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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" ^{125}I-T_3 AND ^{125}I-T_4 TESTS

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DE MARTIN, B.W. *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" ^{125}I-T_4 and ^{125}I-T_3 tests.* **Rev. Fac. Med. vet. Zootec. Univ. S. Paulo, 14(2): 199-203, 1977.**

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 T_3 and T_4 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 T_3 and T_4 Tests obtained from this group. For T_3 Test significance was found as to sex, along with linear regression, with the same results for T_4 Test without linear regression. We have added the data relative to T_3 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 T_4 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 T_4 Test for groups of both sexes, in repose and after activity and again for females between 45 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" T_3 and T_4 Tests, dosed in sera removed from bleeding at 30, 60, 90 and 120 minutes after winning the race.

LITERATURE

T_3 and T_4 Tests [14,12,13,1,2] applied to sera in horses[9,5,6,8,10,3,4] 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[15,9,7,5,6,8,10,3,4], especially with the help of T_3 and T_4 Tests, showed that the value varies in accordance with the activity, but remains constant as regards to sex, age and weight[7,10,3,4].

Thus, for values of T_3 Test we have found as normal results between 43 and

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59%[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[4].

For T_4 Test the values found are between 0.76 and 2.60 mcg[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 mcg, 2,29 mcg and 2.01 mcg T_4/100 ml[4], respectively.

MATERIAL AND METHODS

We have examined the serum of nine animals, winners of races at the São 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°C.

To measure the activity of the ^{125}I 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 ^{125}I energy, with a 15 Kev window.

Method to establish the percentage of the ^{125}I-lyothyronine retention in resin (Test ^{125}I-T_3 or T_3 Test)*, *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 columm after addition of the ^{125}I-lyothyronine in order to measure the places not bound to the triiodothyronine.

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

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 make 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 2.47mcg; 64.43% and 2.48 mcg; 65.52% and 2.34 mcg; and 62.23% of ^{125}I-lyothyronine retention in resin and 2.52 mcg of T_4/100 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 mcg; 60.31% and 2.93 mcg; 60.00% and 2.49 mcg; and 58.59% of ^{125}I-lyothyroninne retention in resin and 2.66 mcg of thyroxine per 100 ml of sarum. 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.

* Triluta, Ames Company. Israel
** Tetralute, Ames Company. Israel

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

NAME'S INITIAL	AGE	WEIGHT (kg)	PULSE (MINUTES)		BREATHING (MINUTES)		TEMPERATURE (°C)		RACING (METERS)	TIME (MINUTES) AFTER THE RACE							
										30		60		90		120	
			BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER		T_3	T_4	T_3	T_4	T_3	T_4	T_3	T_4
B.	3	410	54	114	18	42	38,1	39,6	1400	64,98	2,41	62,84	2,26	71,14	2,35	65,36	2,12
B.	3	400	36	116	12	54	38,2	39,7	1000	51,77	2,06	61,93	2,18	70,06	2,26	64,13	2,11
H.	3	428	42	114	14	72	38,0	39,6	1400	63,08	2,38	61,84	2,41	63,76	2,31	64,62	2,66
Y.	4	410	36	120	12	54	38,0	39,0	1200	48,93	2,73	56,24	2,95	62,52	2,35	65,91	2,67
Q.	4	428	54	120	18	54	–	39,6	1200	49,16	2,78	79,30	2,58	60,14	2,43	51,11	3,04
$\bar{x}$ (Mean)	3,4	415,2	44,4	116,8	14,8	55,2	38,1	39,5	1240	55,58	2,47	64,43	2,48	65,52	2,34	62,23	2,52
$\bar{s}$ (Standard deviation)	0,55	12,37	9,09	3,03	3,03	10,70	0,09	0,28	167,33	7,82	0,29	8,71	0,31	4,83	0,06	6,25	0,40
Pearson's variability coefficient	16,2	3,0	20,5	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 (mcg T_4/100ml), eccording to time elapsed after winning a race. hippodrome Cidade Jardim. São Paulo, 1973.

NAME'S INITIAL	AGE	WEIGHT (kg)	PULSE (MINUTES)		BREATHING (MINUTES)		TEMPERATURE (°C)		RACING (METERS)	TIME (MINUTES) AFTER THE RACE							
										30		60		90		120	
			BEFORE	AFTER	BEFORE	AFTER	BEFORE	AFTER		T_3	T_4	T_3	T_4	T_3	T_4	T_3	T_4
S.	4	470	40	114	14	54	38,2	39,5	1609	47,10	3,79	50,22	4,13	48,41	2,60	50,72	2,75
Z.	3	450	46	120	16	66	–	39,8	1600	48,91	2,32	68,69	2,35	63,28	2,48	60,14	2,56
L.	5	380	36	114	12	60	38,1	40,0	1200	43,29	2,70	53,11	2,46	65,14	2,57	61,28	2,60
P.	4	455	42	108	14	54	38,0	39,7	1400	50,57	2,69	69,23	2,77	63,19	2,32	62,24	2,72
$\bar{x}$ (Mean)	4	463,7	41,0	114,0	14	58,5	38,1	39,7	1452	47,47	2,87	60,31	2,93	60,00	2,49	58,59	2,66
$\bar{s}$ (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 T_3 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 pregnent, 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 T_4 Test of male and female equines' sera after winning a race, in repose and after activity, with date obtained from female over 90 days pregnent showed statistical significante by variance analysis.

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

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DE MARTIN, B. W. *Estudo da função tiróides em equinos machos e fêmeas Puro Sangue Inglês, em diferentes tempos, após terem vencido carreira no Hipódromo de Cidade Jardim, mediante a utilização dos testes "in vitro" ^{125}I-T_3 e ^{125}I-T_4.* Rev. Fac. Med. vet. Zootec. Univ. S. Paulo, 14 *(2): 199-203, 1977.*

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 T_3 e T_4 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 T_3 e T_4 obtidos neste lote. Para o Teste T_3 houve significância quanto ao sexo observando-se, também, regressão linear, obtendo-se o mesmo para o Teste T_4, sem regressão linear. Confrontamos os dados referentes ao Teste T_3 deste lote com os conseguidos de soros de eqüinos, 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, evidenciamos, neste caso, que os 3 lotes diferiam entre si. Os dados referentes ao Teste T_4, de soros de eqüinos, machos e fêmeas, após terem vencido corrida, em descanso, em trabalho, com dados obtidos de fêmeas em gestação acima de 90 dias, verificando-se à custa da análise da variância, significância estatística. Aplicando-se o teste de Tukey aos 4 lotes, observou-se que apenas o lote dos eqüinos em descanso diferiu dos demais.*

UNITERMOS: *Tiróide, função*; Eqüinos*; Testes "in vitro".*

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