Iranian J. Publ. Health , 1996 , Vol. 25 , Nos. 1-2

STUDIES OF TESTOSTERONE LEVEL IN SIX POPULATIONS OF IRAN

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Key words: *testosterone , saliva sterioid assay , radioimmuno assay , Iran*

Abstract

Testosterone level was determined in six different populations of Iran using saliva steroid assay. Significant difference was observed in morning and afternoon testosterone level of the same individual (P>0.001) significant difference was also noticed among different regions studied (P>0.001).

Comparions between alcoholics and nonalcoholics as well as smokers and nonsmokers showed significant difference in most of the cases.

Introduction

several different determinants of human salivary extract pattern are known including biological , behavioral , depressional , sociodemographical and environmental factors , operating separately as well as in conjunction with each other.

Earlier studies (2,3) have shown that saliva testosterone levels decrease with increasing supplement of the traditional diet and the amount of alcohol consumption. Significant higher level of saliva testosterone has been reported in upper ranges of sea level (1).

Saliva sampling is an advantageous way of collecting samples since it is a non-invasive , stress - free technique and moreover multiple sampling is easy. The point which adds to the importance of saliva sampling is the fact that saliva level reflects free plasma testosterone which is biologically active hormone "testosterone" (5,6).

Six different populations of Iran was studied with regard to their testosterone levels using saliva steroid assay technique.

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Materials and methods

The study was performed over one year period. Populations and the number of cases studied are listed in table 1. The principal selection for the subjects under study was their willingness to participate.

Two samples were collected for each subject of a working day , once in the morning and once in the afternoon , Final analysis was carried out on 170 individuals ranging from 21-53 years old.

Saliva samples were collected in small wide-neck tubes (2 ml) , in each occassion and stored at 4^0 - 10^0 C. Specimens were transported quickly to the laboratories and immediately , deep frozen at -25^0 C.

Testosterone concentration of saliva samples were determined by radioimmuno assay (3). Using solvent extraction , liquid phase antiserum and H3 radioligand. Charcoal was used to separate the antibody - bound and free functions. 200 µl aliquots of saliva was used.

Paired sample t-test was performed between morning and afternoon testosterone levels in each location (6). Two tailed t-test (7) , was performed to compare testosterone level in different locations and between alcoholics and non alcoholics as well as smokers and non smokers , using SPSS statistical program.

Results and discussion

Populations , number of cases and their statistics are presented in table 1. Tehran population showed the highest testosterone level among populations (506.2 , 406.4) both in morning as well as afternoon. The lowest morning and afternoon level occurd in Lorestan (303.8 , 185.3) population.

The highest amount of standard deviation was obseved in Harmak population for both morning and afternoon (59.1 , 60.6) level indicating more variation among the samples.

Table 2 pressents paired sample t-test for testosterone levels between morning and afternoon. All populations studied showed significant difference ($P>0.001$) indicating higher level of hormonal activity in the morning.

Comparisons made among populations studied are presented in table 3 and 4. Almost in all cases , significant difference was observed in both

morning and afternoon level , indicating specifity of hormonal activity in each population. Each population possessed specific distribution in morning as well as afternoon level. The reason for these differences are not clear , however difference in nutrition may be considered as a possible factor (3). Other factors incuding heavy work loads , disease burdens , or specific nutrition defficiencies has been considered to be important too (3).

Ecological and environmental conditions prevailing for each population may play a role in differences observed among populations studied.

Table 5 and 6 present testosterone comparisons among alcoholics and non alcoholics as well as smokers and nonsmokers. Althrough absolute conclusions can not be drawn from the test , in most of the cases a significant difference was observed inficating higher level of hormonal activity in non-smokers and non-alcoholics. Several reports indicated suppression of testicular hormone release due to consumption of large amount of alcohol , resulting in pathologically low testosterone levels (8).

Though present investigation clearly shows true differences among population of Iran , the reason for such variations are not known. Further studies could throw light on this matter which is important in human ecology.

Acknowledgements

We would like to thank Dr. Zakizadeh for his generous assistance in Tehran.

Table 1 - Locations , number of cases and statistics of testosterone level

No.	Location	Time	No. of Cases	Minimum	Maximum	Mean	Standard Deviation
1	Clardasht	(a.m) (p.m)	17 17	397.0 387.5	500.5 387.5	452.7 340.6	34.6 36.5
2	Harmak	(a.m) (p.m)	26 26	359.0 217.5	574.0 436.0	472.4 348.3	59.1 60.6
3	Torkaman	(a.m) (p.m.)	29 29	270.5 156.0	314.0 227.0	297.7 194.3	10.1 15.83
4	Tehran	(a.m) (p.m.)	43 43	418.0 329.5	561.0 473.5	506.2 406.4	33.1 31.9
5	Lorestan	(a.,.) (p.m.)	31 31	256.0 164.5	398.0 237.0	303.8 185.3	22.1 13.9
6	Nahanbandan	(A.M.) (A.M.)	23 23	247.5 143.5	409.0 303.0	343.9 233.4	55.7 54.1

Table 2- Test for the paired samples in each location between a.m. and p.m. testosterone level.

No.	Location	T	P
1	Clardasht	24.08	>0.001
2	Harmak	26.79	>0.001
3	Torkaman	39.80	>0.001
4	Tehran	12.62	>0.001
5	Lorestan	33.22	>0.001
6	Nahanbandan	20.66	>0.001

Table 3- T-test for morning testosterone level among locations studied.

	C	H	TO	TE	L	N
C	-	1.3**	18.0**	5.4*	16.0**	3.7**
H		-	14.6**	2.6**	13.7**	46.7**
TO			-	38.7*	1.3ns	3.9**
TE				-	31.5**	12.8**
L					-	3.2*
N						-

* = >0.05 ** = 0.01 ns = Nonsignificant

(C = Clardasht , H = Harmak , TO = Torkaman , TE = Tehran , L = Lorestan , N = Nahanbandan)

Tabie 4 - T-test for afternoon testosterone level among locations studied.

	C	H	TO	TE	L	N
C	-	0.5ns	15.7**	6.5*	16.9**	7.4**
H		-	12.5**	4.5**	16.2**	7.0**
TO			-	54.5**	2.3**	14.0**
TE				-	40.3**	14.0**
L					-	4.1*
N						-

* = >0.05 ** = 0.01 ns = Nonsignificant

(C = Clardasht , H = Harmak , TO = Torkaman , TE = Tehran , L = Lorestan , N = Nahanbandan)

Table 5 - T-test for alcoholic / non alcholic

No.	Location	Time	2t	P
1	Clardasht	a.m p.m	0.37 -2.67	0.071 0.18
2	Harmak	a.m p.m	-3.74 3.13	0.001 0.002
3	Torkaman	a.m p.m	-1.43 -1.36	0.165 0.184
4	Tehran	a.m p.m	-3.60 -1.93	0.001 0.060
5	Lorestan	a.m p.m	-0.93 -0.37	0.36 0.71
6	Nahanbandan	a.m p.m	-3.05 -2.51	0.006 0.02

Table 6 - T-test for smokers / non smokers

No.	Location	Time	2t	P
1	Clardasht	a.m p.m	0.39 1.03	0.7 0.31
2	Harmak	a.m p.m	-2.22 -2.55	0.036 0.018
3	Torkaman	a.m p.m	0.22 -0.26	0.83 0.79
4	Tehran	a.m p.m	-2.76 -1.94	0.009 0.60
5	Lorestan	a.m p.m	-1.43 -2.44	0.16 0.021
6	Nahanbandan	a.m p.m	-2.69 -2.42	0.014 0.025

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