
GYNAECOLOGY

Female Sexual Dysfunction among Thai Women Using Hormonal Contraception versus Tubal Sterilization

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ABSTRACT

Objectives: Contraception is accepted worldwide by women to prevent unintended pregnancy. This study was aimed to evaluate female sexual function in women using hormonal contraception and tubal sterilization.

Materials and Methods: This was a cross-sectional study. Sexually active women 20-45 years old who used hormonal contraception or underwent tubal sterilization for at least 3 months were included. The participants self-completed the Thai version of the female sexual function index (FSFI) questionnaire to determine female sexual dysfunction (FSD) which consisted of six domains including sexual desire, sexual arousal, lubrication, orgasm, sexual satisfaction and pain. Demographic data were collected.

Results: A total of 310 women were recruited for this study. There were 155 participants who used hormonal contraception (79 used oral combined contraceptive pills, 56 used the depot medroxyprogesterone acetate (DMPA) and 20 used an implant) and 155 women underwent tubal sterilization. The prevalence of FSD was 70.9% and 64.5% in hormonal contraception group and tubal sterilization group. There was no statistically significant difference in the FSD between the groups ($p = 0.224$). The overall median FSFI score for hormonal contraception users was marginally and statistically significantly lower than tubal sterilization group ($p = 0.054$). Meanwhile, parity was the only significant associated factor that affected the FSD (adjusted odds ratio 3.32, 95% confidence interval 1.43 - 7.70).

Conclusion: The prevalence of FSD was high in both hormonal contraception users and the tubal sterilization group. Parity was the only significant associated factor that affected FSD.

Keywords: female sexual dysfunction, hormonal contraception, tubal sterilization.

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ผลของการคุมกำเนิดด้วยฮอร์โมนเปรียบเทียบกับการทำหมันหญิงที่มีต่อกิจกรรมทางเพศในสตรี

รัชฎา วิศวาไพศาล, เจน ไสธรวิทย์, หลิงหลิง สาลัง, ประนอม บุพศิริ

บทคัดย่อ

วัตถุประสงค์: การคุมกำเนิดเป็นที่ยอมรับทั่วโลกในการป้องกันการตั้งครรภ์ไม่พร้อม เพื่อศึกษาเปรียบเทียบกิจกรรมทางเพศของสตรีระหว่างการคุมกำเนิดด้วยฮอร์โมนและการทำหมัน

วัตถุประสงค์และวิธีการ: เป็นการศึกษาแบบตัดขวาง ในผู้หญิงอายุ 20-45 ปี ที่การคุมกำเนิดด้วยฮอร์โมนหรือทำหมันเป็นระยะเวลาอย่างน้อย 3 เดือน อาสาสมัครจะได้ทำแบบสอบถามชนิดถามตนเอง (Female Sexual Function Index questionnaire) เพื่อประเมินความบกพร่องทางเพศ ประกอบด้วย 6 หัวข้อหลัก คือ ความต้องการทางเพศ การกระตุ้นทางเพศ การหลั่งน้ำหล่อลื่น การถึงจุดสุดยอด ความพึงพอใจ และการเจ็บขณะมีการสอดใส่ และมีการเก็บข้อมูลส่วนตัว

ผลการศึกษา: อาสาสมัครทั้งหมดจำนวน 310 คน แบ่งเป็น 155 คน ใช้การคุมกำเนิดด้วยฮอร์โมน (79 รับประทานยาเม็ดคุมกำเนิด 56 คน ฉีดยาคุมกำเนิดและ 20 คน ผีงคุมกำเนิด) และ 155 คนทำหมัน พบว่าอัตราความชุกของการเกิดความบกพร่องทางเพศ คือ ร้อยละ 70.9 และร้อยละ 64.5 ในกลุ่มที่คุมกำเนิดด้วยฮอร์โมนและทำหมัน ตามลำดับ ซึ่งพบว่าไม่มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติ ($p = 0.224$) ผลรวมค่าเฉลี่ยของคะแนน Female Sexual Function Index (FSFI) ในกลุ่มที่การคุมกำเนิดด้วยฮอร์โมนมีค่าน้อยกว่า เกือบจะแตกต่างกันอย่างมีนัยสำคัญทางสถิติ เมื่อเทียบกับกลุ่มที่ทำหมัน ($p = 0.054$) ในขณะที่จำนวนบุตรเป็นปัจจัยเดียวที่มีนัยสำคัญทางสถิติที่มีผลต่อความบกพร่องทางเพศ (adjusted odds ratio 3.32, 95% CI = 1.43 - 7.70)

