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The Clinical relevance of serum testosterone and sexual activity in the ageing male

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I. Introduction

Androgens play an important role in the development of male secondary sexual characteristics and androgen deficiency may result in structural abnormalities of the penis.[1-3] .[6] Nevertheless, the correlation between testosterone levels and libido is poor,[7-9] and the testosterone levels required to sustain normal sexual interest are apparently low.[7] However, Anderson et al [10] reported that increasing testosterone to supra physiological concentrations can increase sexual activity, although the effect may be marginal. Most clinical studies of testosterone and sexual functions are related to libido, ejaculations and nocturnal erections rather than reflex erection. In animal models erection is androgen- dependent; in castrated rats the intra cavernosal pressure was reduced in response to electrical field stimulation of the cavernosal nerve. Testosterone treatment of castrated rats restored this response.[11] Partial androgen deficiency of the aging male (PADAM) is defined as a biochemist cal syndrome associated with advancing age that is characterized by a deficiency in serum androgen levels. The Aging Male's Symptoms (AMS) Scale was developed to evaluate PADAM-related symptoms and is currently used worldwide; however, it has been reported that PADAM-related symptoms evaluated by this scale are not related to serum testosterone levels. In addition to testosterone, the levels of other hormones also decrease with age; therefore, multi hormone alterations may influence PADAM-related symptoms.[43]

II. Aim of study

The aim of our research was to study sexual activity in old age and its relation to serum testosterone.

III. Materials and Methods

The material of this work included seventy (70) married male subjects all above fifty (50) years old. The study started from January 2013 to may 2015 in Crimean Medical Academy named after S.I. Georgievsky Crimean Federal University named after V.I. Vernadsk Russia in department of dermatology and reproductive and beauty. They were divided into two groups:

Group I: The Study Group

Fifty males, all were looking apparently healthy, mentally and physicaly; and were receiving no medications served as the study group. They were complaining of sexual troubles as desire disorders and/or potency disorders.

Group Ii : The Control Group Twenty apparently normal males with normal sexual life served as the control of this study. All cases in this study were subjected to Ditald History taking Personal.

i. Sexual history Information sought during taking of the sexual history was as follows: Onset of sexual dysfunction (gradual or acute) . Nature of the sexual dysfunction (desire disorders or erectile troubles) - Duration of the sexual dysfunction The nature of erectile troubles "failure to obtain or to maintain erection" Current level of sexual functioning Libido (desire/drive—satisfaction/pleasure-fantasies thoughts) Sexual partner (S) Orgasms Ejaculation (ante grade, retrograde, absent, premature) The presence or absence of a good quality morning erection or a spontaneous nocturnal erection

Collection of specimens:

An early morning blood sample was taken from each elder. Serum was separated by centrifugation and was collected by a micropipette to be placed in test tubes and stored in a deep freezer at -20^{O}C.

Ethical consideration

Written consents were obtained from all patients before the study. The steps of were explained to all patients. The local ethics committee had approved all procedures. Ethical approval for this study Dermatology Department and reproductive and beauty Crimean Medical Academy named after S.I. Georgievsky Crimean Federal University named after V.I. Vernadsk Russia

Statistical analysis

The statistical tests were run on a compatible personal computer using the Statistical Package for Social Scientists (SPSS) for windows 15. Chi-square distribution was used for studying the frequencies of recurrence, pain, hospital stay and postoperative complications. The values were expressed as means ± standard errors of deviation. The mean values of the groups were compared by one-way analysis of variance (ANOVA) and paired comparisons of the groups were done using the paired student t test. $P < 0.05$ was considered significant.

