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Correlation between HbA1C serum Level and Sexual Dysfunction in Women with Diabetes Mellitus

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Abstract

Introduction: To study association between the serum level HbA1C and severity of sexual dysfunction and compare sexual function in Diabetic and nondiabetic women. **Methods:** A total of 240 diabetic women aged 20-60 years old take part in this study which we selected 120 patients with exclusion criteria such as lack of psychosomatic disorder and compared with 120 healthy nondiabetic women. These two groups were matched by age and other parameters. The demographic and medical history data were extracted by 2 questionnaires. Physical exam was done for all subjects and finally female sexual function index (FSFI) questionnaire was filled for them. Check of HbA1C was made with Ion exchange, column chromatography. **Results:** Eighty eight persent of diabetic women and 72% of nondiabetic women had one or more problem in domains. There isn't remarkable correlation between HbA1C <12% and FSF score, but in HbA1C >12%, FSF score decrease clearly (P<0.004)Severity of FSD in under weight or normal BMI diabetic women is less than overweight or obese diabetic women (P<0/036). There is a significant negative relation between educational and emotional level with FSD (P<0/001). Type of DM and FSD hasn't any relation **Conclusion:** The prevalence of FSD in Iranian women is more than world researches. That is an important neglected problem with in women and physicians. **[GMJ. 2012;1(1):13-19]**

Keywords: HbA1C - Diabetes Mellitus – Female - Sexual Dysfunction

Introduction

Female sexual function is a main title that was influenced by several parameters such as, organic, psychological, socioeconomic and cultural factors.

The normal female sexual functions (FSF) contain; desire, arousal, and orgasm. Hormonal elements, neurotransmitters and nitric oxide take part in this cycle and cause vascular relaxation, increasing of blood flow, lubrication and engorgement of genitalia (1).

According review of researches, overall prevalence of female sexual dysfunction (FSD) during 1 month ago is near 45% (2).

Difficulty in desire spread in wide range between 7-30%, arousal problem during 1 year was reported 23%, vaginal dryness 20% and orgasm disorder 25% (2).

Diagnostic cornerstone of FSD is, taken a careful history and physical examination. History including; medication, organic and psychiatric disease, mense condition, trauma, sexual disorder in partner, emotional relationship, and etc (2) .

Physical exam consist of systemic and atten-

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tive genitalia exam association with a female nurse. Lab data and another modality when is needed.
Improvement of FSD causes betterment of self confidence, interpersonal linkage and quality of life.
Diabetes mellitus (DM) is prevalent disease in world that associated with organ function failure in long-term, such as renal failure, heart failure, and sexual dysfunction. Etiology of FSD is multifactorial, peripheral and central nerve system damage, endothelial dysfunction, endocrinopathies and etc (3).
It was show that sexual dysfunction in diabetic men was higher than normal population (28% in diabetic men versus 9% in normal men). IN addition, when duration of DM increased, prevalence of sexual dysfunction progressed (3).
Female sexual dysfunction is a relatively widespread and complex disorder that in Iranian women due to special sociocultural reasons, this study was planned for, investigation of correlation between HbA1C and severity of FSD in diabetic women.

Methods and Materials

0A total of about 2650 diabetic women that for routine check up had attended to diabetes clinic of Shiraz University of Medical Sciences, Iran, and 240 married women aged 20-60 years old, participated in this cross sectional study that 120 women selected on basis of exclusion criteria and compared with 120 non diabetic married healthy women from normal population. Control group matched by age, medical status, educational level and without significant psychiatric and organic disorders, known to effect sexual function, such as chronic renal failure, depression and etc.
Exclusion criteria; No medication, lack of serious complications of DM, no another psychosomatic disorders, normal sexual function in husband, and without smoking and alcoholism.
Data were extracted from three detailed questionnaires.
Personal characteristic consist of; age, occupation, educational level, social, cultural and economic status, married duration, emotional and marital relationships.
Medical history including; type of DM, contraceptive method, smoking, alcohol, drug abuse and physical exam.
Female sexual function index (FSFI) questionnaire that translated to Iranian. This validated questionnaire including six domains (Desire, arousal, lubrication, orgasm, satisfaction, and pain) and 19 items. Each score of domains and total score measured separately. The minimum and maximum score is summarized in Table 1.
By two experienced female physicians, face to face education of women about, aim of this study was done. That including: questionnaire filling, cycle of female sexual function and describe domains meaning and give insurance of complete security responses.
Illiterated women precipitated as ask-answer interview, with physicians. Serum level of glycosylated hemoglobin (HbA1C) was measured by Ion exchange with column chromatography method.
A skilled laboratorarist, was check HbA1C. Normal range of HbA/C is about 4-6.5%. level of HbA/C was categorized into four groups HbA/C < 8% 8-9.9% 10-11.9% > 12%
Various parameters were assessed and analysis was made by correlation test and chi-2 test.

