Effect of pregnancy on Female Sexual Function: a descriptive study

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Abstract

Objective: To assess female sexual function through pregnancy.

Patients & Methods: A prospective descriptive study. 282 healthy pregnant women recruited from healthy pregnant ladies with singleton pregnancy, can read and write, in an ongoing sexual relationship since at least 6 months preconception and free from maternal or fetal complications that may restrain sexual intercourse throughout pregnancy period and with FSFI total score ≥ 28.1 at baseline. FSFI questionnaire was filled in at the initial antenatal visit and at end of each gestational trimester to assess the female sexual function and dysfunction.

Results: All female sexual function domains significantly changed through pregnancy course compared to prepregnancy state. Total FSFI score had declined from 31.5 $\pm$2.5 preconception to (22.9 $\pm$7.6, 26.6 $\pm$5.8 & 19.1 $\pm$6.8) during the three pregnancy trimesters, respectively.

Conclusion: Based on the study findings it can be concluded that pregnancy influences female sexual function. Specifically, desire, arousal and satisfaction domains, they were decreased in the first trimester compared to the preconception state, while better scores were reported in the second trimester than that in the first trimester and the greatest decrease was observed in the third trimester. Pain and orgasm were decreased while lubrication was increased by advancing gestation.

Keywords: Female Sexual Function Index, female sexual functioning, female sexual dysfunction, pregnancy course.

Introduction

Female sexual functioning (FSF) means woman's ability to achieve specific sexual domains like arousal, lubrication, orgasm and satisfaction. [1] It is an important issue for quality of woman's life that results in a better well-being. Normative changes which occur during woman's reproductive life including pregnancy, childbirth, breast feeding and menopause may adversely affect the female sexual function. [2, 3]

Pregnancy represents a critical period of woman's reproductive life as it is the time of physical, psychological, and hormonal changes. These changes may negatively influence female sexual function across all of its domains or even may result in sexual dysfunction. [4] Female sexual dysfunction (FSD) means disorders of libido, arousal and orgasm and may lead to negative impact on women's quality of life, low self-esteem and emotional distress. [5]

Serati and colleagues [6] reviewed 27 articles investigating sexual function during pregnancy and concluded that the vast majority of the studied articles showed a significant decline in sexual functioning during pregnancy, particularly during the third trimester. [6] Voluminous research studies have confirmed that sexual intercourse during normal pregnancy has no significant adverse effects on pregnancy, such as an increased risk of miscarriage, premature rupture of membranes or preterm labor. [7-8]

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However, some studies showed that pregnancy had a negative influence on sexuality where most of women show a reduction in sexual activity, coital frequency, and sexual desire as pregnancy progresses. [9, 10] An Egyptian study had reported that a history of previous miscarriage was the only statistical significant negative independent predictor of coital practice during pregnancy [11,12].

Female Sexual Function Index questionnaire (FSFI) is the most widely used measure of the female sexual function. It has 6 domains including the phases of female sexual response cycle [12].

Although, sexual dysfunction is a prevalent problem affecting 25% to 92% of women [13-15], however in Egyptian community, it is immoral to discuss sexual matters in most of institutions and health care centers that provides antenatal care due to the sensitivity of this issue, this reflects upon many sexual problems among young married pregnant females. In Egypt, there were no prior studies have described prospectively the changes in female sexual function through pregnancy. Thus, the present study was carried out to assess female sexual function through pregnancy.

Materials and methods

This study is a descriptive research conducted at Antenatal clinics of Mansoura university hospitals during the period from January 2012 to March 2013, The study protocol was reviewed and approved by the department of Obstetrics and Gynecology and the Mansoura Medical Research Ethics Committee, Faculty of Medicine, Mansoura University, Mansoura, Egypt and ethical approval from the Nursing Faculty Ethics Committee was granted. Participants were recruited from pregnant women attending for antenatal care with the following inclusion criteria:

1. Healthy pregnant females $\leq$ 8 weeks gestation (determined by date of LMP and confirmed by ultrasound examination).
2. Singleton pregnancy.
3. Sexually active for at least 6 months prior to conception and on an ongoing sexual relationship and with a baseline FSFI total score $\geq$ 28.1
4. Free from maternal or fetal complications that may restrain sexual intercourse throughout pregnancy period such as threatened preterm labor or antepartum hemorrhage.
5. Can read and write and agreed to participate in this study.

