



## Comparative Study Between Several Protocols for the Treatment of Dystocia Due to Incomplete Dilatation of Cervical in Feline

Elias Khudhur Hussein

Department of Surgery and Theriogenology, College of Veterinary Medicine, University of Mosul, Ninawa, Iraq,

### Abstract

**D**YSTOCIA in a feline (queen) refers to the inability of the fetus to explode or for the kitten to be delivered through the birth canal during the six to twelve hour labor period. Partial or complete non-dilatation of the cervix is more cause of dystocia. The study was conducted at the Veterinary Teaching Hospital affiliated with the College of Veterinary Medicine, University of Mosul, and the veterinary centers for small animals in the city of Mosul. Thirty cats suffering from dystocia due to non-dilatation of the cervix were selected. The study animals were divided into three groups randomly, with each group including 10 animals. The first group was given the hormone oxytocin at a dose of 5 IU with dexamethasone 2 mg, while the second group was given the hormone prostaglandin F<sub>2α</sub> at a dose of 25 mcg with dexamethasone 2 mg and the third group was given the hormone estradiol cypionate at a dose of 1 mg with dexamethasone 2 mg for each animal. The study parameters are: response rate, response onset time, time of birth, whether there were problems that appeared in the mother after birth, and uterine involution. The study's findings revealed that response rate to treatment in G1, G2 and G3 were 80%, 70% and 60%, respectively, with a significant difference ( $P < 1.000$ ). We conclude that oxytocin with dexamethasone is best protocol for treatment of dystocia (cervix indilatation).

**Keywords:** Dystocia, Queen, Hormone, Birth.

### Introduction

The feline's gestation lasts approximately 65 days and ends in three stages of labor [1]. Normal stage 1 labor includes stronger uterine contractions and cervical dilation. The queen may become vocal, restless, or tachypneic clinically. The second stage of birth is characterized by active contractions of the abdomen and uterus, which culminates in fetal delivery. The third stage follows, in which the placenta connected to the fetus is eliminated [2]. Total time spent laboring is usually brief in queens, and all newborns are frequently born within six hours of the first kitten being born. Although the amount of time between deliveries varies, 95% of kittens are born within 100 minutes of one another [3]. Dystocia in a feline (queen) refers to the inability of the fetus to explode or for the kitten to be delivered through the birth canal during the six-to-twelve-hour labor period [4]. The causes of dystocia are divided into three categories: fetal, maternal, and occasionally a combination of both (5). Partial or complete non-dilatation of the cervix is another cause of dam (6). According to reports, cats can have an incidence of dystocia of anywhere from 3–20%, with some breed groups experiencing even higher rates than others [7–9].

The management of dystocia involves two main approaches: medical and surgical. The nature of each approach varies depending on the underlying cause, physical examination, and evaluation [10]. Therefore, this study was designed, which aims to find out the best and most appropriate medical treatment for dystocia in cats, in addition to reducing the time required for birth and preserving the viability of the fetuses.

### Material and Methods

#### Duration of study

The study was conducted at the Veterinary Teaching Hospital affiliated with the College of Veterinary Medicine, University of Mosul, and the veterinary centers for small animals in the city of Mosul, which included the period from 1/9/2023 to 30/12/2023.

#### Study animals

Thirty cats suffering from dystocia due to non-dilatation of the cervix were selected. The condition was diagnosed based on the case history and clinical signs, in addition to a clinical examination of the animal. The study animals were divided into

\*Corresponding: Elias K. Hussein, E-mail: [eliaskhudhr@uomosul.edu.iq](mailto:eliaskhudhr@uomosul.edu.iq), Tel.: +964 774 091 7361

(Received 30/12/2023, accepted 07/02/2024)

DOI: 10.21608/EJVS.2024.259439.1757

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three groups randomly, with each group including 10 animals.

**Treatment**

The first group was given the hormone oxytocin at a dose of 5 international units with dexamethasone 2 mg for each animal, while the second group was given the hormone prostaglandin F2α at a dose of 25 micrograms with dexamethasone 2 mg for each animal and the third group was given the hormone estradiol cypionate at a dose of 1 mg with dexamethasone 2 mg for each animal [6,11].

**Study parameters**

After giving the medication, the animal was monitored for 24 hours, and the following information was recorded: the condition's response to treatment (cervical dilatation), Response onset time, time of birth (the total time of birth relative to the number of fetuses), whether there were problems that appeared in the mother after birth, and the period of disappearance of vaginal fluids after birth.

