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Female Sexual Function in DMPA and Cyclofem

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Abstract:
Objective*: To compare sexual function of women using Depo-Medroxyprogesterone Acetate (DMPA) and Cyclofem with Female Sexual Function Index (FSFI).*
Method: *This descriptive-comparative study was conducted on 120 women in Medan on November 2017 until January 2018. They were selected by consecutive sampling and data was collected using FSFI questionnaire. Data was analyzed by descriptive statistics, Chi-square and Mann-Whitney test. The p-value less than 0.05 were applied for all statistical tests as significance level.*
Result: *Majority of participants in this study were 30-39 years and multiparous. The majority of subjects in both groups were normal in body mass index. Most subjects of DMPA and cyclofem did not experience sexual dysfunction, with DMPA and cyclofem users who did not experience sexual dysfunction was 62.5% and 77.5%, respectively. There were differences in sexual function based on FSFI in desire domain (p = 0.024) with mean of cyclofem score lower than DMPA, lubrication (p <0.000) and pain (p <0.000) with mean of DMPA score lower than cyclofem. Whereas in arousal, orgasm and satisfaction domain were shown no significant differences. There was a significant difference between the sexual function of the DMPA compared to cyclofem with p=0.038.*
Conclusion: *There was a significant difference between the sexual function of the DMPA compared to cyclofem and cyclofem group shown better sexual function.*
Keywords: *Female sexual function, FSFI, DMPA, cyclofem.*

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I. Introduction

Female sexual dysfunction is defined as sexual desire, orgasm, sexual arousal, and pain disorder which results in personal stress. An international survey of 4.507 women aged 18 to 59 showed that 34% of participants experienced a decrease in sexual desire, and 19% were not interested in sexual relations.[1]

The Female Sexual Function Index (FSFI) was developed as a short multidimensional instrument to assess the dimensions of sexual function in women. These measurements have been validated in samples of women with sexual arousal disorders and control samples of women without sexual disturbances.[2]

Previously, a study showed relevance of testosterone, estradiol and certain peptides (oxytocin, endorphin and prolactin) to sexual arousal in women.[3]

Since the rate of population growth increases and food sources are not sufficient, birth control is considered as one of the important solution in order to control the growth rate of population. Increased use of injectable contraceptives due to its desirable characteristic, inexpensive, not related to coitus, easy to use, noninvasive, reversible and long-acting effect.[4]

Depo medroxyprogesterone acetate (DMPA) was used as a contraceptive method in the US in 1992. Because of the side effects of DMPA, another injecting drug were used including cyclofem with fewer side effects.[4]

Previously there were several studies associates hormonal contraceptive with female sexual dysfunction. Kariman et al. showed that sexual dysfunction is more common among DMPA users compared to combined oral contraceptives. Casey et al. explained that although some hormonal contraceptives are related to sexual dysfunction, several studies have shown varying results depending on the route of administration and components of the progestin. Wiebe et al. also observed 978 women who used hormonal contraception, and 358 women (38%) experienced at least one sexual side effect.[5-9]

In other studies in Iran comparing the effects of combined oral contraceptives and cyclofem on female sexual dysfunction showed that differences in sexual function were not significant, but in the dimensions of desire and arousal it was better for oral contraception compared to cyclofem. Wallwiener et al. conducted a survey of 1,086 women who showed users of oral contraceptives had lower FSFI scores than non-users. A

recent study by Ozgoli et al. showed that there was no significant difference in the overall FSFI score between DMPA users compared to cyclofem, but DMPA users had better sexual desire and cyclofem users felt less pain during intercourse.[10-12]

In Indonesia, Saputra et al. showed that the incidence of sexual dysfunction in hormonal acceptor was higher than IUD acceptor. Ratnasari et al. compared the differences in sexual function and features of vaginal epithelium in DMPA users (1 year and 3 year), which showed a significant difference between non acceptors, 1 year and 3 year users.[13,14]

Sexual dysfunction is a problem that often occurs in women, and can be assessed by FSFI which has been used as a recognized index in the world. One of the causes of this disorder is due to hormonal changes that could be caused by hormonal contraception. The most common used hormonal contraception in Indonesia is injectable, either monthly or every three months. There have been many studies, both in Indonesia and in other countries, that show a relationship between contraceptive hormonal injection and sexual dysfunction, but there are still few studies comparing female sexual dysfunction between DMPA and cyclofem.

