

Original article

Post-partum Period in Tunisian Arab Mares: Which Factors Influence the Foaling Heat? ¹

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Abstract

This work aims to study the influence of some factors on the expression of the foaling heat in Arab mares. This study was held in Tunisia, from January to May 2018. For this, 59 Tunisian Arab mares were separated into 2 groups (young mares, age <15 years, n=41; and old mares, age ≥15 years, n=18), and monitored amid the post partum period. The parturition mode (eutocic, dystocic) was noted, and the onset of the foaling heat and its duration recorded. Follicular activity was monitored using ultrasonography to track the side at which the ovulation occurred. ANOVA was carried out using the software SAS (SAS Institute Inc.®) to study the effect of age and parturition mode on the onset of foaling heat and its duration. The Duncan test was used to compare the variations according to the age and the parturition mode. The onset of the foaling heat and its duration did not vary with the age class (7.5±0.2 vs 7.3±0.2 days; 5±0.5 vs 7.8±0.3 days), but had more important values in mares with dystocia (8±1.2 vs 7.4±0.2 days, p<0.05; 6±1.8 vs 5±0.5 days, p<0.05). Significantly more ovulations occurred in the left ovary than in the right one (55% vs 45%). Furthermore, silent heat occurred at the rate of 20%, while all females resumed an ovulatory function. Our results suggest that dystocia increase the onset delay of the foaling heat and its duration, and that the left ovary tends to retrieve its function faster than the right one.

Keywords: onset of foaling heat, duration, post-partum, factors, Arab mares.

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INTRODUCTION

Mares are known for their long gestation period reaching 330 to 345 days (Stout, 2012) and limited physiological breeding season. For this reason, breeders manage usually to breed mares during their first post-partum heat, to improve the chance of maintaining yearly foal production, and to allow its participation in races or other competitive events. Mare's post-partum period is characterized by the onset of the foaling heat, 5 to 12 days post partum (Loly, 1980) and might lead to the entrance of the fertilized embryo in the uterus lumen before the completion of the uterine involution, and when the ability to maintain pregnancy is compromised (Katila and Reilas, 2001). Several factors can potentially affect the mare's post-partum, and the most commonly encountered are endogenous, leading to fertility mishaps (Turner, 2007).

The objective of the study is to investigate some of these endogenous factors that could influence expression of the foaling heat of the Arab mares.

Material and Methods

Animals

The study was carried out on 59 Arab mares raised in the stud stables of the National Foundation for the Improvement of the Horses Breed, in Sidi Thabet, located in the north of Tunisia (36° 54' 31" north, 10° 02' 33" east), starting from January until May 2018. Mares were divided into 2 age classes: young mares <15 years (n=41), old mares ≥15 years (n=18).

Foaling preparations

Parturition prodrome varies from one individual to another, some mares get nervous and show signs of anxiety, agitation with stretching and general restlessness, while others isolate themselves from the herd, and become unusually quiet, sweating and showing signs of discomfort. Anorexia is often observed in the preparturient mares as anxiety and discomfort conceals any sense of hunger (Nagel et al., 2014).

By the approach of term (2 - 4 weeks before), the herd managers would have acclimated the preparturient mares to the foaling area. In the stud stables of the National Foundation for the Improvement of the Horses Breed, in Sidi Thabet, mares give birth in individual foaling stalls, where they are housed during nights, while exercising and grazing during the day. They are moved in these nurseries long enough to adjust to their new surroundings. The foaling stalls are usually bedded with straw of quality to limit dust emission, and to isolate them thermally. The stall is large enough, to provide enough space for the mare's and the possible interveners moves. Besides, it is clean, quiet, with no draught-winds nor distractions.

Foaling requires also some other preparations, such as braiding neatly or wrapping the mare's tail, in a loose way in order to prevent ischemia and straining hair follicles. Moreover, the perigenital and the udder areas are cleaned with mild soap and warm water at the beginning of the parturition (Shepherd, 2010).

Foaling heat's monitoring

For each mare, the parturition mode (eutocic, dystocic) was noted, and the onset of the foaling heat was recorded according to the follicular activity. The follicular activity was monitored by ultrasonography, using a linear probe to inspect the ovaries and to track the side at which the ovulation occurred. The duration of the foaling heat was determined according to behavioural expression of oestrus.

Mares with no behavioural signs of oestrus are called in "silent heat" or "covert". Usually, these mares develop a normal ovarian cyclic activity, but they lack to exteriorise the signs of sexual receptivity. In order to determine whether the females are cycling shortly after parturition, an ultrasound is carried out to monitor their ovarian activity even when they do not express any signs of oestrus.

Statistical analysis

ANOVA was carried out using the software SAS (SAS Institute Inc.®) to study the effect of age and parturition mode on the onset of foaling heat and its duration. The Duncan test was applied to compare the variations according to the age and the parturition mode. The threshold of signification has been set for $p < 0.05$.

Results

Heat foaling expressions

During the period of study, dystocia recorded 7.5% of all parturitions, and all dystocic mares were affected by placental retention (Figure 1), lasting for more than 4 hours post-foaling. Moreover, the ultrasound monitoring showed that the left ovary tends to ovulate more frequently than the right one since the percentage of ovulation was higher in left side (55% vs 45%, Fig. 2).