Informed consent was obtained from all enrolled women after clarifying the aim of the work. Privacy was protected by collecting the required data through an individual face to face interview in a single private room.

Sample size for the current study was calculated using the following formula: $n = Z^2P(1-P)/d^2$ [14]. Where n is the desired sample size; Z is the statistic score (1.96); P is the expected prevalence of FSD based on previous study results P was set as 0.76 and d is the precision and it was set to be 0.05. [15-20]

Then by substitution of the predetermined data in the sample size formula n = $(1.96)^2$ X 0.76 X (1- 0.76)/ $(0.05)^2$ = 280.3. Thus, at least 280 pregnant women should be surveyed to achieve the study aim. Considering the dropout rate, the researchers surveyed a total of 300 pregnant mothers; unfortunately 18 pregnant mothers were declined due to variety of reasons, leaving 282 to complete the study as one group.

Two measures were used to collect the required data.
I: Interview sheet
It entails the participants' general characteristics such as age, education level, duration of marriage and parity, name, patient number and telephone number.
II: FSFI questionnaire (Arabic version).
It is a brief, multidimensional self-report questionnaire that assesses the key dimensions of female sexual function during the four weeks prior to the interview day. It comprises 19 multiple choice questions that measures 6 domains including desire domain (2questions), arousal (4questions), lubrication (4questions), orgasm (3questions), satisfaction (3questions) and sexual pain (3questions).

Each domain scored from 0/1 (no sexual activity or sexual dysfunction respectively) to 5 (suggestive of normal sexual activity). The domain score determined by adding the score of the questions that comprise the domain and multiply the sum by the domain factor (i.e., desire 0.6, arousal and lubrication 0.3, orgasm, satisfaction and pain 0.4). While the full scale score calculated by adding the six domains scores (=2 to 36). For the present study, the researchers used the Arabic version FSFI that was translated by Anis et al. as it was validated for the Egyptian population. A total score of 28.1 was taken as the cutoff point for the Arabic version FSFI to distinguish between women with FSD and those with normal function (sensitivity 96.7%, specificity 93.2%) [21], before data collection both measures were reviewed by three maternity nursing specialists and their comments were considered.

Data were collected through four phases; during the first phase, individual face to face interview was conducted between the main investigator and each participant at the initial antenatal visit ($\leq$ 8weeks), during which the researcher clarified the aim and design of the study, then assessed the women legibility for the study and collected the baseline data; FSFI data represents data

of the last month prior to conception, this interview took about 20 – 25 minutes for the initial antenatal visit to explain FSFI to each participants and didn't exceed 10 -15 minutes in subsequent phases. At the end of each interview, appointment was arranged for the next phase.

Eligible women were asked to take part in 2nd, 3rd and 4th stages of data collection. During such phases participants were asked to fill in the FSFI again at 13th, 27th and 38th gestation weeks respectively, thus the collected data represented 1st, 2nd, 3rd trimesters of pregnancy.

To keep confidentiality of data, FSFI measure was nameless but it was coded with a, b, c, or d representing preconception period, first trimester, second trimester, or third trimester respectively. For easily extraction of the declined participants; measures of each participant numbered by the same number of corresponding interview sheet thus that lost one phase her sheets extracted and withdrowed easily.

Data analysis

Continuous variables are presented as means ± standard deviations (SD). Categorical variables are reported as number and proportions. Data were checked for normality and equality of distribution, prior to any analysis being performed. Skewed continuous variables were logarithmically transformed to attain a normal distribution. The FSFI individual domains and total score in the pre-pregnancy period and during the three trimesters are compared using repeated measure ANOVA test. The participants in this study was dichotomized into two groups according to the cut-off point of the FSFI i.e. those with FSD (scored <28.1) and pregnant females with no FSD (their FSFI score was ≥28.1). The comparison between the two groups was performed using independent student's t test for the continuous variables and the chi square test for the categorical variables. All calculations were performed using SPSS 17.0 software for Windows. All analyses were 2-tailed.

