reproductive system from ascending infections. (Samper *et al.*, 2007). The vulva lies ventral to the anus. Therefore, it is always at the risk of fecal contamination. The normal vulva is almost vertical in position, while the vulvar lips are opposed. Thus the angle of the vulva should be evaluated concerning the vertical, and its length should compare with the location of the bony pelvis which can palpate by finger pressure on the perineal tissue adjacent to the vulva (Trotter, 1993). Any disorder in the shape and structure of the vulva may compromise the healthy reproductive status of the mare and may lead to infertility (Dascanio, 2014). Malconformation in the vulva causes a condition termed pneumovagina (vaginal wind-sucking) which lead to passage of bacteria into the internal reproductive tract of the mare that may result in bacterial uterine infections (Goncagul, 2016). The caslick's index derived by multiplying the angle of inclination of the vulva with the distance from the ischium to the dorsal commissure. This index can be used to classify mares into three types and so predict the likely occurrence of endometritis. The review of literatures revealed shortage in the published articles regarding the pneumovagina in Arabian mares in Iraq. Therefore, this study intended to evaluate the prevalence of pneumovagina between the subfertile Arabian mares in Al-Najaf province/ Iraq.

Material and methods

Fifty-one Arabian mares were submitted to the private equine clinic in Al- Najaf province during 2016 with the history of the repeated breeder (subfertile mare). The case history was taken, and the urogenital system of each mare examined clinically for vaginal discharge, vestibular fold compatibility, and perineal conformation. The caslick's index was measured by multiplying the length of vulva by the angle of declination in degree obtained by vulvometer (Talluri *et al.*, 2015). The caslick's index was classified into grades as follow: grade I (less than 100), grade II (100-150) and grade III (higher than 150). After evacuation the mare's rectum, the entire genital system was examined by veterinary ultrasound machine using a linear transducer, B mode (7.5 MHz). The examination involving ovaries, uterus, cervix, and vagina. The echogenicity of different parts of the genital system was recognized as described by McKinnon, (1988).

Results

According to caslick's index grading system, out of 51 examined mares there were 21 (41.17 %), 18 (35.29%) and 12 (23.52%) mares in grade I grade II and grade III respectively (Figures 1, 2 and 3) (Table.1).

The results of this study also showed variation according to animal's age and its correlation with the caslick's index. The examined mares were located in different age class/ years as follow: 3-7, 7-10 and over 18 years that showed mean of caslick's

index of 64 (15.68%), 72 (25.49%) and 98 and 123 in (35.29% and 23.52 %) respectively (Table. 2).

Table .1: Reveals the classification of pneumovagina according to caslick's index

Caslick's index	Grades	No. exam mares	Percentages (%)
≤ 100	Grade I	21	41.17
100-150	Grade II	18	35.29
≥ 150	Grade III	12	23.52



Figure.1: Reveals grade I caslick's index with good vulvar conformation
Figure. 2: Reveals grade II caslick's index with moderate pneumovagina



Figure. 3: Reveals grade III caslick's index with poor vulvar conformation

Table. 2: Reveals the mean of caslick’s index according to age classes of studied mare

Age	Caslick’s index	No. of affected Mares	Percentages (%)
3-7	64	8	15.68
7-10	72	13	25.49
11 -17	98	18	35.29
≥ 18	123	12	23.52

The ultrasonic examination also revealed variation according to caslick’s index. The mares in grade I was showed a higher percentage of reproductive system abnormalities that revealed endometritis in a percentage of (14.28%). While, the mares with grade II, revealed vaginitis, Cervicitis, Endometritis, Pyometra and anovulatory follicles and the percentages were 22.22 %, 0 %, 38.88 %, 33.33% and 5.55 % respectively. Moreover, mares with grade III also revealed vaginitis, Cervicitis, Endometritis, Pyometra and anovulatory follicles and the percentage were 16.66 %, 16.66 %, 0 %, 58.33% and 8.33% respectively figure(5,6 and 7).