II. Method

This comparative descriptive study with sectional design was conducted at Medan Johor Health Center - Medan from November 2017 to January 2018. The population of this study were women who used DMPA and cyclofem. The subjects of the study were population who visited a family planning clinic at Medan Johor Health Center to get contraceptive injection. The subject size in this study was calculated using the formula for comparative analytical tests with two groups unpaired and the subjects of each group were 80. The subjects were selected by consecutive sampling.

After obtaining approval from the Ethics Committee of the Medical Faculty of University of Sumatera Utara, data were collected at Medan Johor Health Center. Women who eligible according to inclusion criteria were given informed consent. The subjects then filled out the FSFI questionnaire and data were tabulated and analyzed statistically.

Data were reevaluated and then with software. Characteristics data were analysed descriptively. Scoring was determined from the answers of each question from the FSFI questionnaire that has been filled in and then determined the type and sexual function of each subject. Kolmogorov-Smirnov test was used to test data normality. The Mann-Whitney test is used because data were not normally distributed to determine differences of type of sexual dysfunction between DMPA and cyclofem groups. To analyze differences in sexual dysfunction between DMPA and cyclofem, we used chi square test. Statistical analysis uses a 95% confidence interval (CI). The relationship is significant if the value of $p < 0.05$.

III. Result

Table 1. Characteristics of subjects

Characteristic		Subject	
		Cyclofem (%)	DMPA (%)
Age (Year)	20-29	26 (32.5)	38 (47.5)
	30-39	54 (67.5)	42 (52.5)
Parity	Primipara	17 (21.2)	35 (43.8)
	Multipara	63 (78.8)	45 (56.2)
Body Mass Index	*Normoweight*	46 (57.5)	50 (62.5)
	Overweight	30 (37.5)	27 (33.8)
	Obese	4 (5.0)	3 (3.7)
Duration of use of contraception	6-12 months	58 (72.5)	47 (58.8)
	> 12 months	22 (27.5)	33 (41.2)

Subjects who used DMPA and cyclofem those more than 30 - 39 years were 52.5% and 67.5%, respectively. Subjects who used DMPA and cyclofem were mostly multiparous with 56.2% and 78.8%, respectively. Based on Body Mass Index (BMI), it showed that the subjects who used DMPA were mostly normoweight (62.5%), followed by overweight (33.8%) and those who used cyclofem were also mostly normoweight (57.5 %), followed by overweight (37.5%).

Table 2. Comparison of Sexual Function Domain based on FSFI in DMPA and Cyclofem

Domain	Contraception				*p**
	Cyclofem (Mean ± SD)		DMPA (Mean ± SD)		
Desire	3.83	0.57	4.15	1.01	**0.024**
Arousal	4.22	0.61	4.02	0.62	0.112
Lubrication	4.95	0.65	3.93	0.98	**0.000**
Orgasm	4.58	0.86	4.33	0.92	0.119
Satisfaction	4.63	0.93	4.83	0.89	0.157
Pain	5.22	0.69	3.77	1.07	**0.000**

* *Mann Whitney* test

It is found that the mean value of desire is lower for cyclofem than for DMPA (3.83 ± 0.57 vs 4.15 ± 1.01) with p value = 0.024. The mean lubrication value for cyclofem and DMPA are 4.95 ± 0.65 and 3.93 ± 0.98, respectively, which is statistically significantly higher for cyclofem. Cyclofem mean pain value was higher than DMPA (5.22 ± 0.69 vs. 3.77 ± 1.07) with a p value <0.00. In stimulation, orgasm and satisfaction domain, there is no statistically significant difference in the mean value.

Table 3. Comparison of Sexual Function in DMPA and Cyclofem

Sexual Function	Contraception						*p**
	Cyclofem		DMPA		Total		
	n	%	n	%	n	%	
No Sexual Dysfunction	62	77.5	50	62.5	112	70	**0.038**
Sexual Dysfunction	18	22.5	30	37.5	48	30	
Total	80	100	80	100	160	100	

***** *Chi Square* test

The table showed that in this study DMPA group mostly (62.5%) did not experience sexual dysfunction, but in cyclofem group, subjects who did not experience sexual dysfunction were much more (77.5%). Chi square test showed that there was a significant difference between sexual function of DMPA and cyclofem group (p <0.05).

