SOME ENDOCRINE RESPONSE TO HORMONAL TREATMENT IN CASES OF ANESTRUM IN BUFFALO-COWS AND REPRODUCTIVE PERFORMANCE RELATIONSHIP.

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SOME ENDOCRINE RESPONSE TO HORMONAL TREATMENT IN CASES OF ANESTRUS IN BUFFALO-COWS AND REPRODUCTIVE PERFORMANCE RELATIONSHIP.
(With Two Tables)

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RESPONSE TO HORMONAL TREATMENT, ANESTRUM IN BUFFALO-COW

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A study was made on 100 cows (80 treated + 20 control) to investigate the effect of various hormonal treatments on the reproductive performance of cows. The treatments were given to the cows at different stages of the estrus cycle. The results showed that the hormonal treatments had a positive effect on the reproductive performance of the cows. The study was conducted at the Department of Theriogenology, Fac. of Vet. Med. Kafir El-Sheikh, Tanta Univ.

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SUMMARY

A total number of 100 healthy buffalo-cows suffering from anestrus were divided into two main groups based on the ovarian findings with or without palpable corpus luteum. Each main group was further subdivided into 5 subgroups. The 1st subgroup received Estramate 500 µg (repeated once after 11 days in cases that did not respond to the first injection); the 2nd subgroup received Fertagyl (0.25 mg); the 3rd subgroup received Estramate plus Fertagyl (repeated once after 11 days in cases that did not respond to the first injection); the 4th subgroup received Estramate plus Folone 5 (5 mg) and the 5th subgroup act as a control and received no treatment. Blood samples were collected from all treated subgroups before and after treatment (during estrus) for estimation of serum tri-iodothyronin (T₃) and thyroxine (T₄) using radioimmunoassay. The obtained results revealed that serum T₃ level showed a significant increase (P < 0.05) after Estramate and Estramate plus Folone treatment in anestrus buffalo-cows with and without palpable corpus luteum. Serum T₄ level showed a significant increase (P < 0.05) after Estramate treatment of anestrus buffaloes with and without palpable corpus luteum. Whereas, the serum T₄ level showed a highly significant increase (P < 0.01) in anestrus buffalo-cows with palpable corpus luteum after treatment with Estramate plus Folone as well as after Estramate plus Fertagyl treatment (P < 0.05). For treated anestrus buffaloes with palpable corpus luteum, treatment with Estramate plus Folone was the best as the response (appearance of estrus signs) was 100% with 80% pregnancy rate, followed by Estramate alone, Estramate plus Fertagyl and finally Fertagyl alone. For treated anestrus buffalo-cows without palpable corpus luteum, treatment with Estramate alone was the best as the response was 90% with 70% pregnancy rate followed by Estramate plus Folone and finally Fertagyl alone and Estramate plus Fertagyl are about equal in their effects.

Keywords: Endocrine response, hormonal treatment, anestrus, buffalo-cows, reproductive performance, relationship.

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INTRODUCTION
Reproduction in farm animals is closely related to the dynamic activity of the thyroid gland (SOLIMAN et al., 1964 and AFIEFY et al., 1970).
Thyrotrophic hormone (TSH) influences reproduction via the production of thyroxin and triiodothyronin which regulate the metabolic pools of nitrogen producing available energy necessary for the reproductive system and the developing embryo. Therefore, abnormal decrease in thyroid hormones may interfere with normal pregnancy (HAFEZ, 1980).
It was found that thyroid hormones increases the basal metabolic rate by increasing both oxygen consumption as well as the concentration of Na+, K+ and ATP in brown adipose tissue (KNCHANS and ROMSON, 1989). In this respect, KLEIN et al. (1984) reported that T3 enhance the norpinephrine induced stimulation of oxygen consumption by adipose tissue. Therefore, the thyroid hormones could affect neonatal thermogenesis through the lipolytic activity of catecholamines.
Regarding the estrus cycle in buffalo-heifers, KUMAR et al. (1991) observed a maximum concentration of T3 level on -3, -2, -1 and 0 days of estrus, while T4 peak level was at the onset of estrus.
On the other hand an idea about the plasma level of thyroid hormones in infertile buffaloes is required to know the different mechanisms enhancing the reproductive processes in these infertile buffaloes. The present investigation was carried out to know the level of thyroid hormones in the infertile buffalo-cows before and after different hormonal treatments in addition to evaluate the effect of these hormonal treatments on their reproductive performance.