สรุป: อัตราความชุกของการเกิดความบกพร่องทางเพศสูงทั้งในกลุ่มที่คุมกำเนิดด้วยฮอร์โมนและทำหมัน และจำนวนบุตรเป็นปัจจัยเดียวที่มีนัยสำคัญทางสถิติที่มีผลต่อความบกพร่องทางเพศ

คำสำคัญ: ความบกพร่องทางเพศ Female sexual function index, การคุมกำเนิดด้วยฮอร์โมน, การทำหมัน

Introduction

The World Health Organization (WHO) has defined sexual health as the state of physical, emotional and social well-being with respect to sexuality⁽¹⁾. Sexual life complexity is affected by many factors, that include medication and biological functions such as hormonal status, physical wellbeing, aging, and psychological health that in itself includes depression, anxiety, and self-image. Interpersonal factors that include relationship status and partner's sexual function plus sociocultural entities such as ethnicity, religion, and culture all may affect sexual health⁽²⁾. Although sexual dysfunction is not a threat to life, it affects the quality of life, marital status, self-esteem, and physical and emotional health.

The contraception method is one factor that has an effect on female sexuality^(3, 4). A study from Africa reported a strong association of hormonal contraception and female sexual dysfunction⁽⁴⁾. Although the benefit of contraception to prevent pregnancy outweighs the side effects such as nausea, dizziness, breast tenderness, vaginal spotting, these events might interfere with sexual relations. Currently, there are inconsistent data regarding the association between hormonal contraception and female sexual dysfunction (FSD)⁽⁵⁾. The effects range from negative to even positive⁽⁵⁻⁷⁾. Interestingly, many studies reported that non-hormonal contraception such as tubal sterilization is also a risk factor of FSD^(8, 9). One study reported the high prevalence of female dysfunction in Thai women using an intrauterine device⁽¹⁰⁾. Even though hormonal contraception and female sterilization are commonly used in Thailand, there was scarce evidence regarding sexual function related to contraceptive methods. Furthermore, sexual practices and perception are varied among women with different ethnicities^(11, 12). Thus, this study was aimed to evaluate female sexual function in women using hormonal contraception compared with those using tubal sterilization in Thai women.

Materials and Methods

This study was a cross-sectional study based on the female sexual function index (FSFI) questionnaire conducted between October 2019 and March 2020 at

Srinagarind Hospital, Khon Kaen University, a tertiary care hospital in Khon Kaen, Thailand. Patients who came for an annual checkup at the gynecologic outpatient clinic were approached. The inclusion criteria were an age between 20-45 years old, who had used hormonal contraception (oral combined contraceptive pills, depot medroxyprogesterone acetate (DMPA), implant) or had undergone female sterilization at least 3 months previously, were sexually active within 4 weeks, and had no recent pelvic infection, abnormal pathology or underlying disease. The menopausal women, using emergency pills, and breast feeding women were excluded. Written informed consents were obtained.

FSD is defined as a disorder featuring the disturbance of orgasm, sexual Interest/arousal, and genito-pelvic pain⁽¹³⁾.

To assess sexual function, the eligibility participants were approached and explained the questionnaire by a well-trained research assistant. All participants were asked to complete demographic data and a validated FSFI questionnaire (Thai version) in a private room which took about 10 minutes to complete the questionnaire.

FSFI is a questionnaire specifically designed and validated for evaluating female sexual function. The questionnaire consists of six domains, 19 items, including sexual desire (2 questions), sexual arousal (4 questions), lubrication (4 question), orgasm (3 questions), sexual satisfaction (3 questions) and pain during sexual intercourse (3 questions). Each item score ranged from 0 - 5 except for items 1, 2, 15 and 16, each of which had the range between 1 and 5. Factors were 0.6 for desire, 0.3 for arousal and lubrication, and 0.4 for orgasm, satisfaction and pain. The total score was obtained by adding the six domain scores (full score 36). The higher scores indicating better function in each domain. The total score of less than 26.55 was determined as FSD⁽¹⁴⁾. The FSFI questionnaire has been translated and validated in many countries. In this study, the Thai version of the FSFI questionnaire translated by the Mapi Research Trust was used.

The study was approved by the institutional review board of the Khon Kaen University Ethics Committee on Human Research (HE621338).

