

Sexual Dysfunction in Two Types of Hormonal Contraception: Combined Oral Contraceptives versus Depot Medroxyprogesterone Acetate

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ABSTRACT

Background & aim: Sexual health is an essential element of quality of life, affecting both physical and psychological domains. Hormones used in contraceptive methods have contradictory effects on sexual function. In this study, we aimed to compare sexual function in women using combined oral contraceptives (COC) and depot medroxyprogesterone acetate (DMPA), referred to healthcare centers affiliated to Shahid Beheshti University of Medical Sciences in Tehran, Iran in 2013.

Methods: This descriptive, comparative study was performed on 240 women (n=120 per group), selected through multistage sampling in Tehran, Iran. A questionnaire consisting of three parts, General Health Questionnaire (GHQ-28), demographic characteristics, and Female Sexual Function Index (FSFI), was completed through interviews. For data analysis, descriptive statistics were calculated, and independent t-test, Mann-Whitney test, Chi-square, and Fisher's exact test were performed, using SPSS version 16. P-value less than 0.05 was considered statistically significant.

Results: The mean age at marriage in women using DMPA was lower than those using COC (18.55±3.61 vs. 19.92±3.98 years). Based on the findings, the menstrual status in the majority of DMPA users was irregular (46.7% in DMPA group vs. 8.3% in COC group). The difference in sexual function between the COC and DMPA groups was significant. Sexual arousal and lubrication were more favorable in the COC group in comparison with the DMPA group; also, pain in this group was lower than the DMPA group. Scores of total sexual function (27.35±5.22 in DMPA group vs. 29.15±6.13 in COC group), sexual arousal (4.11±0.90 in DMPA group vs. 4.51±1.39 in COC group), and vaginal lubrication (4.82±1.30 in DMPA group vs. 5.26±1.35 in COC group) were lower in the DMPA group, compared to the COC group. Pain scores (4.91±1.25 in DMPA group vs. 5.28±1.19 in COC group) were higher in the DMPA group in comparison with the COC group (P<0.05).

Conclusion: Sexual dysfunction seems to be more prevalent among DMPA users. Therefore, healthcare providers should pay particular attention to sexual function and contraceptive methods. Also, we recommend further research to determine the best way to inform women about the potential risks and benefits of hormonal contraception.

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Introduction

On the verge of the third millennium, family is still considered as the main pillar of different

communities. Marital satisfaction affects the quality and status of general health and influences

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one's satisfaction with life. Sexual relations partly form a couple's understanding of one another (1). In fact, satisfactory sexual functioning plays an important role in improving women's health and quality of life.

Sexual dysfunction as the main root of communicative conflicts among couples, can lead to doubts and concerns about partnership interests and sustainability of the relationship (2). Moreover, sexual dysfunction can reduce an individual's capabilities and creativity (3). The prevalence of sexual function disorders varies in different areas. The prevalence of sexual dysfunction has been reported to be 48.3% in Turkey (4), 22% in Chile (5), 27% in Morocco (6), and 49% in Brazil (7). In Iran, the prevalence of sexual dysfunctions ranges from 8.5% (8) to 19.2% (9) and 31.5% (10).

In this regard, in a study by Ramezani Tehrani et al. (2014), the prevalence of sexual dysfunctions was estimated at 27.3%, and the frequency of sexual desire, arousal, lubrication, and orgasmic disorders was 18.6%, 39.9%, 18.9%, and 27.3%, respectively. In their study, 56.1% of women had dyspareunia, and 15.2% were dissatisfied with their sexual life (11). In fact, sexual problems account for 88% of registered divorces (12).

Sexual dysfunction may be related to hormonal contraceptive methods (13). Approximately 200 million pregnancies occur each year in the world, about 75 million of which are unintended. In addition, almost 50 million unintended pregnancies are aborted each year. Most cases of abortion (95%) are reported in developing countries, leading to the possible death of at least 200 women each day (14).

According to previous studies performed in Iran, one-third of pregnancies are unintended (15). However, the risk of unintended pregnancy is lower among women who use hormonal contraceptive methods (16). These methods are considered desirable, as they are convenient and effective, without causing any interference in sexual intercourse (2).