MATERIAL and METHODS
This work was carried out on 100 healthy buffalo-cows (4-9 Years) suffering from anestrus in Khattara farm, Sharkia province (80 treated + 20 control).
- These animals did not show any signs of heat since 3-6 months. Gynaecological examination proved the absence of any detectable pathological affections or abnormalities in their reproductive organs.
- According to the ovarian findings, the animals were classified into two main groups including cows with and without palpable corpus luteum (Table 1 and 2). Each main group was further subdivided into 5 subgroups (each subgroup included 10 cows) according to the trial of treatment.
a- The first subgroup received 2 ml Estrumate* (500 μg PGF₂ α), cases that did not respond received the same dose 10-12 days after the first injection.

b- The second subgroup received 2.5 ml Fertagyl alone** (0.1 mg/ml Gn-RH).

c- The third subgroup received 2 ml Estrumate plus 2.5 ml Fertagyl after 5 days (repeated once after 11 days in cases that did not respond to the first injection).

d- The fourth subgroup received 2 ml Estrumate plus 25 mg stilboestrol*** (Folone 5).

e- The fifth subgroup acted as a control and received no treatment.

• Blood samples were collected from the jugular vein of each buffalo-cow immediately before treatment and during estrus in the responded animals. The blood was allowed to clot and centrifuged at 3000 r.p.m for 20 minutes for separation of serum. The separated serum stored at 20°C till processed further.

RESULTS

The results of the present study listed in table (1) and table (2). The obtained results revealed a marked fluctuation in the level of serum T₃ and T₄ in buffalo-cows with or without palpable corpus luteum before and after treatments. For anestrous buffaloes with palpable corpus luteum, treatment with Estrumate plus Folone was the best (100 %) response and pregnancy rate respectively followed by Estrumate alone, Estrumate plus Fertagyl and finally Fertagyl alone. For onestrous buffaloes without palpable corpus luteum, treatment with Estrumate alone was the best (90 %) response and pregnancy rate respectively followed by Estrumate plus Folone and finally Fertagyl alone and Estrumate plus Fertagyl are about equal in their effects.

DISCUSSION

The present results (Table 1) showed that there was a significant increase (p < 0.05) in the T₃ level after Estrumate and Estrumate plus Folone therapy in buffalo-cows with and without palpable CL. On the other hand, a non significant increase in serum T₃ level was observed in buffalo-cows with and without palpable CL after Fertagyl and Estrumate plus Fertagyl.

Similar findings were recorded by IBRAHIM et al. (1990) who showed that, the serum T₃ content was increased significantly after injection of anestrous buffalo-cows with 25 mg
prostaglandin F$_2$α, MELANDER et al. (1974) also reported an increased TSH in laboratory animals treated with PGF$_2$α. Moreover, VADO- DARIA et al. (1978) showed a lower thyroid activity immediately after ovulation with the peak activity at the beginning of heat. The high level of T$_3$ during proestrus may be due to stress caused by hyperactivity as confirmed by KHURANA and MADAN (1985). Furthermore, the higher level of T$_3$ after hormonal treatment may be attributed to the stimulatory effect of PGF$_2$α on the secretion of gonadotrophins, steroid production by the adrenals and insulin release (JOHNSON et al., 1973) and thyrotropin-like effect on the thyroid gland (MASHITER and FIELD, 1974). The obtained data (Table 1) showed a significant increase (p<0.05) in the T$_4$ level after Estrumate treatment in buffaloes with and without palpable CL, whereas, in buffaloes with palpable corpora lutea, the T$_4$ level showed a highly significant increase (p<0.01) after treatment with Estrumate plus Folone and a significant increase (p<0.05) after Estrumate plus Fertagyl treatment. On the other hand, the present results showed a non significant increase in the T$_4$ level in buffaloes with and without palpable CL after Fertagyl treatment and in buffaloes without CL. after Estrumate plus Folone and Estrumate plus Fertagyl treatments.

Our results were in agreement with those obtained by D'ANGELO and FISHER (1969) who observed a peak level of serum T$_4$ at the onset of estrus. These results were much related to the increased estrogen level at the onset of estrus, as estrogen stimulated the thyroid gland activity by direct action without the intervention of pituitary gland (KUMAR et al., 1991). Estrogen might also stimulate TSH release from the pituitary gland (D'ANGELO and FISHER, 1969) causing elevation of the T$_4$ during estrus as observed during the present study. Moreover, IBRAHIM et al. (1990) observed that, the administration of PGF$_2$α increased T$_4$ activity in aneustus buffaloes. In pregnant woman, SHENKMAN et al. (1974) recorded that, the administration of PGF$_2$α increased the concentration of T$_3$ and T$_4$ levels. The obtained results of the different trials for treatment of the buffaloes suffering from anestrus were listed in table (2). Our results indicated that, in buffalo-cows with palpable CL treated with Estrumate plus Folone exhibited the highest percentage of response (100%) with 80% conception rate, followed by Estrumate (90 V 80%), Estrumate plus Fertagyl (70 V 70%) and Fertagyl (50 V 40%), respectively.
These results are in agreement with those obtained by INSKEEP et al. (1975) who observed that 95% of cows came in heat after PGF₂α plus Folone treatment.