IV. Results

Distribution of cases and control of age groups: (Table 2) Cases in the age group 50 - <60 years were 25 cases, while those in the age group 60- <70 years were 17 cases and those in the age group 70 years and over were 8 cases. Control subjects in the age group 50- <60 year were 11, while those in the age group 60- <70 years were 6 and those 70 years and over 3. Distribution of cases according to the duration of their sexual trouble: (Table 3) Cases who were complaining a duration of less than a year were 14, those who were complaining a duration from 1- <2 years were 8, those who were complaining a duration from 2- <3 years were 14 and those who were complaining a duration from 3-10 years were 14 cases. No single case was complaining of desire disorder alone. Distribution of cases according to the type of sexual trouble: (Table 4) Those who were complaining of erectile troubles only were 12 cases while those who were com plaining of both erectile troubles with desire disorders were 38 cases. Results of Routine Investigations

All cases included in this study had a normal fasting blood sugar level, a normal

complete blood picture (tables 5, 6) and no abnormalities in urine or stool analysis. Results of Hormonal Assay : Both serum testosterone and serum LH have been assayed for all cases and con- trol. The values obtained are going to be correlated to Age, Type of sexual trou- ble and duration of sexual trouble. i Correlation between age and serum testosterone: - In cases of age between 50 and 60 years

2.7 years, Their number was 25 cases. The mean age was 54.16 serum testosterone ranged from 220.0—672.6 ng/dl with a mean of 114.16 ng/dl. 337.61 In the 11 control of the same group, their mean age was 54.18 2.93 years with a serum testosterone ranged from 248.4749.8 ng/dl and 141.87 ng/dl. a mean of 354.01 Tables (7a / 7b) show no significant correlation between age and serum testosterone in cases and control of age group 50 to 60 years. - In cases of age between 60 and 70 years 3.03 years. Their number was 17 cases. The mean age was 64.24 Serum testosterone of this group of cases ranged from 212.7-822.5 141.56 ng/dl. ng/dl with a mean of 357.49 In the 6 control subjects of the same age group, the mean age was 2.86 years. Serum testosterone ranged from 163.5-535.1 63.83 ng/dl with a mean of 291.02 127.47 ng/dl. Table (8a / 8B) show no significant correlation between age and serum testosterone in cases and control of age group 60 to 70 years.

iii In cases of age 70 years and over 2.59 years. Serum Their number was 8 cases. The mean age was 74.88 testosterone of this group ranged from 131.4-520.1 ng/dl 137.49 ng/dl. with a mean of 333.74 In the 3 control subjects of the same age group, the mean age was 1.53 years. Serum testosterone ranged from 274.6-288.8 71.33 7.15 ng/dl. ng/dl with a mean of 282.2 Table (9a) shows a positive significant correlation between age and serum testosterone in cases of age 70 years and over while table (9b) shows that there is no significant correlation between age and serum testosterone in the control of the same age group. iv In cases as a whole group, the age ranged from 50-78 years with a 8.15 years. Serum testosterone ranged from 131.4- mean of 60.90 125.42 ng/dl. 822.5 ng/dl with a mean of 343.75 Table (10a) shows no significant correlation between age and serum testosterone in cases as a group. In control subjects as a whole group, age ranged from 51-73 years 7.16 years. Serum testosterone ranged from with a mean of 59.65 126.55 ng/dl. 163.5-746.8 ng/dl with a mean of 324.34 Table (10b) shows a comparison between serum testosterone in the different age groups of cases. The F-value shows no significant correlation between the different means of testosterone in the different age groups. v Table (11) shows a comparison between serum testosterone in the different age groups of cases. The F-value shows no significant correlation between the different means of testosterone in the different age groups.

V. Discussion

Maintaining sexual capacity in the elderly needs good physical and mental health and regular sexual expression. The relation between sexual and more general developmental changes at all ages must be understood as a process. General, as well as specifically sexual, changes of aging arec expectable.[38]

The aim of this work was to study sexual activity in the elderly in relation to testosterone. Cases for this study had to fulfill the criteria of good physical and mental health and at the same time had sexual complaints related to their desire or erectile powers.