The efficiency of depot medroxyprogesterone acetate (DMPA) is similar to sterilization (17). Also, combined oral contraceptives (COCs) are safe and effective options for the prevention of pregnancy. Following permanent sterilization methods, COC, containing estrogen and proge-

sterone, has the highest rate of consumption among women (18). Overall, COC is a highly effective method that is favored by women, given its simplicity and non-interference with sexual intercourse.

Sex hormones such as estrogen and progesterone can exert different effects on women's sexual behaviors and function through affecting vaginal tissues and the central nervous system (19). According to the literature, hormones used in contraceptive methods have contradictory effects on the sexual function of women at reproductive ages (20). In a previous study, only 38% of the participants continued the use of oral contraceptives, 47% discontinued the use of these contraceptives, and 14% switched to other preparations (21).

Women using hormonal contraceptive methods may experience positive, negative, or no effects on their libido (22). In a previous study, 27% of women using hormonal contraceptive methods were forced to terminate the use of these methods due to sexual dysfunction (23). In a study performed in Germany, hormonal contraceptive methods decreased the libido and sexual arousal (24). Also, Battaglia et al. (2011) found that COC use induced a significant decline in the frequency of intercourse per week and reduced the frequency of orgasm during intercourse (25).

In studies by Burrows et al. (2012) and Wiebe et al. (2011), no sexual dysfunction was reported in women using hormonal contraceptive methods (21, 26). In addition, in a study by Kingsley and Salem (2010), no evidence could support the notion that use of injectable hormonal contraceptives could change women's sexual behaviors (27). In Iran, Hajian et al. (2015) revealed no significant relationship between sexual dysfunction and hormonal contraceptive methods (28). Also, in a study by Ozgoli et al. (2015), no significant difference was found in sexual dysfunction between DMPA and cyclofem users, whereas sexual desire was more favorable and sexual pain was lower in DMPA users in comparison with cyclofem users (29).

Despite numerous studies in this area, mechanisms of sexual disorder in hormonal contraceptive methods remain unknown and cannot be predicted for all women (21). The sexual effects of hormonal contraceptive

methods remain controversial, resulting in their discontinued use (30). In some cultures, sexual relations are openly discussed, while in other societies, they remain implicit and even inaccessible.

Use of any of the discussed approaches is related to sociocultural, political, and religious interactions governing a society. In this study, DMPA and COC could affect sexual function. Effective methods are available for regulating fertility, although none are definitely complication-free (31). Women are faced with many challenges when choosing contraceptive methods and should consider the benefits and side-effects of each method (32). In this study, we compared sexual function among women using DMPA and COC, referring to healthcare centers affiliated to Shahid Beheshti University of Medical Sciences, Tehran, Iran in 2013.

Materials and Methods

This descriptive, comparative study was performed at healthcare centers affiliated to Shahid Beheshti University of Medical Sciences in Tehran, Iran during May and November 2013. The study sample was selected through multistage sampling. The regions where the healthcare centers were located were divided into four geographical zones, i.e., North, South, West, and East. Then, two centers were randomly selected from each region, and the subjects (n=240) who were selected through convenience sampling were divided into two equal groups (n=120 per group). The sample size was calculated, using the following formula:

$$n \geq \frac{(z_{\alpha} + z_{\beta})^2 \sigma^2 (2)}{\varepsilon^2} = 108,$$

$$\alpha = 0.05 \Rightarrow z_{\alpha} = 1.65, 1 - \beta = 0.90 \Rightarrow z_{\beta} = 1.28,$$

$$\varepsilon = \mu_1 - \mu_2, \sigma = 0.40$$

A total of 120 samples were allocated to each group. After obtaining permission from the university authorities, the study objectives were explained to the participants. In addition, written informed consents were obtained from all women and their partners. Women were interviewed in private settings, and they were assured about the confidentiality of their personal information. Participation in the study was voluntary and the subjects were

interviewed during a 20-minute session.

The inclusion criteria were as follows: 1) Iranian nationality; 2) use of contraceptive methods for at least three months; 3) no lactation; 4) no addiction in women or their partners; 5) no known psychological disorders in women or their partners; 6) no use of antidepressants by women or their partners; 7) no particular adverse events such as death of relatives or incurable diseases in family members; and 8) no change of residence, retirement, or job loss in one or both partners.

