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STUDY ON THE THYROID FUNCTION OF MALE AND FEMALE THOROUGHBRED HORSES IN DIFFERENT TIMES AFTER WINNING RACES AT THE HIPPODROME CIDADE JARDIM, WITH THE USE OF "IN VITRO" 125I-T₃ AND 125I-T₄ TESTS

Benedicto Wlademir DE MARTIN*


SUMMARY: The author has studied nine animals, five females and four males, observing also data on age, weight, pulse, breathing and temperature taken before and after the race, besides the values of T₃ and T₄ Tests of the sera collected 30, 60, 90 and 120 minutes after the event. We have performed variance and regression analysis for the results of T₃ and T₄ Tests obtained from this group. For T₃ Test significance was found as to sex, along with linear regression, with the same results for T₄ Test without linear regression. We have added the data relative to T₃ Test of this group with those obtained from sera of male and female horses, in repose and after activity, to the values obtained from females over 90 days pregnant verifying statistical significance through variance analysis. With the help of Tukey's test, we have noticed, in this case, differences among the three groups. The data referring to T₄ Test of sera of male and female horses after winning a race, in repose, after activity, with data obtained from females over 90 days pregnant showed statistical significance by variance analysis. Using Tukey's test in the four groups, we found that only the horses in repose group differed from the others.

UNITERMS: Thyroid, functions*; Equines*; "In vitro" tests.

INTRODUCTION

The observation that the thoroughbred equines presented different values for T₄ Test for groups of both sexes, in repose and after activity and again for females between 43 and 55 days pregnant, when compared with the values found in those in more advances stages of pregnancy, led the author to perform a study on the functional behavior of the thyroid glands of these animals, both males and females, through the use of "in vitro" T₃ and T₄ Tests, dosed in sera removed from bleeding at 30, 60, 90 and 120 minutes after winning the race.

LITERATURE

T₃ and T₄ Tests applied to sera in horses proved to be of interest to the study of the thyroid function of these animals.

The study of the thyroid function of these animals by the use of radioisotopic techniques, especially with the help of T₃ and T₄ Tests, showed that the value varies in accordance with the activity, but remains constant as regards to sex, age and weight.

Thus, for values of T₃ Test we have found as normal results between 43 and

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59%\textsuperscript{6, 8, 10}, although, to establish a comparison with those here shown, we have considered the average of 50.30% (P.S.I.) for horses after activity and in repose and of 44.30% for pregnant females\textsuperscript{4}.

For \( T_4 \) Test the values found are between 0.76 and 2.60 mg\textsuperscript{6, 8}, but we prefer to work with average values for thoroughbred selected as normal in repose, females over 60 days pregnant and after activity of 0.61 mg, 2.29 mg and 2.01 mg \( T_4/100 \text{ ml} \), respectively.

**MATERIAL AND METHODS**

We have examined the serum of nine animals, winners of races at the S\ão Paulo Jockey Club, being four males and five females, aged between three and five years and four years, respectively, removing in each bleeding an average of 30 ml of blood from the jugular vein. After clot retraction, centrifugation was done and then the serum was placed in test tubes and kept in freezer at -10\degree C.

To measure the activity of the 125I bound to the thyroid hormones we have used the model 8725 gamma spectrometric system of the Nuclear Chicago, coupled to a two inches diameter well detector with NaI crystal (Tl) and a 16mm inner diameter, gauged for the 125I energy, with a 15Kev window.

*Method to establish the percentage of the 125I-lyothyronine retention in resin (Test 125I-\( T_3 \) or \( T_3 \) Test)*\textsuperscript{5}modified.

The author has used SCHOLER’s method (1962), introducing modifications and in this work have varied the amount of serum of 0.05 to 0.2 ml directly deposited on the resin column after addition of the 125I-lyothyronine in order to measure the places not bound to the triiodothyronine.

**Method to determine the total thyroxin (Test 125I-\( T_4 \) or \( T_4 \) Test)**\textsuperscript{**}

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For this, we have employed the method proposed by MURPHY & PATTEE (1964).

We have established the averages and standard deviations as well as Pearson’s variability coefficient of the values included in the tables showing the results.

Later on, we have equalled the values by allotment and before the treatment these were converted into angles (angle = arc sen. \( \sqrt{\text{percentage}} \)).

To verify the statistical significance with a 95% confidence coefficient we have performed the variance and regression analysis.

The author has made Tukey’s test in order to elucidate differences between the groups that showed significance in the variance analysis.

**RESULTS**

In Tables I and II, of female and male winners, respectively, we have registered clinical data on age, weight, pulse, breathing and temperature, taken before and after the race, besides the values of \( T_3 \) and \( T_4 \) Tests of sera collected 30, 60, 90 and 120 minutes after the event. For the females, as average results of \( T_3 \) and \( T_4 \) Tests of sera collected 30, 60, 90 and 120 minutes, respectively, we obtained the values of 55.58% and 2.47 mg; 64.43% and 2.48 mg; 65.52% and 2.34 mg; and 62.23% of 125I-lyothyronine retention in resin and 2.52 mg of \( T_4/100 \text{ ml} \) of serum. For the males, as average results of \( T_3 \) and \( T_4 \), at 30, 60, 90 and 120 minutes, respectively, we found the values of 47.47% and 2.67 mg; 60.31% and 2.93 mg; 60.00% and 2.49 mg; and 58.59% of 125I-lyothyronine retention in resin and 2.66 mg of thyroxine per 100 ml of serum.