In choosing cases with these criteria, detailed sexual and psychological histories helped to identify and exclusion of cases of psychological problems. A detailed present and past medical histories excluded cases who were not fit. Also a good clinical examination for all body systems helped to exclude cases with organ diseases especially cardiac, respiratory, hepatic, nervous and renal diseases.

Because of the importance of vascular factor in normal penile erection, dorsal penile arteries blood pressure was assessed using Doppler ultrasound to exclude cases of abnormal penile vascular supply. We have relied upon readings recorded from ausculating the dorsal penile artery because of the difficulty in ausculating the deep cavernosal arteries. This was the case for many investigators who relied upon this method for measuring the penile systolic blood pressure using the same instrument.[25][38-58]

Fasting blood sugar level, complete blood picture, urine and stool analyses were performed as routine investigations and helped in exclusion of diabetes mellitus, blood diseases, renal troubles .

Elderly male subjects were selected, fifty of them had sexual troubles but physically and mentally healthy served as cases for this study, while other twenty subjects who served as the control, were of normal sexual life and also physically and mentally healthy. The cases and control subjects of this study were then subjected to hormonal assay inclusive of testosterone.

One blood sample was taken from each case and control subject at eight o'clock in the morning to exclude the factor of diurnal variation of the hormonal serum level.

As regards serum testosterone level in this study, it did not significantly differ in cases and control (Tables 10a, b, 11, 17, 18). Many studies. [26-48] reported no change in serum testosterone level with age. This goes in accord with our study. On the other hand, some investigators had reported that serum testosterone declines with age (.28-38) The difference between these studies and between their's and our's may lie in the difference of samples of cases collected and in the interplay of many factors which are now known to affect the serum level of testosterone, such as obesity [57] , alcoholism [50], chronic illness and stress [44].

Other studies [40] reported that the dihydrotestosteroneis that which shows the decline with age more than the total serum testosterone which we have measured to our cases. Some [55][56] had reported that only the free plasma testosterone fraction is that which shows the decline with age.

The concomitant reduction in the metabolic clearance rate of testosterone with advancing age [26][38-48]probably explains why serum testosterone concentration is still normal in the majority of elderly subjects.

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Table I: Age and Penile Brachial index (PBI) as measured by the Doppler ultrasound for

NO.	AGE IN YEARS	PBI	NO.	AGE IN YEARS	PBI
1	54	0.9166	26	69	0.875
2	65	1	27	77	0.8235
3	57	0.9230	28	68	0.8823
4	60	0.8235	29	50	1
5	63	1	30	57	0.9285
6	65	0.8641	31	78	0.9411
7	60	0.8461	32	60	0.8666
8	63	0.8571	33	55	1
9	53	0.8333	34	73	0.875
10	54	1	35	62	0.9285
11	56	0.8	36	72	0.8181
12	58	0.9166	37	63	0.9166
13	55	0.9230	38	50	1
14	55	0.8571	39	64	0.8461
15	54	0.9160	40	62	0.9285
16	65	0.9160	41	72	0.9285
17	77	1	42	50	1
18	50	0.9166	43	55	1
19	56	1	44	77	0.8235
20	57	1	45	68	0.8823
21	58	1	46	50	1
22	51	1	47	73	0.875
23	66	0.9285	48	57	0.9166
24	53	1	49	53	1
25	56	0.8571	50	69	0.875

Table 2: Distribution of **cases and control according to age groups**

Age In Years	Cases		Control	
	NO.	%	NO.	%
50-	25	50	11	55
60-	17	34	6	30
70 and over	8	16	3	15
TOTAL	**50**	**100%**	**20**	**100%**
-				
x		60.90		59.65
s		8.15		7.16
T				**0.5991 (NS)**

Table 3 : Distribution of cases according to the duration of sexual troubles.

Duration Of Sexual Troubles In Years	No. Of Cases	
< 1	14	28%
1—	8	16%
2—	14	28%
3—10	14	28%
	50	100%

Table 4 : Distribution of cases according to the type of sexual trouble.