In total, 277 women were considered eligible for the study. Considering the impact of depression and anxiety on sexual function, the 28-item General Health Questionnaire (GHQ-28) was first completed by the participants and scored on a Likert scale. The final version of the questionnaire has been translated into Farsi and has been used in previous studies (33, 34). The GHQ items were scored based on a four-point Likert scale (not at all= 0, almost normal= 1, above normal= 2, and extremely above normal= 3).

GHQ consists of four subscales, including somatic symptoms (7 items), anxiety and sleep disorders (7 items), social dysfunction (7 items), and depressive symptoms (7 items). Scores ≥ 22 indicated the need for receiving psychiatric counseling. In the present study, Cronbach's alpha coefficient and reliability of GHQ were estimated at 0.92 and 0.88, respectively. Based on the test results, 20 samples were excluded from the study (scores ≥ 22).

Finally, of 124 women enrolled in the DMPA group, four cases were removed (one case due to unwillingness to continue the study and three cases due to psychological disorders). Also, of 133 women allocated to the COC group, 13 cases were removed due to different reasons (eight cases due to unwillingness to continue the study and five cases due to the use of antidepressants). Finally, 240 subjects were divided into two equal groups (n=120 per group).

DMPA ampoule (Caspian Tamin Pharmaceutical Co., Iran), containing 150 mg of medroxyprogesterone acetate, was injected every three months. Also, COC (Aburaihan pharmaceutical Co., Tehran, Iran), containing 0.15 mg of levonorgestrel and 0.03 mg of ethinylestradiol, was continuously used over three weeks at the

healthcare centers. A questionnaire was used for data collection, which was completed by the researchers through interviews.

This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences, Tehran, Iran. The applied questionnaire consisted of three parts. The first part comprised of GHQ, the second part contained 33 demographic questions, and the third part was the Female Sexual Function Index (FSFI), which has been used in various studies (35, 29). FSFI consists of 19 questions and is rated on a six-point Likert scale (sexual desire: two questions, sexual arousal: four questions, vaginal lubrication: four questions, sexual orgasm: three questions, sexual pain: three questions and sexual satisfaction: three questions).

Sexual function was evaluated over the past four weeks, using FSFI. Scores below 28 indicated unfavorable sexual function (maximum score: 36); the highest score in each domain was six. Content validity was evaluated to confirm the validity of the questionnaire. Also, the internal consistency of the questionnaire was confirmed, using Cronbach's alpha coefficient ($\alpha=0.81$). For reliability assessment, retest was performed over a 10-day

interval ($r=0.83$). To analyze the data, descriptive statistics were calculated, and Chi-square and Fisher's exact tests were used to compare the qualitative variables. Independent t-test and Mann-Whitney test were used to compare the mean sexual function and its domains between the study groups. Independent t-test, Mann-Whitney test, Chi-square, and Fisher's exact test were performed, using SPSS version 16 Data analysis was performed in SPSS V.16 (SPSS Inc., Chicago, IL, USA). Normality of data was assessed using one-sample Kolmogorov-Smirnov test. P-value less than 0.05 were considered statistically significant.

Results

This study was conducted on 240 women, whose demographic characteristics are presented in Table 1. The difference in age of marriage and menstrual status between the COC and DMPA groups was significant ($P<0.05$). Sexual function was favorable in 60.8% of women in the DMPA group and 73.3% of women in the COC group. In terms of sexual function, scores of sexual arousal and lubrication and the total sexual function were

Table 1. Distribution of the characteristics of subjects using combined oral contraceptives (COC) and depot medroxyprogesterone acetate (DMPA)

Variables	COC group (N=120)	DMPA group (N=120)	Test result	P-value
Age Mean \pm SD	29.58 \pm 5.42	28.63 \pm 7.16	2.14	P=0.21*
Duration of use, Mean \pm SD	50.58 \pm 7.13	47.56 \pm 6.98	0.93	P=0.62*
Age of marriage, Mean \pm SD	19.92 \pm 3.98	18.55 \pm 3.61	1.97	P=0.03*
Menstrual status, n (%)				
Regular	107(89.2)	26(21.6)	X ² =2.32	P<0.001**
Irregular	10(8.3)	56(46.7)		
Amenorrhea	3(2.5)	38(31.7)		
Education, n (%)				
Illiterate	3(2.5)	12(10)	X ² =0.69	P=0.61**
Primary school	18(15)	14(11.7)		
Secondary school	20(16.7)	26(21.7)		
High school	67(55.8)	56(46.6)		
Academic education	10(12)	12(10)		
Religion, n (%)				
Muslim	120(100)	117(97.5)		P=0.43***
Others	0(0)	3(2.5)		

