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FAILURE OF FOLLICULAR STIMULATION AND OESTRUS INDUCTION WITH SYNTHETIC GONADOTROPIN RELEASING HORMONE AND PROGESTERONE IN DEEPLY ANOSTRUS ARABIAN MARES

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SUMMARY

Six deeply anestrus Arabian mares associated with small, hard inactive ovaries were treated with synthetic gonadotrophin releasing hormone, GnRH, (Fertagyl) and progesterone (Primolut Depot) to produce the gonadotrophin surges responsible for inducing follicular activity, estrus behavior and ovulation during the breeding season (Spring and Summer). The mares were given intramuscuarly three courses of the synthetic GnRH begining on days 1,11 and 21 of treatment. Each course consisted of 4 injections of 1.0 mg of Fertagyl given at 12 hours intervals. On day 23, animals were given another injection of 1.5 mg of Fertagyl, the mares also received an injections of 150 mg progesterone daily from day 5 till day 16.

Clinical examination of the mares revealed neither ovarian follicular activity nor estrus behavior. It appears that synthetic GnRH and progesterone in deeply anestrus Arabian mares failed to induce cyclic follicular stimulation and estrus behavior.

INTRODUCTION

It is known, that , small, firm inactive ovaries in

mares leading to anestrus during the breeding season may be caused by abnormal hypothalamo- pituitary endocrine function (1,2).

It has been suggested that the synthesis of hypothalamic gonadotrophin releasing hormones can release sufficient FSH and LH to induce follicular growth and ovulation in domestic and laboratory animals (3,4) . Some encouraging results have been reported when synthetic GnRH has been used to hasten follicular development and ovulation in anestrus mares (5) and those with developing or persistent follicles (6).

Evans and Irvine (7) were the first to report the successful use of exogenous GnRH and progesterone to induce follicular development and ovulation in non cycling mares either during the early seasonal transitional period or in deep winter anestrus mares. Allen and Alexeev (8) used a GnRH analogue at a dose and regimen similar to that reported by Evans and Irvine (9) were failed to stimulate follicualr development in deep anestrus pony mares. From the above mentioned review, it appears that there is a fair amount of debate concerning the benefits of exogenous GnRH in anestrus mares with inactive ovaries.

Therefore, this work was undertaken to see if follicular stimulation and estrus could be induced in anestrus Arabian mares during the breeding season using synthetic GnRH and progesterone.

MATERIALS AND METHODS

Six Arabian mares were used in this study, among them, four were from different equine breeding farms, while the other two mares were brought to the clinic of theriogenology department, college of veterinary medicine, university of Baghdad. They were 7-20 years old (as determined by dentation as well as to their clinical histories) and weighed 300-500 kgs and all had previously live foals. They all sufered from reproductive problems during the breeding season of 1987 (Spring and Summer).

Clinical examination of the mares revealed small, hard

inactive ovaries with absence of estrus behavior for more than 3-6 months as determined from the breeding history. They were diagnosed as deep anestrus mares. Treatment commenced by intramuscular injections of three courses of a synthetic gonadotrophin releasing hormone. GnRH, Fertagyl (Intervet International B.V.Boxmeer-Holland.) at a dose of 1.0 mg (10ml) begining on days 1,11 and 21 according to Evans and Irvine, (9). The first course consisted of 4 injections of GnRH given at 12 hours intervals on day 1, and day 2 (day 1 is the day of starting treatment).

The second and third courses were similary given on days 11,12,21 and 22. On day 23, they were also given another injection of 1.5 mg (15ml) of Fertagyl. Mares also received intramuscular injections of 150 mg oily progesterone, Primolut-Depot (Schering AG, Berlin, Bergkamen, Germany). daily from days 5 through 16.

During treatment, mares were teased every 2-3 days for detection of estrus, and examined clinically twice weekly for ovarian activity.

RESULTS

Genital examination prior to treatment, revealed that all mares were clinically anestrus, Vaginoscopy showed small closed os uteri. Rectal examination disclosed small, hard inactive ovaries of less than 2.5 cm in longest diameter, accordingly along with their breeding histories, they were diagnosed as clinically deep anestrus.

Results of the genital examination of these mares through out the treatment period, showed that GnRH injection in combination with progesterone failed to induce neither follicular stimulation nor ovulation. Vaginal examination showed small, firmly closed os uteri. Rectal palpation revealed that the ovaries remained small, hard and inactive, consquently, the mares remained in a non-cuclic conditions (deeply anestrus).

