# Sexual Function of Primiparous Women After Elective Cesarean Section and Normal Vaginal Delivery

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**Purpose:** To compare sexual function between two groups of women who had normal vaginal delivery (NVD) and planned cesarean section (PCS).

**Materials and Methods:** In this cross-sectional study, two groups of healthy women, with antenatally normal singleton pregnancies at term, who underwent NVD (n = 114) or PCS without labor (n = 99), have been retrospectively studied. Sexual function of participants was assessed using physician-administered Female Sexual Function Index (FSFI) questionnaire before pregnancy and 6 and 24 months after delivery. Primary outcome measures were questions 3 to 6 and 14 to 16 from FSFI questionnaire. Secondary outcome measures included the remaining items.

**Results:** There were no significant differences regarding six domains of sexual function, including desire ($P$ = .55), arousal ($P$ = .39), lubrication ($P$ = .45), orgasm ($P$ = .36), pain ($P$ = .74), and satisfaction ($P$ = .39) between the two groups. Eighty percent of women who had undergone vaginal delivery complained from hypotonic pelvic floor muscles.

**Conclusion:** We believe that PCS is not preferred to NVD in regard to preserving normal sexual functioning.

**Keywords:** women's health, cesarean section, postpartum period, sexual dysfunction, sexual behavior

## INTRODUCTION

Sexual dysfunction in women is defined as inability to achieve or enjoy orgasm.[1] The accurate prevalence of female sexual dysfunction is unknown; however, in our community 31.5% of women suffer from some types of FSD. Sexual dysfunction can influence physical, mental, and social aspects of individuals' lives; hence, nowadays more attention is given to the sexual health.[2]

Some studies have reported that sexual health may be affected by the mode of delivery.[3] The pudendal nerve which innervates the clitoris, vulva, and perineum, may be damaged during vaginal delivery by infant's head pressure and/or forceps.[4] Furthermore, hypotonic muscles of the vagina due to vaginal prolapse can lead to decreased ability to achieve orgasm.[5]

Adverse effects of vaginal delivery on sexual function have been reported previously.[4,5] These studies have demonstrated that undergoing cesarean section (CS) keeps vaginal strength, preserves normal sexual function, and maintains anatomical and functional arrangement of the pelvic floor and intrapelvic organs.[6] Accordingly, CS has high popularity and attitudes of women, midwives, and obstetricians have changed towards CS.[3] A recent English survey found that 33% of obstetricians (19% of female obstetricians) would choose a planned CS (PCS) for themselves or their partner.[7]

About 80% to 93% of women restart their sexual activity during the first three months after delivery. During this period, about two-thirds of women experience at least one sexual dysfunction, such as vaginal dryness, pain, decreased libido, and lack of orgasm.[8] Many researchers believe that problems, such as dyspareunia, low back pain, and sexual dysfunction, are due to the pelvic floor muscles' relaxation, perineal lacerations, or pudendal nerve damage during normal vaginal delivery (NVD). Some studies have reported less dyspareunia after CS.[9] Other studies have shown a relationship between dyspareunia and NVD.[10-12] These findings have reported the presences of sexual dysfunction six months after delivery, which may be due to conditions like reduced serum level of progestin, emotional factors, breastfeeding, or changes in body image after childbirth.[11]

There are limited studies about long-term effects of two types of deliveries on sexual function with different results being reported. Dean and colleagues showed that six years after delivery, sexual satisfaction and vaginal muscles tone are significantly less in women with NVD than the women who had undergone a CS.[13] On the other hand, Baytur and associates showed no significant relationship in sexual function among women with different types of delivery six months to two years after delivery.[14]

Due to conflicting results in relation to sexual function after the NVD and CS, we aimed to compare sexual function in women after the NVD and PCS.

## MATERIALS AND METHODS

In this cross-sectional study, we compared sexual function in primiparous women 6 to 24 months after CS and NVD from June 2009 to September 2010. The study has been approved by the Medical Ethics Committee of Tehran University of Medical Sciences. A total of 268 women who had been referred to the health clinics at Tehran University of Medical Sciences were recruited consecutively. The participants were informed of the purpose of the study and gave their informed consent. Furthermore, confidentiality was ensured.

Inclusion criteria were being in the age range of 19 to 29 years, having a singleton NVD with a mediolateral episiotomy or PCS in hospitals affiliated to Tehran University of Medical Sciences with live children, no history of stillbirth or miscarriage, having at least five years of elementary education, and living with the husband. The exclusion criteria

included having a child with anomalies, preterm delivery, previous pelvic surgery, history of previous marriage, history of subfertility, body mass index > 30, consuming medications with adverse effects on sexual function (eg, blood pressure lowering drugs, anti-arrhythmia drugs, sedative drugs, and tricyclic antidepressants), having physical or mental problems, presence of relationship problem with husband, mental retardation, smoking and alcohol consumption, and having a critical incident, such as the death of relatives in the past year. All of the subjects should have normal sexual functioning before pregnancy according to female sexual function index (FSFI) questionnaire.[15]

After initial screening, 213 women met study criteria and recruited into the study. Data were collected using a physician-administered questionnaire. The questionnaire included 14 items on demographic characteristics and FSFI questions.