Based on Kunkeri 's study⁽¹⁶⁾, the prevalence of FSD after tubal sterilization was 71.7%. In this study, it was assumed that 20% better in hormonal contraception users. In order to achieve a power of 80% and a level of significance of 5%, at least 143 participants were needed in each group. Incomplete data were added as 10%.

Statistical analysis

Data analysis was performed by the STATA program version 10.1. Categorical data were reported in number and percentage. Continuous data were shown in mean \pm standard deviation (SD) or median and interquartile range (IQR). Associated factors that affected sexual function were reported as a percentage by using the Pearson Chi-square test. FSFI domain and total scores were calculated and reported as the median and IQR and the Kruskal-Wallis test was used

with non-normal distribution of data. Multivariate logistic regression analysis was performed to compare the associations between dependent and independent variables. The p value < 0.05 was considered to be statistically significant.

Results

During the enrollment period, 393 eligible women were approached and 83 women refused to complete the FSFI questionnaire. Three- hundred and ten women were recruited for this study. One hundred fifty-five participants used hormonal contraception (79 used an oral combined contraceptive pills-OCP, 56 used DMPA and 20 used implants) and 155 women had undergone tubal sterilization. The mean age of the hormonal contraception group was significantly lower than the tubal sterilization group (32.9 ± 6.9 vs 38.3 ± 4.7 , $p < 0.001$). Baseline characteristics of participants using hormonal contraception or tubal sterilization are shown in Table 1.

Table 1. Baseline characteristics of participants (n = 310).

Parameters	Hormonal contraception (n = 155)	Tubal sterilization (n = 155)	p value
Age (years)	32.9 ± 6.9	38.3 ± 4.7	< 0.001
20 - 35	94 (60.6)	40 (25.8)	
36 - 45	61 (39.4)	115 (74.2)	
Duration of use (years)			< 0.001
< 1	52 (33.5)	9 (5.8)	
1-5	60 (38.7)	50 (32.3)	
> 5	43 (27.7)	96 (61.9)	
BMI (kg/m ²)	22.9 ± 4.3	23.5 ± 4.1	0.516
< 18.5	15 (9.7)	14 (9)	
18.5 - 22.9	75 (48.4)	66 (42.6)	
> 23	65 (41.9)	75 (48.4)	
Parity			< 0.001
none	41 (26.5)	0 (0)	
1	78 (50.3)	7 (4.5)	
> 1	36 (23.2)	148 (95.5)	

Table 1. Baseline characteristics of participants (n = 310). (Cont.)

Parameters	Hormonal contraception (n = 155)	Tubal sterilization (n = 155)	p value
Route of delivery			< 0.001
Vaginal delivery	69 (44.5)	85 (54.8)	
Cesarean delivery	41 (26.5)	49 (31.6)	
Both	5 (3.2)	21 (13.5)	
Never	40 (25.8)	0 (0)	
Occupation			0.239
Government	79 (50.9)	77 (49.7)	
Private employee and others	54 (34.8)	65 (41.9)	
Housewife	22 (14.2)	13 (8.4)	
Income (Baht/month)			0.971
< 10,000	17 (10.9)	17 (10.9)	
10,000 - 30,000	72 (46.5)	70 (45.2)	
> 30,000	66 (42.6)	68 (43.9)	
Educational level			0.001
Primary school	4 (2.6)	18 (11.6)	
Secondary school	68 (43.9)	78 (50.3)	
Bachelor degree and above	83 (53.5)	59 (38)	

Data are presented as mean ± standard deviation and number (percentage)

BMI: body mass index

Overall, the prevalence of FSD was 67.7%. The prevalence of FSD was higher in the hormonal contraception group compared to the tubal sterilization

group (64.5% vs. 70.9%). The differences between both groups, however, did not reach statistical significance (p = 0.224) (Table 2).

Table 2. Associating factors affected female sexual function (n = 310).

Parameters	n	Female sexual dysfunction (%)	p value
Type of contraception			0.224
Hormonal contraception	155	110 (70.9)	
Tubal sterilization	155	100 (64.5)	
Age (years)			0.956
20 - 35	134	91 (67.9)	
36 - 45	176	119 (67.6)	
Duration of use (years)			0.248
< 1	61	44 (72.1)	
1-5	110	68 (61.8)	
> 5	139	98 (70.5)	

Table 2. Associating factors affected female sexual function (n = 310). (Cont.)