*Independent t-test

**Chi-square

***Fisher's exact test

Table 2. Comparison of sexual function in subjects using combined oral contraceptives (COC) and depot medroxyprogesterone acetate (DMPA)

Domains	COC group (N=120) Mean±SD	DMPA group (N=120) Mean±SD	Test results	P-value
Desire	3.85±1.31	3.65±1.20	Z=-0.278	0.228
Arousal	4.51±1.39	4.11±0.90	Z=-1.944	0.010
Lubrication	5.26±1.35	4.82±1.30	Z=-3.317	0.011
Orgasm	5.03±1.36	4.83±1.26	Z=-1.782	0.232
Pain	5.28±1.19	4.91±1.25	Z=0.022	0.020
Satisfaction	5.21±1.05	5.01±1.25	Z=-0.821	0.182
Total	29.15±6.13	27.35±5.22	T=2.777	0.015

Table 3. Comparison mean age of marriage adjusted with sexual function domains in two groups

Age of Marriage(y)	Groups	Mean±SD Arousal	Test	Mean±SD Lubrication	Test	Mean±SD Pain	Test	Mean±SD Total sexual function	Test
<15	COC	4.89±1.65	t=2.89*	4.21±1.64	t=1.81	4.19±1.41	t=1.60	23.60±11.14	t=2.22
	DMPA	4.42±1.16	P=0.02	4.83±1.60	P=0.02	5.03±1.55	P=0.02	30.42±2.12	P=0.02
15-18	COC	4.21±0.98	t=1.76	5.35±1.55	t=1.97	5.53±0.91	t=1.61	32.14±4.18	t=1.41
	DMPA	4.17±1.21	P=0.10	4.96±1.45	P=0.10	5.10±1.05	P=0.10	30.77±4.81	P=0.10
19-22	COC	4.59±1.42	t=2.24	5.29±1.25	t=1.90	5.47±1.35	t=2.39	31.76±4.11	t=2.17
	DMPA	4.23±1.19	P=0.04	4.33±0.92	P=0.04	4.47±1.62	P=0.04	26.99±5.61	P=0.04
>22	COC	4.68±1.28	t=0.84	4.60±0.98	t=1.86	4.78±1.65	t=2.24	27.39±6.81	t=1.99
	DMPA	4.57±1.04	P=0.52	3.88±0.84	P=0.52	4.02±1.16	P=0.52	24.29±7.11	P=0.52

*Independent t-test

Table 4. Comparison mean of menstrual status adjusted with sexual function domains in two groups

Menstrual status	Groups	Mean±SD Arousal	Test	Mean±SD Lubrication	Test	Mean±SD Pain	Test	Mean±SD Total sexual function	Test
Regular	COC	5.90±1.79	t=2.56*	4.39±2.36	t=2.65	5.19±2.22	t=2.48	26.46±6.25	t=2.57
	DMPA	3.91±1.16	P=0.01	4.28±1.63	P=0.02	4.45±1.46	P=0.01	26.81±4.82	P=0.12
Irregular	COC	3.38±2.57	t=2.73	4.21±1.86	t=2.81	4.39±1.86	t=2.57	24.92±4.91	t=2.86
	DMPA	4.71±1.41	P=0.01	5.20±0.96	P=0.01	5.34±1.38	P=0.01	32.21±4.62	P=0.01
Amenorrhea	COC	3.28±2.11	t=2.96	4.01±1.65	t=2.92	4.18±2.10	t=2.93	23.59±5.61	t=2.61
	DMPA	4.23±1.20	P=0.001	4.66±1.57	P=0.001	4.80±1.43	P=0.001	28.97±4.81	P=0.03

*Independent t-test

Lower in the DMPA group, while pain scores were higher in the DMPA group in comparison with the COC group ($P < 0.05$; Table 2). Comparison mean age of marriage and menstrual status were adjusted with respect to sexual function and its domains (Tables 3 & 4).