**Analysis of Data**

The study's results were expressed as Mean + SE using a Chi-square, fisher test, and normal distributions data were compared using ANOVA 1. (One-Way Analysis of Variance). Duncan's Multiple Range Test was used to find significant variances. Sigma Plot 12.5 was used for statistical analysis, and (P<1.000) was considered

statistically significant (Sigma stat, Jandel Scientific Software V3.1).

**The Results**

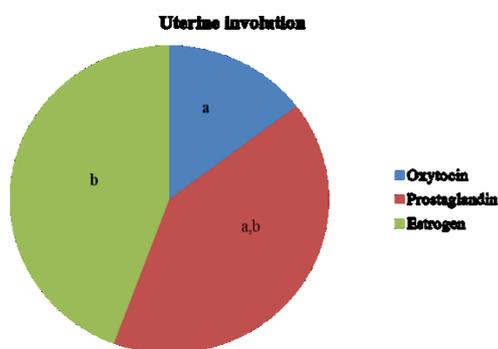
The study's findings revealed that combining the hormone oxytocin with dexamethasone resulted in the highest response rate (80%) in treating dystocia (cervical indilation) in cats with response onset time at a rate of 1.75hours. It also demonstrated that oxytocin combined with dexamethasone could reduce birth time at a rate of 1.25h., as well as accelerate uterine involution after birth at a rate of 33h. and no problems that appeared in the mother after birth when compared to the other groups with a significant difference (P= <1.000).

The results also showed that using the hormone prostaglandin with dexamethasone to treat dystocia in cats gave a good response rate (70%), and response onset time at a rate of 4.28, second only to the oxytocin group, in shortening the time of birth at a rate of 2h., as well as accelerating uterine involution after birth at a rate of 78.85h. and no problems appeared in the mother after birth with a no significant difference (P= <1.000) compared to the third groups. While the estrogen group with dexamethasone had the lowest response rate (60%) in treating dystocia and response onset time at a rate of 6.33h., shortening the time of delivery at a rate of 2.83h., in addition to accelerating uterine involution after birth at a rate of 100h. with two problems that appeared in the mother after birth compared to the rest of the groups, as shown in Table 1 and figures (1,2).

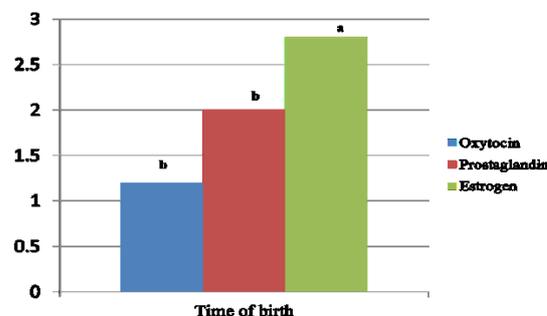
**TABLE 1. Shows the mean values of response rate, response onset time and problems appeared in the mother during or and after birth.**

| The groups                   | Response rate       | Response onset time mean± SE | Problems         |
|------------------------------|---------------------|------------------------------|------------------|
| Oxytocin +dexamethasone      | 80% <sup>a</sup>    | 1.75± 0.31 <sup>a</sup>      | 0% <sup>a</sup>  |
| Prostaglandin+ dexamethasone | 70% <sup>a, b</sup> | 4.28± 1.04 <sup>b</sup>      | 0% <sup>a</sup>  |
| Estrogen + dexamethasone     | 60% <sup>b</sup>    | 6.33± 0.80 <sup>b</sup>      | 20% <sup>b</sup> |

<sup>a,b</sup> Means there is a significant difference (P= <1.000).



**Fig. 1. Shows uterine involution time between groups.**



**Fig. 2. Shows birth time between groups.**

## Discussion

The cats have physiologically prolonged parturition times up to 48 hours (7). Dystocia in a feline (queen) refers to the inability of the fetus to explode or for the kitten to be delivered through the birth canal during the six to twelve hour labor period (4). According to reports, cats can have an incidence of dystocia of anywhere from 3–20%, with some breed groups experiencing even higher rates than others (7–9). Partial or complete non-dilatation of the cervix is more cause of dystocia (6).

