



# COMPARATIVE STUDY BETWEEN MELATONIN HORMONE AND VAGINAL SPONGES PLUS ECG ON EFFECT OF FERTILITY IN LACTATING IRAQI NUAIMY EWES

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## Abstract

This study was conducted on 45 lactating Iraqi Nuaimy ewes (50-60days postpartum) in Al-Musaib city / Babylon province during the period from March - December /2019, aged from 3-6 years, divided randomly into three equal groups (15 ewes of each) according to the type of hormonal treatment, 1<sup>st</sup> group were treated with Melatonin hormone implants S/C (18mg/ewe) for 30days (isolated from rams), 2<sup>nd</sup> group were treated with vaginal sponges (20mg Medroxy acetate progesterone) for 12days withdrawal injected 500IU eCG/ IM directly, while the 3<sup>rd</sup> group represented control group (without treatment). The results showed that the responsive animals were recorded 13/15 (86.6%) & 14/15 (93.3%) and 8/15 (53.3%) in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> groups respectively with duration of response recorded significantly differences (P<0.01) related with 2<sup>nd</sup> group compared with 1<sup>st</sup> and 3<sup>rd</sup> group as well as 1<sup>st</sup> group compared with 3<sup>rd</sup> group. The pregnancy rate was showed a significantly (P<0.01) in control group compared with treated groups. Nature of parturition revealed 90% normal and 10% dystocia parturition, while the twinning rate was recorded significantly (P<0.01) in treated groups compared with control group as well as the viability of off spring was 90% of alive compared with 10% of dead. In conclusion, the use of hormonal treatments (Melatonin or vaginal sponges plus eCG) was effective for improvement reproductive performance which include fertility, days open, pregnancy and twinning rate.

**Key words:** Melatonin, Nuaimy ewes, eCG.

## Introduction

Ewes are one of the most domestic animals must consume feed containing essential nutritional to support body function as well as various reproductive activity include pregnancy and lactation (Al-Hamedawi *et al.*, 2003; Iida *et al.*, 2004; Noakes *et al.*, 2008). One of the most important characteristics of ovine reproduction is seasonality (Romano *et al.*, 1996; Abecia *et al.*, 2012), the main reason which explain the seasonal reproduction in ewes include late summer or early autumn represented the season in tropical area but in subtropical the seasonality may be absent (Vinoles *et al.*, 2001; Abdalla *et al.*, 2014; Kumar *et al.*, 2016). Hormonal treatment used out of season include vaginal sponges and eCG in various doses represented the main treatment regime for rebound the activity of reproductive system (Das *et al.*, 2000; Revel *et al.*, 2009; Ozyurtlu *et al.*, 2010). Recently melatonin, a natural hormone related with photoperiod

signals to the reproductive neuro-endocrine axis and is present in all domestic animals, this hormone is synthesis from tryptophan and serotonin in the pineal gland which effected on hypothalamus to secret GnRH (Zaiem *et al.*, 1996; Gomez *et al.*, 2006; Abecia *et al.*, 2011). Many authors recorded the important effect of melatonin implants for improvement of reproductive performance on many reproductive parameters such as reducing days open, lambing rate and twinning rate (Miszat *et al.*, 2002; Forcada *et al.*, 2002; Taplur *et al.*, 2018). So the purpose of this study is to evaluate the use of melatonin implants compared with other hormonal treatments (vaginal sponge plus eCG) in improvement of fertility in lactating Iraqi Nuaimy ewes.

## Materials and Methods

This study was conducted on 45 lactating Iraqi Nuaimy ewes (50-60days postpartum) in Al-Musaib city / Babylon province during the period from March - December /2019, aged from 3-6 years, divided randomly

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**Table 1:** Type of treatment, response animals and duration of response in Iraqi Nuaimy ewes.

| Groups | No. of animals | Type of treatment                           | Response animals |          | Duration of response (days) M±SE |
|--------|----------------|---|------------------|----------|----------------------------------|
|        |                |   | No.              | %        |                                  |
| G1     | 15             | Melatonin implants /S.C 18mg /30 days       | 13               | 86.6     | 11.26±3.12                       |
|        |                |   |                  | <b>b</b> | <b>b</b>                         |
| G2     | 15             | Vaginal sponges 12 days/20mg +PMSG 500IU/IM | 14               | 93.3     | 4.82±1.17                        |
|        |                |   |                  | <b>a</b> | <b>a</b>                         |
| G3     | 15             | Without treatment                           | 8                | 53.3     | 78.36±9.57                       |
|        |                |   |                  | <b>c</b> | <b>c</b>                         |
| Total  | 45             | -   | 33               | 73.3     | -                                |

Different small letters means sig. differences (P<0.01) between groups.

into three equal groups (15 ewes of each) according to the type of hormonal treatment, 1<sup>st</sup> group were treated with Melatonin hormone implants S/C (18mg/ewe) for 30days (isolated from rams), 2<sup>nd</sup> group were treated with vaginal sponges (20mg Medroxy acetate progesterone) for 12days withdrawal injected 500IU eCG/ IM directly, while the 3<sup>rd</sup> group represented control group (without treatment). Animal response, duration of response as well as pregnancy rate, nature and type of parturition and the viability of kids have been studied. Statistical analysis including mean, standard error, Chi-square and F-test were used according to Steel and Torrie, (1988).