Results

Table (1) shows general characteristics of the participants. It reveals that the mean ± SD of age was 26.7 ±4.4, duration of marriage was 5.1 ±2.2 and parity of the participants was 1.4 ±1.1. It also shows that about three quarters (75.5%) of the participants had high education and 75.2% reported that their income is enough. Moreover, it reveals that more than three fifths (62%) of them did not receive knowledge about sexual practice during pregnancy, 25% received knowledge but from untrusted source, meanwhile 13%

only received information from a trusted source.

Table (2) compares FSFI individual domains scores and FSFI total scores of the participants in the preconception period and during the three gestational trimesters using the repeated measure ANOVA test. During the first trimester the total FSFI score had declined from the pre-conception status (22.9 ±7.6 versus 31.5 ±2 .5 respectively). Then it had improved during the 2nd trimester (26.6 ±5.8) but still lower than that of the pre-conception status whereas it is the lowest during the 3rd trimester (19.1 ±6.8). These changes in the scores were significant (P<0.001). Additionally, the same table shows that desire, arousal and satisfaction domains were decreased in the first trimester compared to the preconception state, better scores were reported in the second trimester than that in the first trimester and the greatest decrease was observed in the third trimester. Pain and orgasm decreased while lubrication increased by advancing gestation. Differences observed were highly significant (P<0.001).

Figure (1) illustrates frequency distribution of FSD among the participants in the three pregnancy trimesters. None of the participants had scored FSFI <28.1 in the preconception period, 180 (63.8%) females in the 1st trimester, 165 (58.5%) females in the 2nd trimester, and 255 (90.4%) females in the 3rd trimester had a total score of FSFI (< 28.1). Interestingly 71 (25.2%) pregnant females had sexual dysfunction in all the three trimesters while 208 (73.8%) of the participants had sexual dysfunction in at least one trimester (data not shown).

Figure (2) shows the frequency of sexual intercourse preconception and during the three pregnancy trimesters. The frequency of intercourse during the last 4 weeks was 9.1 ± 2.2 preconception, and 6.2 ±2.5, 5.6 ±1.9 and 2.1 ±1.2 in first, second and third pregnancy trimesters respectively. The frequency of intercourse was significantly decreased with the advancing gestational age (p<0.001).

Study participants dichotomized into two groups; pregnant females with sexual dysfunction (FSFI score <28.1) and pregnant females with no sexual dysfunction (FSFI score ≥28.1). Pregnant females who had sexual dysfunction during the 1st, 2nd and 3rd trimesters were significantly older in age than those with no sexual dysfunction (p=0.003, 0.006 and 0.003 respectively). The average duration of marriage is significantly longer in the pregnant females with sexual dysfunction in the 1st, 2nd and 3rd trimesters than those with no sexual dysfunction (p=0.0013, 0.014 and 0.005 respectively). Also, pregnant females with sexual dysfunction have higher parity than those without sexual dysfunction

in the 1st, 2nd and 3rd trimesters (p=0.023, 0.024 and 0.032 respectively). Moreover, the pregnant females with sexual dysfunction had significantly lower preconception FSFI score (P<0.001 in all trimesters) than those with no sexual dysfunction (Table 3).

Discussion

This study aimed to assess the female sexual function through pregnancy. This aim was achieved through the present study findings that revealed a slight decrease of total FSFI score in the first trimester compared to the preconception state, while better scores were reported in the second trimester than that in the first trimester and again further decrease was observed in the third trimester, the present study finding indicating the influence of pregnancy on female sexual function.

Parallel with the present study findings many studies that reported the same pattern of FSF fluctuation during pregnancy [8, 22, 23]. Partially in agreement with the present study, the findings of Aslan et al. and Kuljarusnont et al. [7, 24] although, their results reassert the influence of pregnancy on FSF and activity, they reported that FSF decreases as gestational age advances.

