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TIME OF OVULATION AFTER TREATMENT WITH HCG IN THE MARE

(With 2 Tables)

By

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**وقت التبويض بعد العلاج بهرمون الجونادوتروفين
المشيمي الأدمى فى الأفراس**

**بوعكاز ع. ، أزروت ر. ، كاميلو ف. ، فانوزى أ. ، روتا أ. ،
رومانبولي س. ، ارياج ج.**

لقد تم إعطاء حقنة وريدية متكونة من 2500 وحدة دولية من الهرمون المحفز للإباضة (hCG) لستة عشرة فرسة من سلالة (Haflinger)، لما بلغ قطر الجريب في مبيضها 31 مم. تم فحص مبيض كل واحدة منها بواسطة "الإيكوغراف" جهاز الأمواج الصوتية ليتم التأكد من وقت عملية الإباضة، في الأوقات التالية: ١٢-٣٤-٣٦-٣٨-٤٠-٤٢-٤٤-٤٦ و ٤٨ ساعة الموالية لحقنة هرمون (hCG). 86,9% فرسة استجابت لهذا الهرمون، وأباضت خلال فترة تتراوح بين ٣٤ و ٤٢ ساعة، و ١٠% فرسة أباضت بصفة تلقائية قبل ٣٤ ساعة من عملية حقن الهرمون المحفز للإباضة، و 2,6% فقط منها أباضت بعد ٤٨ ساعة من الحقن. استعمال الهرمون المحفز للإباضة (hCG)، يؤدي في معظم الحالات، إلى الإباضة الجماعية المتجانسة في وقت قياسي، وهو ٨ ساعات بعد الحقن.

SUMMARY

When a dominant follicle reached 31 mm of diameter, sixteen mares where treated during a total of thirty eight estrus cycles with 2500 IU of hCG IV (hour 0) and scanned at hours 12, 34, 36, 38, 40, 42, 44, 46, and 48 in order to determine the time of ovulation. In 86,9% of the occasions, mares responded to the treatment ovulating between hours 32 and 42, while 10,5% of mares ovulated spontaneously before hour 34 and 2,6% of mares ovulated after hour 48. The use of hCG resulted in most of the ovulations being grouped in a range of only 8 hours.

Key words: *Mare, ovulation, hCG.*

INTRODUCTION

Artificial insemination with frozen semen is more intensively requested by equine breeders. Mares bred with frozen semen are often examined four to six times per day and inseminated immediately before or within 6 h post-ovulation to obtain acceptable fertility (6). In fact, frozen semen has a shorter life span in the mare than fresh semen. Accurate pinpointing of the time of ovulation is very important for successful breeding with frozen semen. One of the biggest problems in the mare reproductive management is the long length of oestrus cycle and the incapacity to determine exactly the time of ovulation. Induction of ovulation in an interval of 24-48 hours after treatment, can be obtained by using hCG (4,3,2,8). The aim of this study is to determine the time of ovulation in an interval enough precise privately to the interval 34-38 hours post-treatment.

MATERIALS and METHODS

During 2001 and 2002 breeding season, thirty-eight oestrus cycles were monitored in sixteen Haflinger mares aged between 2 and 3 years weighing 320-400 Kg. Mares were kept under free the stabulation regimen and received forage ad libitum. No other treatments were given to these cyclic mares except the common prophylactic programmes.

The mares were scanned daily with ultrasound (intra-rectal 5 MHz-linear arrays) in order to determine the oestrus stage and the follicle growth. When a dominant follicle in growth reached 31 mm in diameter and uterine folds corresponding to oestrus were noted, the mare received intravenously 2500 IU of hCG (hour 0). After treatment, mares were ultrasonographically scanned according to the following scheme: hour 12, 34, 36, 38, 40, 42, 44, 46, and 48. As soon as ovulation took place echographic exams were interrupted. Mares that have not ovulated in 48 hours were re-tested ultrasonographically once a day until ovulation was noted.

As a working hypothesis we have classified mares, on basis of the moment of ovulation, in the following categories:

- Early ovulation = ovulation before 34 hours,
- Induced ovulation = ovulation between 34 and 48 hours,
- Late ovulation = ovulation after 48 hours.

RESULTS

Table 1: Distribution of the moment of ovulation after treatment with 2500 IU of hCG IV (N=16 and 38 oestrus cycles)

0-12	12-34	34-36	36-38	38-40	40-42	42-44	44-46	46-48	>48
0 0%	4 10,5 %	18 47,4 %	9 23,7 %	5 13,2 %	1 2,6 %	0 0 %	0 0 %	0 0 %	1 2,6%

Table 1 shows that thirty-three among thirty eight mares corresponding to (86.9%) have respond to the treatment, ovulating between 34 and 48 hours after the inoculation of hCG (induced ovulation), 4/38(10.5%) have ovulated before 34 hours (early ovulation) and finally 1/38 (2.6%) have ovulated after 48 hours (late ovulation).

Table 2: Distribution of the moment of ovulation after treatment with 2500 IU of hCG, IV (N=16 and 38 oestrus cycles) in three successive oestrus cycles.

Cycles	Early ovulation	Induced ovulation	Late ovulation
1	0/15(0%)	15/15(100%)	0/15(0%)
2	4/15(26,66%)	11/15(73,33%)	0/15(0%)
3	0/8(0%)	7/8(87,5%)	1/8(12,5%)

On observing this data we note that all the mares had responded to the treatment and ovulated between the 34 and 42 hours after receiving hCG treatment. No difference was detected corresponding to the moment of ovulation in the first, second or the third treatment.

DISCUSSION and CONCLUSION

The majority of the studied mares (86,9%) have ovulated between 34 and 48 hours after receiving 2500 IU of hCG. These results confirmed those found by Camillo *et al.*, (1999) which have obtained an

ovulation rate of 91% (N= 67 mares) between 24 and 48 hours, Bruyas *et al* (1998) have obtained 80% (N°36 mares). Overall the most important result of this study is that all the mares which have respond to the treatment have ovulated in a short laps time well defined 34-42 hours post-h C G treatment in a strict interval of 8 hours only. If this notion will be confirmed on a biggest pattern in practice, the mare's management using frozen semen can be accurately simplified. We propose this strategy: When the mare is in estrus with a follicle of 31mm in growth it receive 2500 IU of hCG intravenously and it will be inseminate 36 -38 hours after. In this manner the majority of mares can be inseminated in an interval of 6 hours before ovulation and 4 hours after. For mares, which have ovulated before 34 hours (early ovulation) it is considered as a really spontaneous ovulation and may not be considered as real failure of the treatment. In contrast ovulation that occur 48 hours after will be attributed to an immunization of the mare to hCG, which is considered as heterogeneous protein for the equine spice (7- 5). Indeed, it is now established that mares produce anti-hCG antibodies after being treated for 2 to 5 cycles in a row (7- 3).

In our experience we have relieved only one case of late ovulation, which is considered as insignificant percentage and can be explained by the fact that the studied mares were young, and by the fact that those mares have never received hCG treatment at all. It is important to note that the failure of response was noted in the mare which was treated 3 times consecutively by chorionic gonadotropin. Other authors attributed the lack of response to hCG much more to the age of mares rather than the repetition of treatment. About this subject, Zavaglia *et al*, (2000) have note a late ovulation rate of 8,9% in mares aged between 3 and 16 years and 19,5% in mares aged more than 16 years. Otherwise in case of absence of accurate information, the failure of response can be assigned to the possibility that old mares would have been treated many times with hCG and possibly immunized. In this case we try other alternatives like deslorelin, equine LH or GnRh and its analogues.

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