Discussion

The present results showed a significant difference in sexual function between the DMPA and COC groups. The results of various studies seem to be in disagreement with the present findings (4, 13, 35-37). In contrast, Sabatini et al. (2006) reported the negative effects of hormonal contraceptive methods on the sexual function of women (24). The present study was in agreement

with previous studies (22, 32, 38). This difference could be related to cultural diversities in the study populations, as well as the use of different data collection tools.

Various studies have been conducted on the relationship between sexual function and hormonal contraception in developed countries. In the present study, there was a significant difference in sexual arousal, lubrication, and pain between the DMPA and COC groups. In a study by Schaffir et al. (2010), hormonal effects on sexual function were unclear (35). Nijland et al. (2008) reported reduced estrogen level, which could lead to decreased blood supply to the vagina, reduced lubrication, and painful intercourse (39).

Oinonen and Mazmanian (2007) showed that

hormonal balance is necessary for continuing sexual function. Estradiol has major impacts on vaginal epithelial cells and lubrication (40). According to various studies, a sufficient level of estradiol is necessary for maintaining vaginal lubrication and avoiding dyspareunia, which can decrease sexual fantasies and desires (41, 42). Also, in a study by Wiebe et al. (2010), sexual function could be improved by estradiol (43).

In a study by Schaffir et al. (2010), estradiol level was shown to have no major effects on dyspareunia or vaginal lubrication in the studied women. Considering the effects of progesterone on vaginal epithelial cells in women using DMPA, estradiol level was tangibly low and could even cause estrogen suppression (35). Also, Sitruk-Ware et al. (2013) reported that most progestins used in hormonal contraceptives are chemically related to testosterone (44).

Sexual problems related to hormonal contraceptive methods might be due to different physiological responses to hormone levels. Therefore, the rate of sexual problems in some communities is lower than others (45); however, the role of testosterone in women's sexual arousal should be taken into consideration. Women who are more sensitive to testosterone changes suffer from more sexual problems (7). Among DMPA users, positive mood was lower, while negative mood was more frequent in comparison with stable COC users (46). In contrast, Davison et al. (2008) stated that COC users had significantly lower frequencies of sexual thoughts, sexual interests, and days of sexual activity per month (42).

In the present study, the difference in menstrual patterns was significant, which was in agreement with a study by Basson et al. (2010) (17). On the other hand, women using DMPA suffered from amenorrhea, which might have affected their sexual pleasure (36). In addition, Simber et al. (2007) indicated a significant decline in hyperemia in DMPA users; also, DMPA could lead to endometrial atrophy (47). In our study, the mean age at marriage was lower in women using DMPA in comparison with those using COC; this finding was consistent with the results reported by Wiebe et al. (2008) (48).

Pleasurable experiences and favorable feelings towards the partner can affect sexual satisfaction in women and can prevent sexual dysfunction in

case of reduced sexual hormones (49). In fact, sexuality, sexual desire, and arousal are majorly affected by the mental health and feelings of the sexual partner during sexual intercourse (20). Unfortunately, in this study, sexual dysfunction was not investigated in the partners.

The strength of the current study was the comparison of sexual function among COC and DMPA users. On the other hand, one shortcoming was the exclusive setting of this study (Tehran, Iran); therefore, the study sample might not reflect the general population of Iran. Other limitations of this study were the addiction of subjects or their partners to alcohol, cigarettes, or drug use, which might have been neglected due to cultural and social barriers. Also, the subjects' embarrassment in expressing their sexual issues and lack of knowledge about the spouse's sexual disorders were other limitations of this study.

Conclusion

Women using DMPA may be exposed to sexual dysfunction more than COC users. Sex hormones have a modifying effect on sexual function, although other variables such as learned responses might be influential, as well. When introducing hormonal contraceptive methods, physicians and healthcare providers should be cautious about their potential effects on sexual function, in addition to their advantages and disadvantages. It is important that women choose a contraceptive method which is not only effective, but also does not complicate their emotional and sexual lives. Further research is required to determine the best way to inform women about the potential risks and benefits of hormonal contraception.

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Conflicts of interest

The authors declare no conflicts of interest.

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