Results

After analysis, data registered in eight tables. 88% of diabetic women and 72% of no diabetic women had one or more problem in domains, thus we can result that prevalence of FSD in diabetic women is more than normal females. However widespread of FSD in Ira-

Table 1. score of domains and total FSF.

	Min.score	Max.score
Desire	1.2	6
Arousal	0	6
Lubrication	0	6
Orgasm	0	6
Satisfaction	0.8	6
Pain	0	6
Total FSF score	2	36

nian normal population is remarkable too.
Mean total FSF score in diabetic women was 20.68 with SD≈ 5.26 and non diabetic women was 23.17 with SD ≈ 4.82 that is show considerable difference between severity of FSD in both groups (P<0.001),(Table 2).
The severity and prevalence of FSD increased significantly with age, especially in menopausal age (50-60 year) in both groups
(Table 2).
According data of Table 2, type of domain distress is roughly similar in two groups with a exception; in case group, desire is the most common problem and then lubrication, arousal, orgasm and pain was influenced but in control group, after desire, arousal and then orgasm lubrication and pain is involved
(Table 2).
FSD has a significant negative correlation with educational level and emotional relationships (P.v <0.001) in diabetic and nondiabetic females.
sexual function increased with improvement of lovely relations and educational state. See table 3 and 4.
The women that had chosen oral contraception pill (OCP) or tubal ligation (T.L.) for birth control, have unfavorable sexual function comparison women with natural or mechanical prevention ,that named etc in table 5. The cause of this differences is unknown, may be was due to hormonal alteration in OCP, selection of T.L by older women. That need more studies.
In normal population there is not any correlation between BMI and female sexual function. but in diabetic women there is a remarkable relation. AS was seen(table 6). Underweight and normal diabetic women have a significant difference with overweight and obese diateic women.
Finally association between severity of female sexual dysfunction and level of HbA1C is summarized Table 7,8 . When HbA1C was lower than 12% , we didn't found relation between HbA1C and female sexual function . But when HbA1C was more than 12% (severe uncontrolled diabet mellitus) , severity of FSD increased, significantly.
Type of D.M and female sexual function don't have any relations (Table 8) .

Discussion

Prevalence of female sexual dysfunction in diabetic women is higher than normal population .
In several studies, the rang of FSD is varying from 15% to 59% in diabetic women and 27% to 45% in nondiabetic women (4,5) .
In our study, not only disturbance but also severity of FSD in diabetic women is higher

Table 2. Total FSF score and age

Age	20-29		30-39		40-49		50-59		total	
Group	DM	Non DM	DM	Non DM	DM	Non DM	DM	Non DM	DM	Non DM
Mean total FSF	25.83	26.86	23.11	25.03	21.16	23.67	14.84	17.22	20.68	23.171
Std. deviation	4.382	3.32	3.910	3.167	3.184	3.1	3.769	4.318	4.825	4.825
Desire	3.8	3.7	3.3	3.5	2.8	3.3	2.1	2.3	3	3.2
Arousal	3.9	3.9	3.7	3.7	3.5	3.5	2.3	2.5	3.35	3.4
Orgasm	4.3	4.2	4	4	3.7	3.8	2.5	3.3	3.62	3.82
Lubrication	4.1	4.8	3.3	4.5	3.1	4.2	2.3	2.2	3.2	3.92
Pain	4.5	5	4	4.5	4	4.5	2.2	3	3.67	4.25
Satisfaction	5.2	5.2	4.8	4.8	4	4.3	3.4	3.9	4.35	4.55

Table 3. Sexual function in diabetic women

Contraceptive			Emotional relationships			Educational level			Variation/ FSF score
T.L	OCP	etc	Good	Moderate	Poor	Good (academic)	Moderate education	Illiterate	
16.94	20.78	23.79	26.4	20.81	16.97	25.34	19.08	17	Mean FSF score
4.362	4.793	4.537	3.518	4.684	3.802	3.985	4.100	6.110	Std. deviation

Table 4. Sexual function in non diabetic women

Contraceptive			Emotional relationships			Educational level			Variation/ FSF score
T.L	OCP	etc	Good	Moderate	Poor	Good (academic)	Moderate education	Illiterate	
19.63	23.92	23.52	26.95	21.93	18.89	24.95	22.78	18.67	Mean FSF score
5.293	4.467	3.702	3.024	4.22	4.267	3.450	4.442	7.524	Std. deviation

Table 5. Association between FSF and contraceptive.