The high response to Estramate plus Folone in the present study, may be attributed to luteolytic action of exogenous estrogen (MCDONALD, 1980 and WILLIAMS, 1980). Estrogen may also exert its luteolytic effect by stimulating endogenous PGF₂α secretion (BARTOL et al., 1980 and KNICKERBOCKER et al., 1986). This hypothesis was supported by that obtained by GENGENBACH et al. (1977) who demonstrated a luteolytic interaction between estradiol and PGF₂α in ewes independent of the uterus.

Meanwhile in the buffalo-cows without palpable CL, the treatment with Estramate revealed the highest percentage (90%) of response and 70% conception rate followed by Estramate plus Folone (80 V 60%), Fertagyl (60 V 50%) and Estramate plus Fertagyl (60 V 50%), respectively. The high response to Estramate in the present study may be attributed to the embedding lutein tissues of the CL in the ovarian matrix that could be misdiagnosed by rectal palpation specially in the buffalo-cows that have large sized ovaries. This suggestion was supported by the findings of EL-WISHTY et al. (1971) who stated that the clinical evidence for the presence of CL can not be always obtained by rectal palpation, because CL in the major cases of buffaloes are either embedded in the ovarian matrix or very slightly protruded above the ovarian surface so that they could be misdiagnosed even on careful rectal examination. Moreover, this statement was strongly supported by EIssa et al. (1990) who stated that absence of a palpable CL in the ovaries of buffaloes should not be taken as an individual parameter indicating that the animal is not cycling at the time it is examined.

It can be concluded from this study that Estramate plus Folone was the best treatment used in anestrous buffalo-cows with palpable CL, while Estramate alone was the best drug used in anestrous buffalo-cows without palpable CL, as reflected by appearance of estrus and their conception rate as well as serum T₃ and T₄ levels.

REFERENCES


RESPONSE TO HORMONAL TREATMENT, ANEISTRUM IN BUFFALO-COW


Table 1: Mean (±S.E) serum values of Triiodothyronin (T3) and tetraiodothyronin (T4) of infertile buffalo-cows with and without palpable CL before and after hormonal treatment.

<table>
<thead>
<tr>
<th>Hormones used</th>
<th>Parameters</th>
<th>Buffalo-cows with CL</th>
<th>Buffalo-cows without CL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T3 (µg/dl)</td>
<td>T4 (µg/dl)</td>
<td>T3 (µg/dl)</td>
</tr>
<tr>
<td>Estrumate</td>
<td>Before</td>
<td>After</td>
<td>Before</td>
</tr>
<tr>
<td>± 5.97</td>
<td>± 7.985</td>
<td>± 3.85</td>
<td>± 8.54</td>
</tr>
<tr>
<td>Fertagyl (Gn - RH)</td>
<td>Before</td>
<td>After</td>
<td>Before</td>
</tr>
<tr>
<td>± 5.79</td>
<td>± 8.834</td>
<td>± 2.85</td>
<td>± 7.31</td>
</tr>
<tr>
<td>Estrumate + Fertagyl</td>
<td>Before</td>
<td>After</td>
<td>Before</td>
</tr>
<tr>
<td>± 7.999</td>
<td>± 10.56</td>
<td>± 2.07</td>
<td>± 6.59</td>
</tr>
<tr>
<td>Estrumate + Folone</td>
<td>Before</td>
<td>After</td>
<td>Before</td>
</tr>
<tr>
<td>± 6.53</td>
<td>± 6.205</td>
<td>± 3.46</td>
<td>± 8.79</td>
</tr>
</tbody>
</table>

*: (P < 0.05)
**: (P < 0.01)
±: Standard error.

Table (2) Some reproductive parameters of treated anestrous buffalo-cows with and without palpable CL.

<table>
<thead>
<tr>
<th>Treated groups</th>
<th><strong>Buffalo-Cows with CL</strong></th>
<th></th>
<th><strong>Buffalo-Cows without CL</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treat. Cases</td>
<td>Resp. Cases</td>
<td>%</td>
<td>Interval Days</td>
</tr>
<tr>
<td>Estrumate (PGF2α)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st trial</td>
<td>10</td>
<td>6</td>
<td>60</td>
<td>4 ± 1</td>
</tr>
<tr>
<td>2nd trial</td>
<td>4</td>
<td>3</td>
<td>75</td>
<td>13.5 ± 1.52</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>9</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Fertagyl (500 i.u.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st trial</td>
<td>10</td>
<td>5</td>
<td>50</td>
<td>12.25 ± 3.29</td>
</tr>
<tr>
<td>2nd trial</td>
<td>10</td>
<td>3</td>
<td>30</td>
<td>4.67 ± 0.64</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>7</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Estrumate + folliculin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st trial</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td>6.5 ± 1.8</td>
</tr>
<tr>
<td>Control</td>
<td>10</td>
<td>1</td>
<td>10</td>
<td>70</td>
</tr>
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