Considering the domain type; desire, arousal and satisfaction domains were decreased in the first trimester compared to the preconception state, while better scores were reported in the second trimester than that in the first trimester and the greatest decrease was observed in the third trimester. Yet, pain and orgasm decreased while lubrication increased by advancing gestation

The above mentioned study finding related to sexual desire changes are matching with the findings of previous studies which found a fluctuation of mean sexual desire through pregnancy trimesters, with the best during the second trimester. [8, 9] Nonetheless, the same study findings are not in line with the findings of Oboro and Tabowei. [25] They have observed a better sexual experience during pregnancy among some pregnant mothers and a decrease in sexual interest during the first trimester among others than they have ever had before. Moreover, Khamis et al. [11] found that up to 37% of females indicated a general improve in sexual desire during the whole pregnancy period [11].

The previously mentioned study findings regarding changes of arousal agree with Erol et al. and Kammerer and Rogers. [26,27] They had reported that the arousal was fallen during the first trimester compared to preconception, followed by an increase during the second trimester and a greater fall during the third trimester.[26, 27]

The current study findings revealed that sexual satisfaction decreased in the first trimester compared to the preconception state, while better scores were reported in the second trimester than that in the first trimester and the greatest decrease was observed in the third trimester. Such finding is consistent with other studies which revealed that the pregnant mothers had better sexual satisfaction during the second trimester of pregnancy, [22, 24] and contradict with Khamis et al. they had reported that the majority of the pregnant women indicating the best sexual satisfaction during the third trimester with statistically significant difference [11].

Sexual desire, arousal and satisfaction were affected negatively during pregnancy, more so in the first and third trimesters compared to the second trimester, such findings could be explained by the notion that the second pregnancy trimester is considered to be the most emotionally stable and trouble free period compared to the first and third trimesters. During the second trimester, pregnancy looks to be established, and minor discomforts mostly relieved which allows an increase in orgastic quality and higher level of erotism.

The present study finding revealed that lubrication had increased with advancing gestation period. Such finding is consistent with other studies which indicated that lubrication was intensified with pregnancy progress [28, 29]. During pregnancy there is an increased production of the cervical glands at the time of sexual excitement due to the effect of estrogen resulting in excessive lubrication.

Opposite to the lubrication domain changes, the present study finding showed a decrease of orgasm domain with advanced gestation. This result consistent with Orucs et al. [28] and Haines et al. [30] they have concluded that orgasm quality adversely affected as pregnancy progressed. A more recently study indicated that only about tenth of the studied subjects reach climax at the end of intercourse although the majority have reported having been feeling orgasm before pregnancy [11]. Decreased the mean orgasm with pregnancy progress may be explained by the progressive weight gain that impair the pregnant women to take comfortable position, as well as leg cramps which are common occurrence during pregnancy; related to the imbalanced calcium/phosphorous ratio or pressure of the uterus on the nerves, that would interrupt the sexual cycle to be completed.

A research study indicated that dyspareunia is reported to be experienced by 22–50% of the pregnant women [23]. In the present study, pain was determined to decrease as the gestation age increased. Often, dyspareunia is linked with dryness of the vagina, however in the present study lubrication increased as the pregnancy

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19

progressed. The opposite finding may be related to that the elevated level of estrogen is associated with a higher risk of mycotic vaginal infections accompanied by dyspareunia.

Moreover, the present study finding revealed that the FSD among the studied sample was higher than that of Leite et al. (46.6%, 34.2%, and 73.3%) [8] and that of Kuljarusnont et al. (58.1, 61.5%, 88.5%) [24], during the three pregnancy trimesters respectively. The different results with the higher FSD among the present study participants; can be explained by the different cutoff point for FSD diagnosis. As among Egyptian females, FSD was defined as FSFI <28.1 that was described by Anis et al. [21], which is a reliable and specific for Egyptian population; while in the other studies FSD was defined as FSFI <26.55 [8, 24]. Also, the different cultures and the general characteristics of the studied samples may explain the differences of FSD among the studied sample and other samples.