The study's findings revealed that combining the hormone oxytocin with dexamethasone resulted in the highest response rate (80%) in treating dystocia in cats with response onset time at a rate of 1.75hours. It also demonstrated that oxytocin combined with dexamethasone could reduce birth time at a rate of 1.25h., this is in agreement with(6). He explained that oxytocin acts directly on the uterus by increasing its contractions and then opening the cervix and expelling the fetus. The results also showed accelerate uterine involution after birth at a rate of 33h. and no problems that appeared in the mother after birth this is in agreement with(12). He indicated that oxytocin act on contract the uterine muscles, which leads to accelerating the contraction of the uterus, in addition to constricting blood vessels and controlling bleeding and uterine discharge. Dexamethasone act to release cortisol, which plays an important role in the birth process by reducing the level of progesterone and increasing estrogen(13).

The results also showed that using the hormone prostaglandin with dexamethasone to treat dystocia in cats gave a good response rate (70%), and response onset time at a rate of 4.28, in shortening the time of birth at a rate of 2h., as well as accelerating uterine involution after birth at a rate of 78.85h. and no problems appeared in the mother after birth this is in agreement with (13,14). They indicated that prostaglandins act to relax the cervix, contract the uterine muscles, reduce the level of progesterone, and increase the level of estrogen and reproductive immune factors.

While the estrogen group with dexamethasone had the lowest response rate (60%) in treating dystocia and response onset time at a rate of 6.33h., shortening the time of delivery at a rate of 2.83h., in addition to accelerating uterine involution after birth at a rate of 100h. with two problems that appeared in the mother after birth(7,11). The reason for the low response rate may be due to the weak effect of estrogen on uterine muscle contraction compared to oxytocin and prostaglandins. While the reason for the appearance of problems in the mother after birth and the delay in uterine involution may be due to the effect of estrogen on

uterine secretions and its lack of effect on the muscles of the uterus.

## Conclusion

We conclude that oxytocin with dexamethasone is best protocol for the treatment of dystocia due to incomplete dilatation of cervical in feline.

## *Acknowledgments*

The author is grateful to Mosul University, College of Veterinary Medicine for providing facilities that helped to improve the quality of this work, and the author is also grateful to manager of the Veterinary Teaching Hospital who assisted us in completing this study.

## *Conflicts of Interest*

There are no conflicts of interest declared by the authors.

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## دراسة مقارنة بين عدة بروتوكولات لعلاج عسر الولادة الناتج عن عدم توسع عنق الرحم في القطط

الباس خضر حسين

قسم الجراحة والتوليد - كلية الطب البيطري - جامعة الموصل - العراق.

عسر الولادة في القطط يشير إلى عدم قدرة الجنين على الخروج والولادة أو عدم ولادة الجنين عبر قناة الولادة خلال فترة المخاض التي تتراوح من ستة إلى اثنتي عشرة ساعة. يعد عدم التوسع الجزئي أو الكامل لعنق الرحم أكثر سبباً لعسر الولادة. أجريت هذه الدراسة في المستشفى البيطري التعليمي التابع لكلية الطب البيطري جامعة الموصل والمراكز البيطرية للحيوانات الصغيرة في مدينة الموصل. تم اختيار ثلاثين قطّة تعاني من عسر الولادة بسبب عدم توسع عنق الرحم. تم تقسيم حيوانات الدراسة إلى ثلاث مجموعات عشوائياً، بحيث ضمت كل مجموعة 10 حيوانات. أعطيت المجموعة الأولى هرمون الاوكسيتوسين بجرعة 5 وحدة دولية مع دكساميثازون 2 ملغ، بينما أعطيت المجموعة الثانية هرمون البروستاكلاندين F2 $\alpha$  بجرعة 25 ميكروغرام مع دكساميثازون 2 ملغ والمجموعة الثالثة أعطيت هرمون استراديول سيببونات بجرعة 1 ملغ مع دكساميثازون 2 ملغ لكل حيوان. معايير الدراسة كانت: معدل الاستجابة، زمن ظهور الاستجابة، وقت الولادة، المشاكل التي تحدث الأم بعد الولادة، وأوب الرحم. أظهرت نتائج الدراسة أن معدل الاستجابة للعلاج في مجموعات G1 و G2 و G3 كان 80% و 70% و 60% على التوالي، مع وجود فرق معنوي (P=1.000). نستنتج أن الاوكسيتوسين مع الدكساميثازون هو أفضل بروتوكول لعلاج عسر الولادة (عدم توسع عنق الرحم).

**الكلمات المفتاحية:** عسر الولادة، القطط، هرمون، ولادة.