The author has performed the variance and regression analysis for the \( T_3 \) and \( T_4 \) Tests, respectively, applied to the date found. For \( T_3 \) Test, there was significance as to sex as well as linear regression, with the same result for \( T_4 \) Test without linear regression. By Tukey’s test, the authors observed that this was due to the first animal.

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200  
TABLE 1 — Averages, standard deviations and Pearson’s variability coefficient of thoroughbred females, according to age (years), weight, pulse, breathing and temperature, and results obtained with the help of $T_3$ Test (retention percentage) and $T_4$ (mg $T_4/100ml$), according to time elapsed after winning a race. Hippodrome Cidade Jardim. São Paulo, 1973.

<table>
<thead>
<tr>
<th>NAME'S INITIAL</th>
<th>AGE</th>
<th>WEIGHT (kg)</th>
<th>PULSE (MINUTES)</th>
<th>BREATHING (MINUTES)</th>
<th>TEMPERATURE ($°C$)</th>
<th>RACING (METERS)</th>
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$\bar{x}$ (Mean) 3.4 | 415.2 | 44.4 | 116.0 | 14.8 | 55.2 | 38.1 | 39.5 | 1249 | 55.58 | 2.47 | 64.43 | 2.40 | 65.52 | 2.34 | 62.23 | 2.52 |

$\sigma$ (Standard deviation) 0.55 | 12.37 | 9.09 | 3.03 | 3.03 | 10.70 | 0.99 | 0.29 | 167.33 | 7.62 | 0.29 | 6.71 | 0.31 | 4.83 | 0.06 | 6.28 | 0.40 |

Pearson’s variability coefficient 16.2 | 3.0 | 26.5 | 2.6 | 20.5 | 19.4 | 0.3 | 0.7 | 13.5 | 14.1 | 11.9 | 13.5 | 12.4 | 7.4 | 2.7 | 10.0 | 15.9 |

TABLE 2 — Averages, standard deviations and Pearson’s variability coefficient of thoroughbred males, according to age (years), weight, pulse, breathing and temperature, and results obtained with the help of $T_3$ Test (retention percentage) and $T_4$ (mg $T_4/100ml$), according to time elapsed after winning a race. Hippodrome Cidade Jardim. São Paulo, 1973.

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$\bar{x}$ (Mean) 4 | 463.7 | 43.0 | 114.0 | 14.0 | 59.6 | 30.1 | 39.7 | 1452 | 47,47 | 2.07 | 60,31 | 2.95 | 60,00 | 2.49 | 60,69 | 2.66 |

$\sigma$ (Standard deviation) 0.82 | 13.75 | 4.16 | 4.89 | 1.63 | 5.74 | 0.10 | 0.21 | 193.87 | 3.12 | 0.63 | 10.06 | 0.82 | 7.78 | 0.13 | 5.32 | 0.09 |

Pearson’s variability coefficient 20.4 | 3.0 | 10.2 | 4.3 | 11.7 | 9.8 | 0.3 | 0.5 | 13.3 | 6.6 | 22.1 | 16.7 | 28.0 | 13.0 | 5.0 | 9.1 | 3.5 |
DISCUSSION

We have added the data referring to T₃ Test obtained from female and male equines’ sera after winning a race, in repose and after activity, to the values obtained from females over 90 days pregnant, and observed statistical significance by variance analysis. Performing Tukey’s test, we have found, in this case, that the three groups varied among themselves.

The data referring to T₄ Test of male and female equines’ sera after winning a race, in repose and after activity, with date obtained from female over 90 days pregnant showed statistical significance by variance analysis.

Using Tukey’s test in the four groups, we found that only the females in repose group differed from the others.


RESUMO: Foram estudados 9 animais, sendo 5 fêmeas e 4 machos, onde se observou, também, dados sobre idade, peso, pulso, respiração e temperatura, tomadas antes e depois da corrida, além dos valores dos Testes T₃ e T₄ dos soros colhidos, 30, 60, 90 e 120 minutos após a prova. Foram feitas análises de variância e de regressão para os resultados dos Testes T₃ e T₄ obtidos neste lote. Para o Teste T₃ houve significância quanto ao sexo observando-se, também, regressão linear, obtendo-se o mesmo para o Teste T₄, sem regressão linear. Confrontamos os dados referentes ao Teste T₃ deste lote com os conseguidos de soros de equinos, machos e fêmeas, em descanso e em trabalho, com os valores obtidos em fêmeas em gestação acima de 90 dias, verificando-se significância estatística mediante a análise da variância. Aplicando-se o Teste de Tukey, observamos, neste caso, que os 3 lotes diferiam entre si. Os dados referentes ao Teste T₄, de soros de equinos, machos e fêmeas, após terem vencido corrida, em descanso, em trabalho, com dados obtidos de fêmeas em gestação acima de 90 dias, verificando-se a custa da análise da variância, significância estatística. Aplicando-se o teste de Tukey aos 4 lotes, observou-se que apenas o lote dos equinos em descanso diferiu dos demais.

UNITERMS: Tireíde, função*; Equinos*; Testes "in vitro".

BIBLIOGRAPHY