Parameters	n	Female sexual dysfunction (%)	p value
BMI (kg/m ²)			0.005
< 18.5	29	13 (44.8)	
18.5 - 22.9	141	92 (65.2)	
> 23	140	105 (75)	
Parity			0.002
none	41	23 (56)	
1	85	70 (82.3)	
BMI (kg/m ²)			0.005
< 18.5	29	13 (44.8)	
18.5 - 22.9	141	92 (65.2)	
> 23	140	105 (75)	
Parity			0.002
none	41	23 (56)	
1	85	70 (82.3)	
> 1	184	117 (63.5)	
Route of delivery			0.088
Vaginal delivery	154	102 (66.2)	
Cesarean delivery	89	67 (75.2)	
Both	26	19 (73)	
Never	41	22 (53.6)	
Occupation			0.395
Government	156	99 (63.4)	
Private employee and others	120	87 (72.5)	
Housewife	34	24 (70.5)	
Income (Baht/month)			0.730
< 10,000	34	25 (73.5)	
10,000 - 30,000	142	96 (67.6)	
> 30,000	134	89 (66.4)	
Education level			0.445
Primary school	22	17 (77.2)	
Secondary school	146	101 (69.1)	
Bachelor degree and above	142	92 (64.7)	

BMI: body mass index

The hormonal contraception users had lower FSFI scores in all aspects especially in desire domain (p = 0.035) (Table 3). The overall median

FSFI score in the hormonal contraception users was marginally statistically significantly lower than the tubal sterilization group (p = 0.054) (Table 3).

Table 3. Female Sexual Function Index score in hormonal contraception and tubal sterilization group.

Domain	Hormonal contraception (n = 155)	Tubal sterilization (n = 155)	p value
Desire	3 (2.4, 3.6)	3.6 (3, 3.6)	0.035*
Arousal	3.6 (2.7, 3.9)	3.6 (3, 3.9)	0.061
Lubrication	4.2 (3.6, 4.8)	4.2 (3.6, 5.1)	0.286
Orgasm	4.4 (3.6, 4.8)	4.4 (3.6, 5.2)	0.14
Satisfaction	4.8 (3.6, 5.2)	4.8 (3.6, 5.2)	0.438
Pain	4.4 (3.6, 4.8)	4.4 (3.6, 5.2)	0.149
Total score	23.6 (19.6, 27.1)	25 (21.4, 28)	0.054

Data are presented as median (interquartile range). * Kruskal-Wallis test

When the hormonal contraception users were classified into type and route of administration, the

lowest FSFI score was found in the implant group (median = 20.05, IQR = 19-26) (Table 4).

Table 4. Female sexual function index score in difference type and root of administration of hormonal contraception.

Domain	Oral combined pill (n = 79)	DMPA (n = 56)	Implant (n = 20)
Desire	3 (2.4, 3.6)	3 (2.4, 3.6)	3 (2.1, 3.6)
Arousal	3.6 (3, 3.9)	3.6 (2.7, 3.75)	3 (2.4, 3.6)
Lubrication	3.6 (3.6, 4.8)	4.2 (3.6, 4.8)	4.2 (3.3, 4.65)
Orgasm	3.6 (3.6, 5.2)	4.4 (3.6, 4.8)	4 (3, 4.6)
Satisfaction	4.2 (3.6, 5.2)	4.8 (3.6, 4.8)	4.8 (3.4, 5.4)
Pain	4 (3.6, 4.8)	4.4 (3.6, 4.8)	4.4 (3.6, 5)
Total score	23.9 (20.7, 27.4)	23.6 (19.3, 26.3)	20.05 (19, 26)

Data are presented as median (interquartile range)

Associated factors that affected FSD, body mass index (BMI) and parity had a statistically significant association (Table 2). When a multivariate logistic regression model was conducted, parity was the only factor that remained significantly associated with FSD (adjusted odds ratio 3.32, 95% confidence interval (CI) 1.43 - 7.70) (Table 5). Age

was considered to be an important confounder. Although the difference was not significant (Table 5), we included this factor into the logistic regression model. Furthermore, we also reclassified the parity in this analysis. The results, however, did not change (adjusted odds ratio 3.37, 95%CI 1.44 - 7.88).

Table 5. Multivariate logistic regression modeling predicting female sexual dysfunction.