Correlation between FSF score and type of contraceptive method	P. value
OCP with mechanical or natural	0.026
OCP with T.L.	0.000
T.L. with mechanical or natural	0.000

Table 6. Association between BMI and FSF.

Group	BMI	N	Mean TFSF	Std. deviation	P.value between
Diabetic women	-underweight (1)	7	25.86	3.716	1,2=> 0.902 3.4 =>0.915 1,3 => 0.036 1.4 => 25% 2,3 =>0.001 2.4 => 0.000
	-Normal (2)	26	24.12	4.852	
	-Overweight(3)	67	19.43	4.610	
	-Obese (4)	20	19.30	6.105	
Normal women	-underweight	12	23.83	3.157	P.v > 0.05 -
	-Normal	34	24.62	4.612	
	-Overweight	59	22.22	5.119	
	Obese	15	23.07	4.698	

Table 7. Serum level of HbA1C and FSF.

	HbA1C; <8% (Mean=7.28)	HbA1C: 8 - 9.9% (Mean=8,75)	HbA1C; 10-11.9% (Mean =10.75)	HbA1C> 12% (Mean=14.63)
Total FSF (mean)	23.48	22.15	21.307	16.82
Std. deviation	4.678	4.341	4.953	4.03

Table 8. Type of DM and FSF.

Type of D.M	Mean FSF score	Std. deviation	P.value
Type 1	22.17	5.388	0.993
Type 2	20.7	5.124	

than nondiabetic women.

In addition , prevalence of FSD in Iranian women, is more than the world researches.

Male sexual dysfunction was assessed by many centers but almost, female sexual function was neglected.

In both group, low desire, low arousal and low orgasm (in diabetic women low lubrication), are the usual disorders, that more likely to occur in diabetic and healthy women.

This domains is highly related to social, economic, psychological and interpersonal status . Thus with improvement of this condition, we will have better sexual function in community and betterment of quality of life.

In review of studies, the most problem in diabetic women was in arousal , pain and orgasm (6) in another, orgasm, arousal and desire was current distress special in younger healthy women (7) . Low desire was the most problem in diabetic women (8) . Presence of similar results in domains of FSF1 in diabetic and non-diabetic women(9).A significant difference was reported only for decrease of lubrication in diabetic women also (10) .

The prevalence and severity of FSD increased with age in both women. That may be due to old age illness, hormone alteration and etc.

An Italian study was describe that menopausal women had significant lower FSF score, but with hormone therapy, those has better sexual function (11) .

Unavailability and low active sexual function in partner and general sickness was reported as reasons of FSD in old women (13) .

Educational and emotional level positively

is associated with score of FSD (≈severity of FSD) in all of women, therefore improvement in information, about female sexual performances, understanding of desire, arousal and orgasm in normal women, correction martial intimacy and lovely relationships and foreplay are very effective factors in female sexual activity.

Partner sexual function is an important question, that should be asked and treated.

According few studies, there are correlation between BMI (13) and type of D.M (14) with FSF. In our survey no association was found between type of DM and FSF, also between BMI and FSD in non diabetic women. But in diabetic women a considerable correlation was seen between normal and overweight or obese women sexual function.

Between type of contraceptive and FSD score there are a significant correlation. women that choose T.L or OCP have FSF score lower than natural or condom method. Although statistically is important, but we think it needs for better and more studies.

DM sometimes presented in first time with sexual function that, with control of hyperglycemic status, sexual function was better (15) . After demographic analysis, it was determined when level of HbA1C was greater 12% , Severity of FSD increased. However, in HbA1C between 10-11.9% severity of FSD increasing, but is insignificantly. another studies no correlation between HbA1C and FSD was reported (4,9) . Further more one investigation similar our study, that was about erectile dysfunction and HbA1C in diabetic male, demonstrated when HbA1C >11%, severity of FSD increased (16) .

Recommendations:

Teaching about normal sexual function in diabetic and non diabetic women as a basis of evaluation.

Amelioration of economic, cultural, psychological and interpersonal linkages.

Notice to emotional and lovely relevance, foreplay before and during sexual activity, besides prepared an interview between couples and physician.

Take a careful history about sexual function in diabetic women, periodically.

Short and long-term control of diabet mellitus and hyperglycemic situation.

Improvement of BM1 in diabetic women for better sexual activity.

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