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A Comparative Study of the Use of Different Systems to Treat Cases of Delayed Ovulation in Cattle

Hussein Abbas Khamees [1], Ghasaq Sami Mshary [2], Noor Almustafa Emad Kadhum [3]

[1] Assist. Proof. Department of Surgery and Theriogenology, College of Veterinary Medicine, Al-Muthanna University, Al-Muthanna, Al- Samawa, 66001, Iraq

[2] Lecturer. Department of Physiology, Pharmacology and Biochemistry, College of Veterinary Medicine, Al-Muthanna University, Al-Muthanna, Al- Samawa, 66001, Iraq

[3] Lecturer. Department of Clinical Laboratory Sciences, College of Pharmacy, Mustansiriyah University, Baghdad, Iraq

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Annotation: The study was designed to treat recurrent cases of failure of pregnancy in cows, resulting from delayed ovulation, using two treatment methods: hormonal and non-hormonal. The study included 20 cows, all of whom had a history of three or more failed inseminations, despite having a regular reproductive cycle and no apparent signs of uterine or reproductive inflammation. Cows showing signs of estrus were examined by rectal palpation 18 hours after the first sign of estrus. A follicle was observed on one of the ovaries, indicating delayed ovulation. The cows have been divided to two treatment groups: the first one included 10 cows treated with the human chorionic gonadotropin (hCG), while the second group included 10 cows treated with electrical stimulation. The results showed that ovulation occurred in the first group, and insemination and fertilization were successful in 90% of cases, while ovulation and fertilization were successful in the second group, 70% of cases. We conclude from this study that electrical stimulation can be used to stimulate ovulation at a rate almost as high as that of hormonal therapy. This indicates

that ovulation requires hormonal stimulation and a neural reflex to occur. Furthermore, electrical stimulation is a safe, easy-to-use, and inexpensive method that only requires proper control.

Keywords: delayed ovulation, treatment, cattle.

INTRODUCTION

Typically, ovulation occurs about 26hrs to 28hrs after pre-ovulatory LH surge or 15hrs to 18hrs after the end of external estrus signs. An inadequate preovulatory LH peak or its delay, leads to an ovulation delay. The delay in ovulation in cows after the estrus minimizes successful fertilization chances, and it can be identified by the increase in frequency in high-yielding dairy cows (Bloch, *etal*. 2006).

Ovarian cysts result in the prevention of normal ovulation and heat expression. Clinical symptoms that are related to cysts are same as missed heats and anestrus—cows that should be seen in heat aren't. Ovarian cysts are more common than the actual anestrus[2], and treated cows who had ovarian cysts typically have similar fertility to their normal herd mates rather than reduced notably, as is the case with the actual anestrus. The delay in the ovulation is typically diagnosed in the case of excluding other infertility causes (Logue and Mihm, 2008).).

The compromised luteal function that results from the very high metabolism and deficiencies in metabolism: disorders of metabolism like acidosis and subclinical ketosis. The deficiency in Vitamin E and/or A, effects of high ambient temperature (i.e., heat stress). Which are typically considered as repeat breeders' cause: cows that regularly cycle but don't getting pregnant. Poor rates of conception that are combined with prolonged estrus could be an indication of the fact that the delay in ovulation occurs or the failure of follicle to ovulate. Poor fertility has been related to a delay of ovulation due to: Sperm aging, oocyte aging within the follicle, and Changes in oviduct environment (Morgan and Lean, 1993).

GnRH drugs should optimally be used for cattle at AI time or up to 6 hrs beforehand as a result of: The chronological relationship between endogenous release of LH, heat and ovulation duration, and oocyte and sperm survival time. However, in practice, GnRH is typically administered simultaneously with AI and showed quite satisfactory results. A number of the studies[3] showed a significant increase in pregnancy chances in cows that have been reated with: GnRH analogue at 1st post-partum insemination, At 2nd service after calving, and In repeat breeder cows that have been treated with the GnRH at insemination time (Morgan and Lean, 1993).