The demographic characteristics included age, educational level, spouse's educational level, occupational status, spouse's employment, duration of marriage, monthly income, type of delivery, infant's gender, weight and head circumference at birth, contraceptive methods used, and history of breastfeeding.

The sexual function of women were assessed using FSFI in six domains including: 1. Sexual orientation (2 items); 2. Arousal (3 items); 3. Vaginal lubrication (4 items); 4. Orgasm (3 items); 5. Sexual satisfaction (3 items); and 6. Dyspareunia (3 items). We scored the standardized Iranian version of the questionnaire as follows: The items 1 to 16 had five Likert-type answers from "Never" (score 1) to "Very much" (score 5). The items 16 to 18 were leveled from "Very much" (score 1) to "Never" (score 5). Adding the score of the individual items that comprise the domain and multiplying the sum by domain factor obtained individual domain score. Factors were 0.6 for desire, 0.3 for arousal and lubricant, and 0.4 for orgasm, pain, and satisfaction. The full-scale score range was from 2.0 to 36.0. The questionnaires were completed in a private setting.

**Statistical Analysis**

Data were presented as mean ± standard deviation unless otherwise stated. Differences in variables between groups were determined with the Student's two tailed *t* test and One-way ANOVA for dichotomous and normally distributed continuous variables, respectively. Proportions were compared using Chi-Square test. Analysis of variance was used to test for significance of the difference between means in groups. For obtaining adjusted *P* values, a multivariable regression model was used to adjust for potential confounding factors. Statistical analysis was performed using the SPSS software (the Statistical Package for the Social Sciences, Version 17.0, SPSS Inc, Chicago, Illinois, USA). *P* values less than .05 were considered significant. All of the reported *P* values are adjusted for confounding factors, namely, age, duration of marriage, educational level, contraception methods, and occupational status.

## RESULTS

The baseline characteristics of the patients who completed the study protocol are shown in Table 1. Of 268 recruited subjects, 249 met the study criteria, and of whom, 213 (99 with CS and 114 with NVD) completed whole study period. Demographic characteristics did not differ significantly between the two groups. The findings showed that most of the women were aged 25 to 29 years old in both groups. A majority of the participants had at least high school education, were housewives, and used natural method for contraception. Most of the women had breastfed their children. The majority of the participants had duration of less than five years for marriage. In both groups, the age of the spouses was between 30 and 40 years ($P > .05$).

There was no significant difference regarding different domains of sexual function, including sexu-

**Table 1.** Demographic characteristics.

| Variables | Normal Vaginal Delivery (n = 114) | Planned Cesarean Section (n = 99) | *P* |
|---|---|---|---|
| Mean age, y | 25 ± 3.2 | 25 ± 3.4 | .92 |
| Duration of marriage, y | 3 ± 1.7 | 3 ± 1.5 | .82 |
| Education level, n (%) | | | |
| Primary school | 0 (0.0) | 0 (0.0) | ------ |
| High school | 94 (82.5) | 82 (83.8) | .74 |
| Graduate | 20 (17.5) | 16 (16.2) | .073 |
| Contraception methods, n (%) | | | |
| Condom | 26 (22.8) | 26 (26.3) | .067 |
| OCP | 13 (11.4) | 8 (8.1) | .072 |
| IUD | 25 (21.9) | 27 (27.3) | .032 |
| Withdrawal | 42 (36.8) | 35 (35.4) | .43 |
| Others | 8 (7.0) | 3 (3.0) | .054 |
| Occupational status, n (%) | | | |
| Unemployed | 85 (74.6) | 72 (72.7) | .71 |
| Employed | 29 (25.4) | 27(27.3) | .43 |

OCP indicates oral contraceptive; and IUD, intrauterine device.

al desire ($P$ = .55), sexual arousal ($P$ = .39), vaginal lubrication ($P$ = .45), ability to reach orgasm ($P$ = .36), sexual satisfaction ($P$ = .39), and pain disorder ($P$ = .74) between the two groups (Table 2). There was also no significant difference between the overall sexual function scores between the two groups of women ($P$ = .91).

Regarding the question that asked whether the NVD had any adverse effect on their sexual function and the reproductive tract, of patients in NVD group, 92 (80.7%) responded that it caused vaginal relaxation. However, out of 92 women, only 17 (14.9%) believed that vaginal wall relaxation adversely affected their sexual function. We also examined whether breastfeeding confounded the observed associations. The correlation between breastfeeding and total FSFI scores with mode of deliveries did not reach statistical significance ($P$ = .64 for CS and $P$ = .085 for NVD).

## DISCUSSION

Postpartum period is defined as the interval between childbirth to six weeks later. Postpartum period health is prospectively divided into three phases: 1) from birth to six weeks postpartum; 2) from six weeks to six months after delivery (short-term postpartum); and 3) from six months to two years after delivery (long-term postpartum).[16] We studied the effect of mode of delivery on sexual functioning during long-term postpartum period.