DISCUSSION

No control mares were used in this study, since the experiment was performed during the Spring and Summer months (equine breeding season) when the rate of Spontaneous ovarian activity, ovulation and cyclicity is high (10) . Alternatively , the factors which normally initiate the breeding season at the time of experiment were also commenced.

The failure to induce ovarian follicular activity and estrus behavior in all treated mares may indicate that, either the regimen of repeated injection of synthetic GnRH and progesterone did not induce physiologically effective gonadotrophin levels, or probably , prolonged application of GnRH may be required to cause an adequate release of gonadotrophins in mares.

Evans and Irvine (9) have succeded in inducing follicular development , estrus, and ovulation in deep anestrus mares using sequential periods of treatment with GnRH and progesterone. However, these authors administered the hormones to deep Winter anoestrus mares (during the non-breeding season), and the mares were physiologically in a noncycling condition during this time of the year (10). Also, synthetic product of GnRH (Receptal , Hoechst) used by Evans and Irvine (9) appears to be effective in causing ovarian stimulation in mares than the synthetic GnRH (Fertagyl, Intervet) used by us in this present study.
This difference in the activity of the two products may be related to their structural variations.

Also, the failure of response obtained in this present work may indicate that the mares used were in deep anestrus conditions in which their pituitary glands were unresponsive to the treatment Probably due to the some pathological lesions or tumors , or that, their ovaries became no more responsive to gonadotrophins.

The results obtained in this study was comparable to the earlier findings of Allen and Alexeev (8), in which , they also failed to induce follicular growth or estrus behavior in pony mares using repeated injedtions of GnRH (Receptal , Hoechst) alone during the breeding season.

Thus, it appears that, the anestrus mares used in this study were either , suffered from an abnormal endocrine function in their pituitary glands, or, the product of the GnRH (Fertagyl, Intervet) used was not effective for these mares, and would not be recommended to be used for such conditions.

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فشل احداث النشاط الجريبي والعطاف بأستخدام الهورمون المحفز لهورمونات القند (GnRH) المستحضر مع هورمون البروجستيرون في حالات انعدام العطاف العميق في الافراس العربية

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الخلاصة

اجريت محاولة لعلاج ستة افراس عربية في حالة انعدام العطاف العميق بسبب خمول مبايضها باستخدام الهورمون (GnRH) المستحضر لغرض تحفيز هورمونات القند الضروري لاحداث النشاط الجريبي والعطاف اثناء الموسم الانسالي (الربيع والصيف). لقد تم اختيار الافراس بعد دراسة وافية لتواريخ حالاتها التناسلية والفحص السريري للجهاز التناسلي والمتضمن فحص السبيل التناسلي والمبايض من خلال الحبس عن طريق المستقيم وكذلك فحص المهبل وعنق الرحم بواسطة المنظار المهبلي.

بعد تشخيص حالات انعدام العطاف العميق لهذه الافراس وخمول مبايضها تم حقن كل فرس بثلاث وجبات من الهورمون (GnRH) في الايام ١-١١-٢١ من فترة العلاج.

وتتضمن كل وجبة اربعة حقنات بالعضل من الهورمون المذكور وبجرعة ١ ملغم كل ١٢ ساعة تقريبا في الايام ١-٢-١١-٢١-٢٢ من فترة العلاج (اليوم الاول هو يوم بدء العلاج).

كما تم حقن ١ر٥ ملغم من الهورمون في اليوم ٢٣ من العلاج. وكذلك تم حقن كل فرس ب (١٥٠) ملغم من البروجستيرون بالعضل يوميا ابتداء من اليوم الخامس وانتهاءا باليوم السادس عشر من العلاج.

الفحص السريري التناسلي للافراس قد استمر خلال فترة العلاج، جميع الافراس المعالجة لم تظهر اي نشاط جريبي او اي عطاف اثناء وبعد فترة العلاج.

ان هذه الدراسة تشير الى ان استخدام الهورمون (GnRH) المستحضر (فيرتاجيل) مع البروجستيرون في حالات انعدام العطاف العميق في الافراس العربية عديمة الجدوى من ناحية تحفيز النشاط الجريبي وحدوث العطاف.