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Evaluation of Effects of Mirena on Female Sexual Function, Weight Gain, and Mood Changes

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ABSTRACT

Background: The intrauterine device (IUD) is one of the most popular contraceptive methods. Mirena is a hormonal IUD that can provide long-term birth control. The possible negative side effects of Lng-IUS on female sexuality is still a matter of debate, with conflicting results.The aim of the present study was to evaluate the effects of mirena on female sexual function, weight gain, and mood changes. **Patients and Methods:** A cross-sectional analysis study of 48 participants' women, use of an intrauterine contraceptive method, conducted to Obstetrics and Gynecology Department, Zagazig University Hospitals. All patients who enrolled in the study were subjected to full history taking, clinical examinations, and estimation of Female sexual function index and BMI. Main outcomes were estimated including desire, orgasmic function, lubrication and vulvovaginal symptoms, and sexual satisfaction and mood changes. **Results:** The age of the studied cases ranged from 22 to 40 years with mean 31.22 ± 4.67 years. There was no statistical significance difference in FSD before and after Mirena insertion among the studied group. No statistically significant difference was founded between BMI before and after 2,4 and 6 months after insertion. There was no statistical significance difference in depression before and after Mirena insertion but there was a statistical significance increase in frequency of anxiety (43.5% before versus 80.4% after), sleep disorders (6.5% before versus 41.3% after), and restlessness (4.3% before versus 58.7% after) among the studied group.**Conclusion:** The design of the study has important advantages for understanding the association between the use of mirena IUD type and quality of life, body weight and sexuality of women. It might have valuable implications for health care professionals-gynaecologists, sexologists, psychiatrists and clinical psychologists.

Keywords: Mirena IUD, BMI, Sexual Function, Anxiety

INTRODUCTION

An intrauterine device (IUD) is the most widely used reversible form of contraception, with 100 million estimated users worldwide **(1).** Hormonal contraceptives, especially Long Acting Reversible Contraceptives (LARCs) ensure safe and effective contraception, which is essential for preventing unintended pregnancies **(2).**Mirena is a hormonal IUD that can provide long-term birth control (contraception). It prevents pregnancy for up to five years after insertion. It's one of several hormonal IUDs with Food and Drug Administration approval **(3).** Mirena offers effective, long-term contraception. It can be used in premenopausal women of all ages, including teenagers **(4).** The levonorgestrel-intrauterine system, (Lng-IUS) offers excellent contraceptive efficacy and a range of non-contraceptive benefits such as a significant reduction in mean menstrual blood loss, reduced endometriosis-associated pain, and reduced fibroid associated blood loss **(3).**

The most commonly used and most studied Lng-IUS contains 52 mg levonorgestrel (Mirena®, Bayer AG). It involves a low systemic release of levonorgestrel and is therefore, on a theoretical basis, believed to be a good option for women with previously reported systemic progestogen associated side effects **(5).** In recent study to **Malmborg et al. (6**) reported the women in this study using the Lng-IUS more often report negative sexual desire effects of their contraception as well as lower sexual desire level compared with women using the Cu-IUD**.**

The aim of this study is to evaluate the effects of mirena on female sexual function, weight gain, and mood changes. Also, to assess the specific aspects of sexual functioning, such as sexual desire,

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sexual activity, orgasm frequency, satisfaction with sex life, and satisfaction of desire level of mirena users.

PATIENTS AND METHODS

A cross-sectional analysis study of participants' women, use of an intrauterine contraceptive method,conducted to Obstetrics and Gynecology Department, Zagazig University Hospitals during the period from March 2021 until September 2021.

Inclusion criteria:

The study included 46 young women aged from 18 – 40 years. In a total of participants' women, was reported current use of Mirena as intrauterine contraceptives (IUC) and was included in the present study. Ongoing intrauterine contraceptive use was the only inclusion criterion.

Exclusion criteria:

Ingestion of any hormonal treatment, pregnancy, pelvic Inflammatory Disease and genital tumors.

Methods:

All patients who enrolled in the study were subjected to the following: history taking: demographic characteristics, duration about hormonal contraceptives uses, education status, family status, obstetric history and complete clinical examination.

Female sexual function index:

Female sexual function was evaluated by using the Turkish version of the FSFI, which was verified by the Turkish Andrology Association **(Rosen et al. 2000).** The FSFI questionnaire contains 6 main domains and 19 questions. The distribution of these domains and questions is as follows: 1 – Desire (questions 1 and 2); 2 – Arousal (questions 3, 4, 5 and 6); 3 – Lubrication (questions 7, 8, 9 and 10); 4 – Orgasm (questions 11, 12 and 13); 5 – Satisfaction (questions 14, 15 and 16); and 6 – Pain (questions 17, 18 and 19). The scoring of the FSFI questionnaire was as follows: The answers to questions 1–16 were Likert-type answers and ranged from 'never' (1 point) to 'very much' (5 points). The answers to questions 17–19 were scored as 'very much' (1 point) to 'never' (5 points). The individual domain score was obtained by adding the scores of the individual items constituting the domain and multiplying the sum by the domain factor. The domain factors were 0.6 for desire, 0.3 for arousal and lubrication, and 0.4 for orgasm, pain and satisfaction. The total scale score range was between 2 and 36. Participants who had a total FSFI score less than 26.5, which was defined as the cut-off value in the literature, were considered to have FSD **Rosen et al. (7).**

BMI measurement:

BMI by calculated using the Healthy Weight Guide BMI calculator.