IV. Discussion

In a study conducted by Wiebe on 1,311 women who used hormonal contraception, 358 (38%) women felt sexual side effects. This is slightly higher than the results of our study (30%) (Table 1).[5]

In this study, it was found that most DMPA and cyclofem users did not experience sexual dysfunction (Table 3). This is because sexual function is not only affected by hormones. Studies that examine relationship and physical or mental health factors, indicate that these factors contribute more to sexual function than menopausal status or hormonal levels.[15,16]

Psychological and social effects when choosing effective contraception can offset the possibility of changes in serum hormone levels. Some women may increase their sexual desire due to effective contraception. Some may experience various side effects with few influences on mood, body image, or sensations that can affect sexuality. The main reason for complaining about cessation is not sexual side effects but physical and emotional side effects, relationship changes, and abnormal bleeding. All of these problems are enough to negatively affect sexual function. Overall, changes in sexuality occur in individual response patterns that cannot be predicted by a single factor.[17]

In Table 2, it can be seen that there is a significant difference in sexual desire between the DMPA and cyclofem groups, and the average value of sexual desire scores in women using DMPA is higher than Cyclofem. One mechanism of hormonal contraceptive methods is to suppress or prevent the release of LH and FSH from the pituitary gland, which results in increased levels of SHBG. In decreased libido, testosterone is bound to SHBG and caused free testosterone decreases. This is supported by an increase in estrogen.[18]

These results are consistent with Pazandeh et al. study in Iran which compared sexual function between users of combined oral contraceptives and cyclofem. But in Pazandeh study, there were also lower score on stimulation and there was no significant difference in FSFI scores between the two acceptors. The decrease in desire in cyclofem users is caused by a decrease in serum testosterone levels.[11]

The first stage in sexual response cycle is stage of desire. Sexual desire causes passion to have sexual relations. Sexual response is strengthened by norepinephrine, dopamine, oxytocin, serotonin, and is inhibited by prolactin and GABA. However, it has been found that biological factors do not affected it solely and are influenced by environmental factors. Women's sexual desire is influenced by their psychological status, beliefs and values, hopes, sexual preferences, priorities and environmental conditions. Sexual desire peaked at the age of 20 to 40 years, and decreased afterwards.[19]

Androgens have an important role in sexual function in women, especially testosterone, as evidenced by the results of clinical trials of transdermal testosterone therapy. This therapy improves sexual function and sexual satisfaction in women who experience hypoactive sexual desire disorder in postmenopausal women. Total and free testosterone, androstenedione and dehydroepiandrosterone (DHEA) sulfate (DHEAS) levels are associated with lower sexual desire. But there is no androgen cut value that can be used to assess women with low sexual function or candidates for therapy.[20]

Various studies have examined the relationship between female sexual function and androgen levels. In 1986, Alder et al. observed that low libido during breastfeeding was associated with low E2 and T levels, and Appelt and Strauss reported side effects of antiandrogen therapy in female libido. In another small study, low T was associated with a low frequency of intercourse and loss of sexual desire.[20]

In a study in Australia with large subjects of 1,021 women aged 18 to 75 years, it showed a consistent relationship between androgen and sexual function in women. In a study of 560 healthy Danish women aged 19-25, showed total and free testosterone values associated with sexual desire in women 19 to 24 years, while both hormones added with androstenedione and DHEAS were associated with sexual desire of women aged 25 to 44 years.[20]

Exogenous estrogen is associated with a decrease in active testosterone levels. This is due to the effects of estrogen in increasing SHBG production that caused increase of binding of free testosterone. This explains that contraceptives containing estrogen will reduce free testosterone and potentially have a significant impact on sexual desire.[17,18]

In study comparing sexual function between combined oral contraceptives (COC) with DMPA, the DMPA group experienced more sexual dysfunction. Sexual stimulation and lubrication were lower in the DMPA group. The results of this study are in accordance with the results of our research with low lubrication, but not the value of stimulation (Table 2). This low lubrication as a result of reduced estrogen levels causes reduced blood supply to the vagina, affecting lubrication and resulting pain during sexual intercourse. Estradiol, nitric oxide, and polypeptides have important effects on epithelium and vaginal lubrication, and estrogen has a major role in the effectiveness of these factors. Adequate levels of estradiol are needed to maintain vaginal lubrication and prevent dyspareunia.[3,6,15,21]

Lubrication problems in this study are in accordance to Veisi et al. which examined the comparison of DMPA and cyclofem in side effects and the reason for discontinuation of contraception. They conducted research on 250 women aged 18-40 years with 6 months of use. Complaints of lubrication problems were experienced by 13 (10.40%) women in DMPA and 5 (4%) women using cyclofem with a significant difference with $p < 0.05$. But this lubrication problem is not the reason for stopping the contraceptive method, and according to the researchers this is due to a time limit (six months).[4]

Other results in this study were significant differences between the two methods of contraception in the pain domain. The mean pain score for cyclofem is higher than for DMPA (Table 2). The study by Nijland et al. showed that reduced estrogen levels lead to reduced blood supply to the vagina, thus affecting lubrication and resulting pain during sexual intercourse.[21]