There has been a better response to treatment from the repeat breeder cows when compared to other groups, which had supported a hypothesis that repeat breeding cows proportion had failed earlier to conceive due to failure in magnitude or timing of GnRH, FSH or LH surge at estrus (Logue and Mihm, 2008).

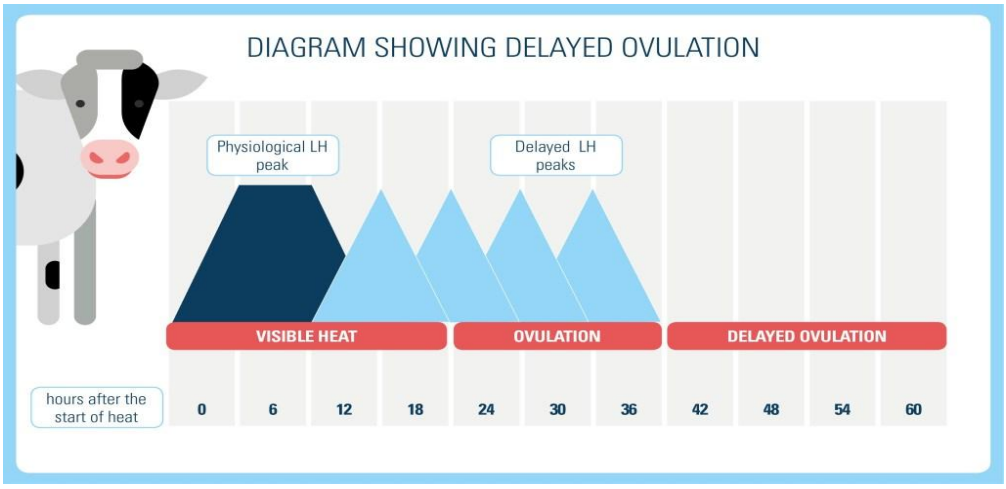

Figure 1. delayed ovulation in cows (Bloch, et.al. 2006)

MATERIALS AND METHODS:

Experimental Samples

The study included 20 cows within the Muthanna Governorate, southern Iraq. All had a history of three or more failed inseminations, despite having a regular reproductive cycle and no apparent signs of uterine or reproductive infections. Cows that showed signs of estrus were examined by rectal palpation 18 hours after the first sign of estrus. A follicle was observed on one of the ovaries, indicating delayed ovulation. Signs of estrus persisted for more than 24 hours (the length of the estrus phase), due to the follicle remaining and secreting estrogen, which produces the apparent signs of estrus. The cows have been divided to two treatment groups:

1. The first one included 10 cows treated with the Human chorionic gonadotropin (hCG).
2. The second group included 10 cows treated with electrical stimulation.

Methods of Treatment:

Group 1: Cows were injected with a single dose of human chorionic gonadotropin (5 ml) (hCG) (1500 IU) by intramuscular rout Figure (2). The cows were then inseminated using artificial insemination.

Figure 2. Human chorionic gonadotropin (MSD animal Health)[R]

Group 2: An electrical potential difference of 12 volts was applied using an electrical stimulation device to the lower part of the external genital opening, specifically the lesser labia junction (lesser commissure) (figure 3). This procedure was performed prior to insemination. The cows were then inseminated using artificial insemination.