Type Of Sexual Trouble	No. Of Cases	
Erectile troubles only	12	24%
Erectile and desire disorders	38	76%
	50	100%

Table 5: Age and Fasting blood sugar of "cases"

NO.	AGE IN YEARS	FASTING BLOOD SUGAR mg%	NO.	AGE IN YEARS	FASTING BLOOD SUGAR mg%
1	54	97	26	69	90
2	65	95	27	77	80
3	57	90	28	68	78
4	60	84	29	50	80
5	63	85	30	57	105
6	65	86	31	78	80
7	60	88	32	60	84
8	63	92	33	55	85
9	53	92	34	73	90
10	54	86	35	62	85
11	56	98	36	72	80
12	58	85	37	63	84
13	55	115	38	50	105
14	55	90	39	64	87
15	54	79	40	62	98
16	65	115	41	72	86
17	77	90	42	50	80
18	50	110	43	55	95
19	56	105	44	77	87
20	57	80	45	68	100
21	58	85	46	50	88
22	51	87	47	73	105
23	66	79	48	57	103
24	53	82	49	53	90
25	56	90	50	69	98

Table 7a: Correlation between age and serum testosterone in cases aged between 50 and 60 years.

	AGE IN YEARS	TESTOSTERONE ng/dl
Range -	50- <60	220.0-672.6
x	54.16	337.61
s	2.70	114.16
r		0.10
t (n-2)		0.4820 (NS)

Table 7b: Correlation between age and serum testosterone in control subjects aged between 50 and 60 years.

	AGE IN YEARS	TESTOSTERONE ng/dl
Range -	50-<60	248.4—749.8
x	54.18	354.01
s	2.93	141.87
r	-0.14	
t (n-2)	0.4242 (NS)	

Table 8a: Correlation between serum testosterone and age in cases of age between 60 and 70 years.

	AGE IN YEARS	TESTOSTERONE ng/dl
Range -	60—<70	212.70—822.50
x	64.24	357.49
s	3.03	141.56
r	- 0.37	
t (n-2)	1.5425 (NS)	

Table 8b: Correlation between serum testosterone and age in the control of age ranged between 60 and 70 years.

	AGE IN YEARS	TESTOSTERONE ng/dl
Range -	60- <70	163.5—535.1
x	63.83	291.02
s	2.86	127.47
r	- 0.55	
t (n-2)	1.3171 (NS)	

Table 9a: Correlation between serum testosterone and age in cases of age between 70 years and over.

	AGE IN YEARS	TESTOSTERONE ng/dl
Range -	70—78	131.4—520.1
x	74.88	333.74
s	2.59	137.49
r	+0.78	
t (n-2)	3.0532 (S)	

Table 9b: Correlation between serum testosterone and age in control of 70 years and over.

	AGE IN YEARS	TESTOSTERONE ng/dl
Range -	70—73	274.6—288.8
x	71.33	282.20
s	1.53	7.15
r	- 0.21	
t (n-2)	0.2148 (NS)	

Table 10a: Correlation between serum testosterone and age in all cases.

	AGE IN YEARS	TESTOSTERONE ng/dl
Range -	50—78	131.4—822.5
x	60.90	343.75
s	8.15	125.42
r	- 0.02	
t (n-2)	0.7668 (NS)	

Table 10b: Correlation between serum testosterone and age in all control.

	AGE IN YEARS	TESTOSTERONE ng/dl
Range -	51—73	163.5—749.8
x	59.65	324.34
s	7.16	126.55
r	- 0.33	
t (n-2)	1.4832 (NS)	

Table 11a: Comparison between serum testosterone levels in cases of different age groups.

Age groups (years) Variable	50— <60	60- <70	70—78
Range -	220.0—672.6	212.7-822.5	131.4—520.1
x	337.61	357.49	333.74
s	114.16	141.56	137.49
F– value	0.1520	(NS)	

x - mean
s - standard deviation
NS - non significant