In this study, the subjects either had NVD with a mediolateral episiotomy or underwent PCS. The results of this study showed that women in the NVD group and the women with CS had no significant difference in the six domains of sexual function, including sexual desire, sexual arousal, vaginal lubrication, sexual satisfaction, pain, and orgasm. In a study by Hannah and colleagues, no significant differences were reported between the results of sexual function three months to two years postpartum among women who had undergone NVD and CS.[17] Furthermore, other studies showed that mode of delivery was not an affecting factor on sexual function after one year of deliv-

**Table 2.** Domain scoring of FSFI in 24-month follow-up.[†]

| FSFI domains | Normal Vaginal Delivery | Planned Cesarean Section | *P** |
|---|---|---|---|
| Desire | 5.98 ± 1.37 | 6.09 ± 1.31 | .55 |
| Arousal | 9.33 ± 2.08 | 9.57 ± 2.05 | .39 |
| Orgasm | 10.05 ± 2.13 | 9.79 ± 1.96 | .36 |
| Pain | 9.42 ± 2.4 | 9.54 ± 2.59 | .74 |
| Lubrication | 12.11 ± 2.16 | 11.89 ± 2.02 | .45 |
| Satisfaction | 8.93 ± 1.29 | 8.78 ± 1.26 | .39 |
| Sexual function | 21.39 ± 3.13 | 21.34 ± 2.70 | .91 |

[†] FSFI indicates female sexual function index.

* *P* values are adjusted for confounding factors, namely, age, duration of marriage, educational level, contraception methods, and occupational status.

ery.[5,13,18]

Safarinejad and associates evaluated the effect of the mode of delivery on the quality of life, sexual function, and sexual satisfaction in primiparous women and their husbands.[3] They concluded that women with vaginal delivery and emergency CS had statistically significant lower FSFI scores as compared with PCS women. Their findings disagree with our results. In line with their findings, Baksu and coworkers also found significant relationship between the type of delivery and sexual function six months after delivery.[19] These findings differ from the results of the present study. This may be due to small number of subjects, different type of study population, a restricted age range of the population, and differences in study design. Our study assessed the sexual function up to two years after delivery; however, the mentioned studies were carried out during six months to one year postpartum. Therefore, the decreased sexual function may be due to the reduced progesterone as a result of breastfeeding or emotional factors, such as changes in self-image, the relationship between the partners, and altered body image early in childbirth.[14] It is also reported that the fear of women after NVD results in increasing frustration and pain and decreasing sexual desire and vaginal lubrication,[19] which usually disappear within the first year of delivery.[14]

Women who had undergone NVD were not satisfied with their vaginal muscles tone; however, its impact on sexual satisfaction was low. It is clear that damages to the pelvic floor muscles and fascia and nerves are unavoidable consequences of vaginal delivery, particularly, difficult ones. During childbirth, the pelvic floor is exposed to direct pressure of fetal head. These forces cause functional changes in nerves, muscles, and connective tissues[7] and result in relaxation of the vagina and inability to achieve orgasm in women.[5] The orgasm is described as the most gratifying sexual feeling. This feeling require answers from smooth and skeletal muscles during the sexual stage of motivation. During orgasm, rhythmic contractions occur in the pelvic floor muscles, including levator ani and anus.[14] Accordingly, the reduced tone of the pelvic floor muscles due to vaginal delivery can result in inability to reach orgasm.[7]

According to the study by Signorello and colleagues, the degree of perineal injury during assisted vaginal delivery was correlated with the ability to have orgasm.[20] We excluded the women who had assisted vaginal deliveries and who had 3rd- or 4th-degree lacerations from our study. Furthermore, we did not measure the muscle tone. Nevertheless, our findings suggested that there

was no significant difference in achieving orgasm between the women with NVD and women who had undergone PCS. Baytur and associates reported that the pelvic floor muscle tone significantly reduced in women with NVD; however, there was no significant relationship between the vaginal muscle tone and sexual dysfunction.[14] Dean and coworkers also reported that six years after delivery, sexual satisfaction and vaginal muscle tone were significantly lower in the women with NVD comparing to those with CS.[13]

One advantage of this study was using valid Persian version of the FSFI questionnaire. Furthermore, we controlled the impact of age by limiting our study to women aged 19 to 29 years. We also tried to control other confounding factors on sexual function, such as employment status, educational level, and monthly income.

This study has some limitations. First, it was a self-reported survey. We made every effort to explain all the questionnaire items to the participants to obtain valid responses. The second limitation of the study is that we did not address the husbands' views. The third drawback is that we had no equipments to measure the muscle tone exactly. Finally, we did not study the sexual function across different parities.

## CONCLUSION

We concluded that women with NVD were less satisfied with their vaginal muscle tone compared to the women who had PCS. However, there was no significant difference between the mode of delivery and the six domains of sexual function between the two groups. Therefore, it can be suggested that NVD has little impact on the sexual function of the women two years after delivery. Hence, undergoing PCS in order to preserve sexual function is not recommended.

## CONFLICT OF INTEREST

None declared.

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