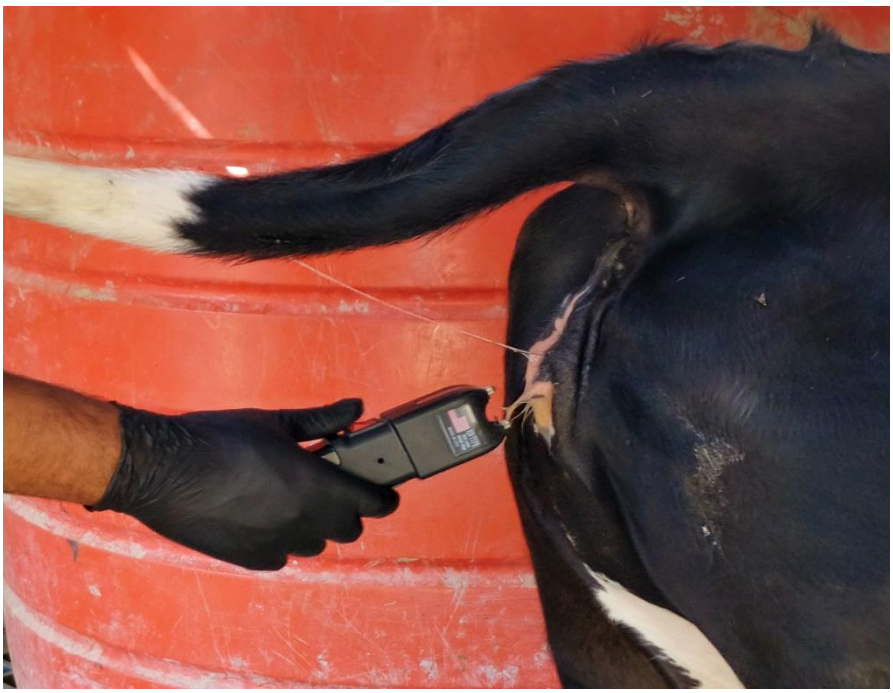

Figure 3. Electrical stimulation device applied on the lower part of the external genital opening (lesser commissure)

RESULTS

The results showed that ovulation occurred in the first group, and fertilization and insemination were successful in 9/10 (90%). Ovulation and insemination were successful in the second group, with a 7/10 (70%) success rate (table 1) (Figure 4). We conclude from this study that electrical stimulation can be used to induce ovulation at a rate almost as high as that of hormonal therapy. This indicates that ovulation requires hormonal stimulation and a neural reflex to initiate it. Furthermore, electrical stimulation is a safe, easy-to-use, and inexpensive method that only requires animal control. Therefore, the study recommends its use in cases of delayed ovulation in cows.

Table 1. Comparison of the use of two different methods for stimulating ovulation in cows suffering from breeder

Study Group	Number of Animals	Treatment Method	Results of Insemination	Advantage	Disadvantage
1st	10	Human chorionic gonadotropin (hCG)	9/10 (90%)	A safer method	Expensive ($30 per injection)
2nd	10	Electrical Stimulation	7/10 (70%)	Inexpensive (free)	Requires careful handling

Figure 4. Calving after non-hormonal treatment (electrical stimulation) of delayed ovulation case of cow

DISCUSSION

According to the results of this study that showed the animals treated with (hCG) responsible to the treatment and the ovulation occurred, lead to the fertilization and insemination were successful agree with (Bors, 2020) that show Cystic ovary disease can be refractory to the initial treatments. Some of the cysts readily respond to the treatments with a luteinizing-type hormone; hCG was commonly utilized. (Tebble, *et al*; 2001).) also show the treatment by using Gn-RH could be effective at a 100mcg dose and is less antigenic when compared to the treatment by using hCG, which might get less effective on subsequent treatments due to immune responses.

Electrical ovulation stimulation is a new and innovative method that has shown good results. It is also easy and inexpensive, requiring only control of the animal. The scientific explanation for this is that applying a simple electrical current stimulates the animal's nervous system to induce ovulation.

CONCLUSIONS:

We conclude from this study that electrical stimulation can be used to stimulate ovulation at a rate almost as high as that of hormonal therapy. This indicates that ovulation requires hormonal stimulation and a neural reflex to occur.

RECOMMENDATIONS:

Furthermore, electrical stimulation is a safe, easy-to-use, and inexpensive method that only requires proper control.

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