Table. 3: Reveals diagnosis of genital system by ultrasound examination

Grade	Vaginitis	Cervicitis	Endometritis	Pyometra	Anovulatory
	No.(%)	No.(%)	No.(%)	No.(%)	Follicles No.(%)
Grade I	2 (9.52)	0	3 (14.28)	1 (4.76)	0
Grade II	4 (22.22)	0	7(38.88)	6(33.33)	1 (5.55)
Grade III	2(16.66)	2(16.66)	0	7 (58.33)	1(8.33)

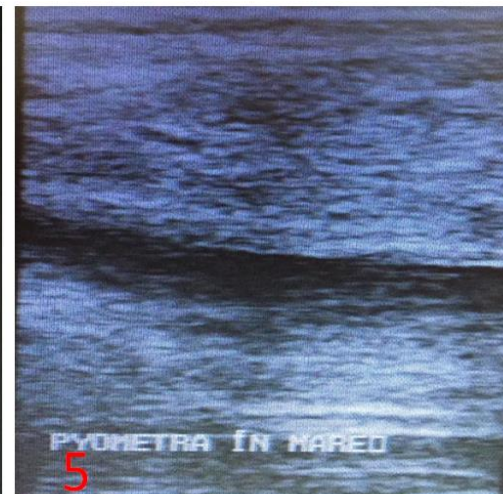


Figure. 5: Reveals the thickness of uterine wall in endometritis

Figure.6: Reveals pyometra, the uterine lumen filled with pus

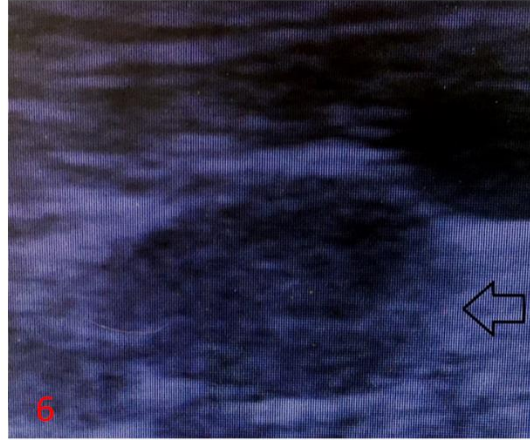


Figure. 7: Reveals anovulatory follicle in mare

Discussion

Pneumovagina means the abnormal presence of air in the vagina, which may lead to pneumometra and endometritis. The main factors that were predisposing to pneumovagina are bad perineal conformation and vestibulovaginal sphincter weakness (Samper *et al.*, 2007). The high prevalence of pneumovagina in Arabian mares involved in mare's reproductive abnormalities particular endometritis. The results of the present study are compatible with previous studies worldwide (Pascoe, 2007; LeBlanc, 2008a; LeBlanc, 2008b). The equine subfertility researchers recorded that the mare with perfect perineal conformation has a vulva vertical with the anus. While in bad perineal conformation the vulva slope and don't form the perfect seal, this defect may predispose vulva to suck air and fecal materials (Easley, 1996; Pycocock, 2001; LeBlanc, 2008a; Goncagul *et al.*, 2016). The present study revealed variations in the caslick's index grading system and out of 51 examined mares there were 21 (41.17 %), 18 (35.29%) and 12 (23.52%) mares in grade I grade II and grade III respectively (Figures 1, 2 and 3). These results are compatible with previous researchers ((Samper *et al.*, 2007; Talluri *et al.*, 2015). Additionally, the results of this study also revealed a variation when correlating animal's age with the caslick's index and these results are in agreement with (Pascoe, 1979; Ebert and Riese, 1986).

The ultrasonic examination is one of the tools that used to diagnosis the pregnancy and also to determine the abnormalities of reproductive system, the results of the ultrasonic examination also showed pathological abnormalities in the examined mares according to caslick's index, and these results are compatible with others (Talluri *et al.*, 2015)

In conclusion, the results of the present study revealed the subfertility in mares with pneumovagina that might occur due to uterine infection, poor body condition, and early embryonic death. The author recommend another future studies to correlate between the prevalence of pneumovagina and the causes of uterine infection in mare.

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