Parameter	Adjusted odds ratio	95% confidence interval
Type of contraception		
Hormonal contraception	reference	reference
Tubal sterilization	0.96	0.47 - 1.96
BMI (kg/m ²)		
18.5 - 22.9	reference	reference
< 18.5	0.50	0.22 - 1.15
> 23	1.64	0.97 - 2.79
Parity		
none	reference	reference
1	3.32	1.43 - 7.70
> 1	1.28	0.53 - 3.13

BMI: body mass index

Discussion

The prevalence of FSD among women using hormonal contraception or who underwent tubal sterilization was very high. Approximately two-thirds of both groups had FSD. The median FSFI score of all domains in the hormonal contraception user group was marginally statistically significantly lower than tubal sterilization group. The possible explanation is that hormonal contraception causes female sexual function that includes: 1) increased levels of sex hormone-binding globulin (SHBG)⁽⁵⁾. High SHBG serum levels can reduce free testosterone levels since testosterone has a high affinity for SHBG⁽¹⁷⁾, 2) suppressed ovarian production of androgen is linked to vaginal dryness and decreased lubrication^(7,17), 3) oral hormonal contraceptives produce side effects (headache, dizziness, vaginal spotting). These factors could decrease sexual arousal, sexual satisfaction, orgasm frequency and cause increased sexual pain⁽⁴⁾. Interestingly, the prevalence of FSD in the hormonal contraception group in this study was two times higher

than the results from a study of European women using OCP⁽¹⁸⁾. A systematic review in 2013 also revealed that ethnicity is able to modulate the risk of sexual dysfunction⁽¹⁹⁾. A higher prevalence of FSD was observed in Southeast Asian women than in other global regions. The belief in that religion guides sex and culture may play an important role in the negative impact on sexual problems in Asian populations^(2, 20).

The prevalence of FSD was 64.5% in the tubal sterilization group. This finding was lower than the recent report from India in which FSD was found to be in 71.1% of women who had undergone sterilization⁽¹⁶⁾. The psychological impact, such as post-sterilization regret, was proposed to be the explanation in those with sexual function decline⁽⁵⁾. Furthermore, the decrease in ovarian blood flow from dissecting of the ovarian branch of uterine artery during sterilization could result in hormonal changes⁽⁸⁾. The study from a western country, however, demonstrated no change or even a positive effect⁽³⁾.

The median FSFI scores of all domains were

comparable among all types of contraception. Implants users reported the lowest total scores. A recent cross-sectional study from the Contraceptive CHOICE Project showed an increased odds of decreased sexual interest in implant users (adjusted OR 1.60, 95%CI 1.03-2.49)⁽²¹⁾. A study from Italy, however, showed a slow yet increased positive impact on sexual life⁽²²⁾. This inconclusive effect needs a further well-designed study to be elucidated.

For the associated factors, the type of contraception, BMI, and parity were included in the multivariate model of FSD that seemed to increase with increasing BMI. The association did not reach a significant level in this study. On the contrary, a study in Thai women using IUDs showed that FSD was mainly affected in underweight women⁽¹⁰⁾. Concern about body image and low self-esteem are the plausible explanations for the influence of abnormal weight in both ways on sexual function. Parity was the only significant associated factor that affected FSD in this analysis. Latest evidence indicated that sexual activity was infrequent and more problematic among primiparous lactating women compared to multiparous women⁽²³⁾. Conversely, parity was reported to be associated with FSD in a study from Bangladesh (adjusted OR 3.4, 95%CI 1.21-9.68)⁽²⁴⁾. A long term effect of parity on sexual function has not been well understood.

To the authors' knowledge, this study is the first study comparing sexual function in women using hormonal contraception and tubal sterilization, however, the present study also had some limitations. This study was unable to establish a causal link between contraceptive methods and sexual dysfunction. Many confounding factors were unable to evaluate including type of progestin in hormonal contraception, compliance, duration after delivery, frequency of sexual relations, relationship status and partner's sexual function. A prospective study to measure the effect of contraception on the change in sexual function would be beneficial. Although the prevalence of FSD might be higher in an Asian population, the proportion found in this study was still exceptionally high in both groups. The difference of sexual function between the methods of interest could

be masked. Nevertheless, sexual function assessment should be incorporated in family planning services because of the possible sequelae of contraceptive methods. Exercising, intimate communication and sex education, the protective factors of FSD, should be addressed and empowered by healthcare personnel⁽²⁵⁾. If applicable, women with severe FSD should be referred to specialist.

Conclusions

The prevalence of female sexual dysfunction was high in both hormonal contraception users and the tubal sterilization group. Although female sexuality is very complex, sexual function assessment should be incorporated as a part of the counselling process to provide optimum care.

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Potential conflicts of interest

The authors declare no conflicts of interest.

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