The current study finding revealed that coital frequency had significantly declined with advancing pregnancy compared to pre-pregnancy. Such finding is in agreement with the other studies that found a coital frequency decrease once pregnancy was confirmed [7, 31]. Additionally, 10% of the women abstained sexual activity once pregnancy was confirmed due to religious and traditional practices [23]. Egypt is an Islamic country where there is no specific prohibition of sexual intercourse during normal pregnancy. In this study the decline in coital frequency may be attributed to a couple of reasons; firstly, it may be related to the decreased desire/interest of sexual activity experienced by the enrolled pregnant mothers. Secondly, the lack of knowledge as some women reduce or avoid sexual intercourse during pregnancy based on their perception that sexual intercourse potentially hazardous to their fetuses.

It was evident by the current study results that more than three fifths of the enrolled women (65%) indicated that they did not receive information about sexual practice during pregnancy. Furthermore, among those who received information 25% were provided from un trusted sources. Such finding highlights that the maternity nurses who are working in Antenatal Clinics are in an optimal position, which allows pregnant mothers education to improve women's awareness of the sexuality changes during this transient phase of woman's reproductive life, safety of sexual practice in normal pregnancy, thus improve their sexual function during pregnancy.

The present study revealed that sexual dysfunction was significantly increased with increase in pregnant woman's age, longer marriage duration and higher parity. Several studies have shown that sexual function is inversely related to woman's age [5, 15, 32, 33], duration of marriage [33, 34], and parity [13, 35-37]. Sexual dysfunction was significantly increased with increase in age; this may reflect the negative effect of age on the general health, which may negatively affect the sexual function. Increased marital relationship duration inversely affects FSF; this may be related to the decline in coital frequency with increasing marital relationship duration. Regarding parity, in this study number of children was 0-3 and duration of marriage 1-10 years meaning that children still young, thus they would be more time consuming and exhausting leaving less room, time, and energy for enjoyment of sexual activities.

Limitation of the study was the high drop out reported rate; as 18 pregnant women declined the antenatal care visits during their second or third trimesters after collecting their first trimester data leading the main investigator to waste more time to recollect the required data from others seeking to complete the predetermined sample size.

Conclusions

Based on the current study findings it can be concluded that pregnancy influences female sexual function. Specifically, desire, arousal and satisfaction domains, they were decreased in the first trimester compared to the preconception state, while better scores were reported in the second trimester than that of the first one and the greatest decrease was observed in the third trimester. Yet, pain and orgasm decreased while lubrication increased by advancing gestation. Additionally, FSD was high during the first trimester compared to none during preconception, decreased during the second trimester, and then increased sharply during the third trimester.

Recommendations

1. Sexual education programs should be implemented early during adolescent, premarital, preconception and during pregnancy periods to improve woman's knowledge related to sexual health matters.
2. Replicating the research using a larger, random sample that target women in different age groups and from different settings.

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Table (1): General characteristics of the participants

Age (years)	
Range	19 – 34
Mean ±SD	26.7 ±4.4
Duration of marriage (years)	
Range	1 – 10
Mean ±SD	5.1 ±2.2
Parity	
Range	0 – 3
Mean ±SD	1.4 ±1.1
Income	
Not enough (n, %)	70 (24.8%)
Enough (n, %)	212 (75.2%)
Education	
Low (n, %)	69 (24.5%)
High (n, %)	213 (75.5%)
Source of knowledge about sexual practice during pregnancy	
Trusted source (n, %)	37 (13.1%)
Un trusted source (n, %)	71 (25.2%)
Non	174 (62.7%)

Low education: primary or preparatory education.

High education: secondary or university education.

Not enough income: income is insufficient to meet the family basic needs.

Enough income: income is sufficient to meet the family basic needs +/- saving

Trusted source: Obstetricians, nurses, television, or radio.