### Results and Discussion

The result showed in table 1, the type of treatment, the responsive animals and duration of response, it was 86.6, 93.3 and 53.3% for 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> group respectively with a significant differences (P<0.01) for the 2<sup>nd</sup> group compared with 1<sup>st</sup> and 3<sup>rd</sup> groups and for the 1<sup>st</sup> group compared with 3<sup>rd</sup> group in the response to treatment and that agreed with (Abecia *et al.*, 2011) who recorded response rate of 80-85% by using vaginal sponges and (Gomez *et al.*, 2006) who recorded 75-80% by using melatonin implants. The duration of response in the groups were 11.26±3.12, 4.82±1.17 and 78.36±9.57 respectively this agreed with (Zaiem *et al.*, 1996) who recorded duration of response after sponges withdrawal 4.08±1.02 and 4.13±0.77. While the present study recorded a

significant differences (P<0.01) in the 2<sup>nd</sup> group compared with 1<sup>st</sup> and 3<sup>rd</sup> groups and for the 1<sup>st</sup> group compared with 3<sup>rd</sup> group and these results are agreed with (12, 13) that the progestagen sponges plus eCG and melatonin implants improved the reproductive performance of ewes. In table 2, the pregnancy rate were significantly higher (P<0.01) in 3<sup>rd</sup> group (100%) compared with 1<sup>st</sup> and 2<sup>nd</sup> groups (84.6%, 91.9%) respectively and for the 2<sup>nd</sup> group compared with 1<sup>st</sup> group while the nature of parturition was 100% normal in 3<sup>rd</sup> group with a significant differences (P<0.01) compared with 90.9% normal parturition and 9.1% dystocia in the 1<sup>st</sup> group and 81.8% normal parturition and 19.2% dystocia in the 2<sup>nd</sup> group and there were a significant differences between 1<sup>st</sup> and 2<sup>nd</sup> group in (P<0.01) for the 1<sup>st</sup> group, but a significant differences (P<0.01) was recorded for the normal parturition 90% compared with dystocia 10%. The twinning rate was 33.3% in all groups compared with 66.7% single and this agreed with (Zaiem *et al.*, 1996) who recorded 83.3% for vaginal sponges and with (Gomez *et al.*, 2006) who recorded 78% for progestagen and eCG; 78% for melatonin versus 65% for the control. A significant differences (P<0.01) for the single parturition, the twinning rate was (36.7%, 45.5% and 12.5%) for the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> group respectively. Alive fetuses recorded 90% in all groups (86.6%, 87.5% and 100%) respectively this results agreed with (16, 17) (that melatonin play a role on embryo viability in sheep), which

**Table 2:** Pregnancy rate, Nature and type of parturition and viability of off spring in Iraqi Nuaimy ewes.

| Groups | Response animals | Pregnancy rate |          | Nature of parturition |               | Type of parturition |               | Viability of kids |             |
|--------|------------------|----------------|----------|-----------------------|---------------|---------------------|---------------|-------------------|-------------|
|        |                  | No.            | %        | N/%                   | D/%           | S.                  | T.            | A./%              | D. /%       |
| G1     | 13               | 11             | 84.6     | 10                    | 1             | 7                   | 4             | 13                | 2           |
|        |                  |                | <b>c</b> | 90.9                  | 9.1 <b>b</b>  | 63.3                | 36.7 <b>a</b> | 86.6              | 13.4        |
| G2     | 12               | 11             | 91.9     | 9                     | 2             | 6                   | 5             | 14                | 2           |
|        |                  |                | <b>b</b> | 81.8                  | 19.2 <b>c</b> | 54.5                | 45.5 <b>b</b> | 87.5              | 12.5        |
| G3     | 8                | 8              | 100      | 8                     | 0             | 7                   | 1             | 9                 | 0           |
|        |                  |                | <b>a</b> | 100                   | 0 <b>a</b>    | 87.5                | 12.5 <b>c</b> | 100               | 0           |
| Total  | 33               | 30/33          | 90.9     | 27/30 <b>a</b>        | 3/30          | 20/30               | 10/30         | 36/40             | 4/40        |
|        |                  |                | <b>b</b> | 90 <b>a</b>           | 10 <b>b</b>   | 66.7 <b>a</b>       | 33.3 <b>b</b> | 90 <b>a</b>       | 10 <b>b</b> |

Different small letters means sig. differences (P<0.01) between groups; N: normal, D: dystocia, S: single, T: twins, A: Alive, D: dead.

was significantly higher ( $P < 0.01$ ) than dead fetuses 10% (2%, 2%, 0%) for the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> group respectively, which in agreement with (Forcada *et al.*, 2002; Kumar *et al.*, 2016) that vaginal sponges and melatonin implants improved the reproductive performance on many reproductive parameters such as reducing days open, lambing rate and twinning rate.

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