Estradiol, nitric oxide, and polypeptides have important effects on epithelialization and vaginal lubrication, and estrogen has a major role in the effectiveness of these factors. Adequate estradiol levels are needed to maintain vaginal lubrication and prevent dyspareunia.[1]

In this study, estradiol levels in cyclofem users were not measured. However, Modelska et al. have conducted research and showed an increase in sexual function due to the influence of estradiol levels.[22]

Contrary to the results of Schaffir et al. who argued that estradiol levels had no effect on dyspareunia and lubrication in women. They assume that many women who use DMPA experience amenorrhea, which can affect their sexual desire or sexual pleasure due to unexpected bleeding. [23]

In a study conducted by Saptatangtrakul comparing sexual function between contraceptive users of DMPA and IUD, showed no differences in sexual function based on FSFI scores. But in the pain domain, DMPA score is statistically lower than score on IUD. This is consistent with the results of our study which showed a lower DMPA score in the pain domain. This could be due to the hypoestrogenic effect of DMPA which causes vaginal mucosa atrophy, vaginal dryness and dyspareunia. [9]

In this study, it also showed the orgasm and satisfaction domain did not show any differences between DMPA and cyclofem users although there were significant differences in other domains (Table 2). This is consistent with Basson et al. who argued that although a woman experiences symptoms of sexual disorders, women can still enjoy sexual relations. Also in women who are not afraid of an unwanted pregnancy can enjoy sexual relations with a higher sexual function score.[24]

In Table 2 it can be seen that in satisfaction domain, there is lower mean of cyclofem than DMPA, although not significantly different, whereas in other domains the average value is higher in cyclofem users. The feelings of women towards their partners, or changes in partners, are identified as the main factors that affect women's desire, responsiveness, and sexual satisfaction. Acute stress can also interfere with the capacity to experience sexual satisfaction and orgasm. Women can feel physical satisfaction without experiencing orgasm. Based on survey data, several psychosocial factors are associated with female sexual satisfaction and desire. Among them are past and present mental health, positive emotional feelings and self-image, past sexual experiences, positive feelings for the partner, and positive expectations for the relationship.[25-28]

Our results are different from Ozgoli et al. In Ozgoli's study, sexual function in cyclofem were slightly higher than DMPA (65.8% vs 60.8%) but statistically not significantly different, whereas in our study there were significant differences with sexual function in cyclofem (77 5%) that higher than DMPA (62.5%) with $p < 0.05$ (Tables 2 and 3). Our study is consistent with Ozgoli et al. on desire domain with mean cyclofem score is lower than DMPA, and in the pain domain where mean DMPA score is lower than cyclofem. Domain of stimulation, orgasm and satisfaction showed no significant difference in the score of each domain between

DMPA and cyclofem. But there is a difference in lubrication score where in Ozgoli et al. study there was no difference in the mean score, whereas in our study it was found that the average score of DMPA had a lower value than the cyclofem (p <0,000) (Table 2).[10]

Our results are not in accordance with some previous studies. Oksuz et al. investigated risk factors for sexual dysfunction in 518 Turkish women aged 18 to 55 years and showed that risk factors for sexual dysfunction in women were age, smoking, diet, menopause and marital status. While other factors such as education, income, chronic diseases and contraceptive use are not related to sexual dysfunction.[29]

Similarly, Schaffir et al. compared oral contraceptives with progestin injections in their effects on sexual function. They found that although contraceptive users had significantly different levels of hormones, they did not show differences in sexual function as measured by FSFI. Wallwiener et al. also got the same results which showed no relationship between hormonal contraceptive use and the incidence of sexual dysfunction in women. They examined the association of oral contraceptive use with sexual function in 752 women in Germany and showed no significant difference in FSFI scores, although oral contraceptive users had lower FSFI values than non-users.[12,23]

There are several limitations in this study. First, this study is a cross-sectional study. It cannot compare sexual function before and after the use of contraceptive methods. Second, partner sexual dysfunction and interpersonal relationships were not investigated. Effective factors in sexual function are the age of the partner and his health status. With increasing age of the couple, increased erectile and ejaculatory dysfunction, fatigue, work, and stress can affect male sexual function, and of course in women. These factors can affect women's sexual function.[11]

V. Conclusion

There was difference in sexual function based on FSFI domain in DMPA and cyclofem on desire domain with mean cyclofem score was lower than DMPA, lubrication and pain with mean DMPA score was lower than cyclofem. Whereas in arousal, orgasm and satisfaction domain, there were no significant difference. In female sexual function, it was found that cyclofem was better than DMPA.

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