Figure 1. Afterbirth retention in an Arab Tunisian mare

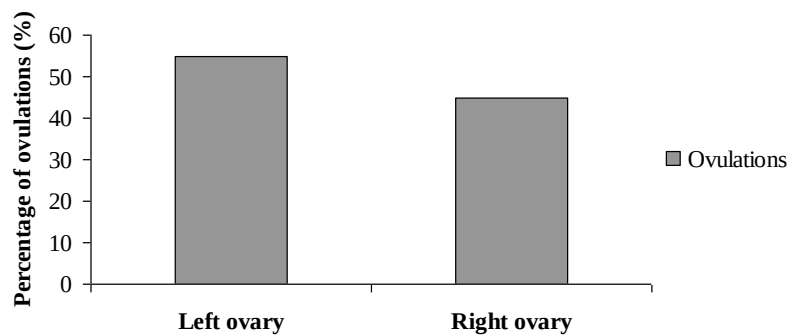


Figure 2. Variation of the percentage of ovulations according to the ovary side

Some mares ovulated without expressing any external sign of oestrus although the ultrasound examinations revealed the existence of a follicular activity close to ovulation. During the post-partum period, only 20% of mares ovulated silently, versus 80% who showed behaviour heat signs (Figure 3).

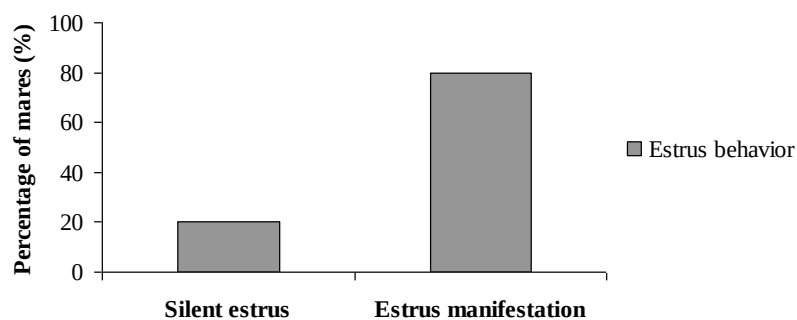


Figure 3. Variation of the percentage of mare according to the type of foaling heat

Onset and duration of foaling heat

The onset of the foaling heat and its duration did not vary with the age class, but had more important values in mares with dystocia (8 ± 1.2 vs 7.4 ± 0.2 days, $p < 0.05$; 6 ± 1.8 vs 5 ± 0.5 days, $p < 0.05$, Table 1).

Table 1. Onset and duration of foaling heat

	Onset foaling heat	Duration of foaling heat
Mares Age		
Young mares <15 years (n=41)	7.5 ± 0.2	5.0 ± 0.5
Old mares ≥ 15 years (n=18)	7.3 ± 0.2	7.8 ± 0.3
Mode of parturition		
Dystocic foaling	8.0 ± 1.2^a	6.0 ± 1.8^a
Eutocic foaling	7.4 ± 0.2^b	5.0 ± 0.5^b

a,b :p <0.05

Discussion

Silent foaling oestrus is usually observed in maiden mares or mares with young foals at foot (England, 2005). In this case, the typical pattern of oestrus behaviour is absent, although physiological changes occur in the ovaries and the genital tract. Special attention should be given to not to confound dioestrus follicles with tertiary follicles in the ultrasound or when a rectal palpation exam is performed (England, 2005). On the other hand, a common cause of silent heat in mares is their maternal instinct dominates their instinct to display oestrus (Parker, 2013).

Walter (2007) advises that mares should not be bred before their tenth day post foaling otherwise the conception rate would be very low. In fact, most mares cycle at 9-10 days post partum but not all do and some mares not show heat until the 12-13 post-partum or even later (Walter, 2007; Parker, 2013). This aspect is physiologically normal, and suggests that a ovarian routine examination should be started at day 4-5 post partum, to provide enough insight to decide when to breed the parturient mare. According to Morel (2008), many stud farms perform a routine examination even within 3 days after parturition to identify problems and check that uterine involution is progressing appropriately.

Regarding dystocia in mare, our results show a low occurrence of dystocic parturition during the whole period of the study. Bhoi et al. (2010) reported that the incidence of dystocia in mare is low when compared to cattle (4%), versus 10.1% advanced by McCue and Ferris (2012) with a higher incidence in the Thoroughbred, while some other studies outlined higher rates of dystocia incidence, such as Squires et al. (2013), who found it to be 13.2%. The most common causes of parturition incidents are the abnormalities of fetal posture (Frazer, 2003; McCue and Ferris, 2012).

In our study, all cases of dystocia were followed by afterbirth retention lasting for more than 4 hours post-foaling, whilst placenta should be delivered 30 minutes to 6-12 hours (Vandeplasse et al., 1970; Provercher et al., 1988). De facto, Ishii et al. (2013) found that placental retention exceeding 3 hours severely affects the reproductive performance at the foal heat. Turner (2007) and Crabtree (2012) report that the complications occurring during foaling could lead to a delay in the uterine involution and therefore affect the onset of the first and even the second heat postpartum, which is compatible with our findings.

On the other hand, dystocia is frequent in young and primiparous mares, so mating should be avoided for the 3 years old females, and breeders should be particularly vigilant in the busy spring months when most foalings occur, for a proven effect of the month of foaling was demonstrated to affect the mode of parturition (Sabbagh et al., 2014).

Conclusions

Our results suggest that dystocia increase the onset delay of the foaling heat and its duration. Therefore, the reproductive performance decreased in the mares which had dysocia and placental retention. It has been proven that the left ovary tends to retrieve its function faster than the right one.

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