Un trusted source: mother, friend...etc

Table (2): FSFI individual domains scores and FSFI total scores of the participants in the preconception period and during the three gestational trimesters

FSFI domains	Preconception Mean ±SD	1st trimester Mean ±SD	2nd trimester Mean ±SD	3rd trimester Mean ±SD	ANOVA test F	P
Desire	4.9 ±1.2	2.9 ±1	3.9 ±1.1	2.5 ±1.4	232.570	<0.001
Arousal	4.7 ±1.3	3.8 ±1.3	4.8 ±1.2	3.2 ±1.3	104.962	<0.001
Lubrication	4 ±1.3	4.9 ±1.4	5.6 ±1.3	5.9 ±1.4	110.225	<0.001
Orgasm	4.8 ±1.2	3.6 ±1.1	3.3 ±1.1	3.2 ±1.4	105.144	<0.001
Satisfaction	5.5 ±1.2	3.3 ±1.4	5.5 ±1.3	3 ±1.4	169.600	<0.001
Pain	5.7 ±1.4	4.3 ±1.5	4.1 ±1.6	3.6 ±1.5	105.359	<0.001
Total	31.5 ±2.5	22.9 ±7.6	26.6 ±5.8	19.1 ±6.8	208.859	<0.001

Table 3. Comparison of the age, duration of marriage, parity and preconception FSFI total score between women with and without sexual dysfunction

|	Pregnant females with FSFI score ≥28.1	<28.1	95% CI	Student's t test P
1st trimester				
N	133	149		
Age (years)	25.9 ±4.5	27.5 ±4.5	-2.657, -0.543	0.003
Duration of marriage (years)	4.8 ±2.3	5.5 ±1.2	-1.124, -0.276	0.0013
Parity	1.3 ±1.1	1.6 ±1.1	-0.558, -0.042	0.023
Preconception FSFI	32.8 ±2.3	29.9 ±2.5	2.335, 3.456	<0.001
2nd trimester				
N	150	132		
Age (years)	26.3 ±4.4	27.8 ±4.2	0.42, 2.44	0.006
Duration of marriage (years)	5 ±2.2	5.6 ±2.1	0.13, 1.15	0.014
Parity	1.4 ±1.1	1.7 ±1.1	0.04, 0.55	0.024
Preconception FSFI	32 ±2.5	30 ±2.5	-2.6, -1.45	<0.001
3rd trimester				
N	90	192		
Age (years)	25.9 ±4.3	27.5 ±4.3	-2.71, -0.55	0.003
Duration of marriage (years)	4.7 ±2.1	5.5 ±2.2	-1.33, -0.54	0.005
Parity	1.3 ±1.1	1.6 ±1.1	-0.58, -0.03	0.032
Preconception FSFI	31.9 ±2.5	30.7 ±2.6	0.67, 1.98	<0.001
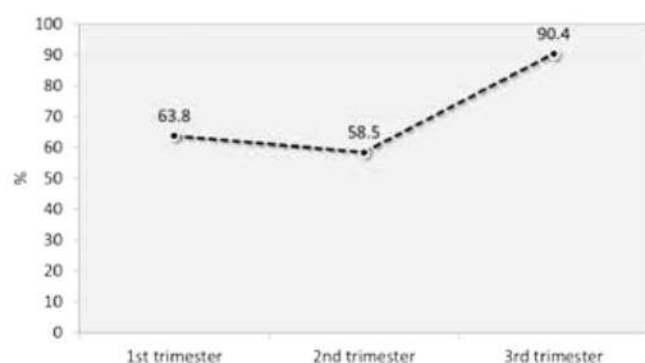
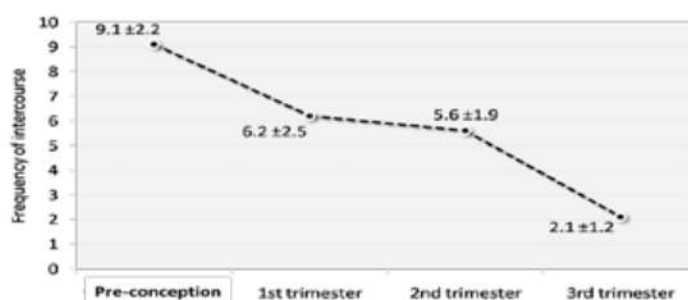Figure 1. Frequency distribution of FSD among the participants in the three pregnancy trimesters

Figure 2. Frequency of sexual intercourse preconception and during the three pregnancy trimesters