Questionnaire Setting

All respondents answered a three-part validated questionnaire. All questions except for height and weight were multiple choice with boxes to tick and extra space for comments on the questions about side effects."Part One" contained questions about demographic background: this part includes age, race, ethnicity, date of insertion, type of current relationship, and parity, weight, height, BMI (before and 2 months,4 months,6 months after insertion), pain level on insertion (0-10). "Part Two" contained questions about levonorgestrel-intrauterine system, (Lng-IUS) and satisfaction with that method. Here, the positive and negative side effects could be listed and details about levonorgestrel-intrauterine system, (Lng-IUS) counselling sought by the participant as well as their considerations about ending use of the method or changing to a new method. Questions about side effects are neutral, with equally adverse as well as positive effects choices."Part Three" was concerned with different aspects of sexuality, weight gain and mood changes. Questions have a short multidimensional scale for assessing sexual function in women acceding to **Rosen et al. (7),** and the McCoy Female Sexuality Questionnaire (MFSQ) **McCoy (8),** weight gain and mood changes.

Main Outcome Measure

Several aspects, including desire, orgasmic function, lubrication and vulvovaginal symptoms, and relationship and sexual satisfaction. Weight gain and body composition. Detection of mood changes as anxiety, depression, sleep disorders or restlessness after using IUD.

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Statistical analyses

Data collected and analyzed using Microsoft Excel software. Data were then imported into Statistical Package for the Social Sciences (SPSS version 20.0) software for analysis. The results was presented as frequencies and proportions in tables and text. Comparisons of differences between groups was performed using the $\chi 2$ test and, when the expected count was less than five, Fischer's exact test. In order to adjust for identified possible confounders also affecting sexual function and asked for in the questionnaire, we used binary multiple logistic regression analyses.

RESULTS

This study was a cross-sectional conducted in the outpatients and Department of Obstetrics and Gynecology at Zagazig University Hospital included 46 women using mirena as contraceptive method .The aim of this study was to evaluation the effects of mirena on female sexual function, weight gain, and mood changes. the age of the studied cases ranged from 22 to 40 years with mean 31.22 ± 4.67 years. Regarding education, 6 (13.1%) were with high school education, 29 (63%) with university education and 11 (23.9%) with post graduate education. House wife was the most common occupation (43.5%) followed by part time employee (30.4%) then full time (26.1%). Finally, 17.4% had low income, 63% moderate and 19.6% high income **(Table 1)**.

About 76.1% of the studied group had parity 2 to 3 also 23.9% had history of previous abortion. CS was more frequent in mode of last delivery (56.4%). Finally, 19.6% had history of D & C and 34.8% had history of genital infection **(Table 2)**.

There was no statistical significance difference in FSD before and after Mirena insertion among the studied group **(Table 3)**. No statistically significant difference was founded between BMI before and after 2,4 and 6 months after insertion **(Table 4)**.

There was no statistical significance difference in depression before and after Mirena insertion but there was a statistical significance increase in frequency of anxiety (43.5% before versus 80.4% after), sleep disorders (6.5% before versus 41.3% after), and restlessness (4.3% before versus 58.7% after) among the studied group **(Table 5)**. About 42 (91.3%) of the studied group were satisfied **(Figure 1)**.

Table (1): Demographic data of the studied group:

Variable		**(*n*=46)**	
Age: (year)	*Mean ± SD*	31.22±4.67	
	Range	22 - 40	
Variable		**N**	**%**
Education:	*High school*	6	13
	University	29	63
	Post graduate	11	24
Occupation:	*House wife*	20	43.5
	Part time employee	14	30.4
	Full time employee	12	26.1
Income:	*Low*	8	17.4
	Moderate	29	63
	High	9	19.6

Sd: Standard deviation

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Table (2): Gynecological history of the studied group:

Variable		(n=46)	
		N	%
Parity:	**1**	**2**	**4.3**
	2-3	**35**	**76.1**
	>3	**9**	**19.6**
Previous abortion:	**0**	**35**	**76.1**
	1	**10**	**21.7**
	2	**1**	**2.2**
Mode of previous delivery:	***NVD***	**20**	**43.4**
	CS	**26**	**56.6**
History of D & C	***No***	**37**	**80.4**
	Yes	**8**	**19.6**
History of genital infection:	***No***	**30**	**65.2**
	Yes	**16**	**34.8**

Table (3): Evaluation of female sexual functions before and after Mirena insertion among the studied group:

Variable		Before (n=46)		After (n=46)		P
		N	%	N	%	
Desire	*Inadequate*	29	63	33	71.7	0.13
	Adequate	17	37	13	28.2	NS
Arousal	*Inadequate*	35	76.1	37	80.4	0.50
	Adequate	11	23.9	9	19.6	NS
Lubrication	*Inadequate*	27	58.7	32	69.6	0.06
	Adequate	19	41.3	14	30.4	NS
Orgasm	*Inadequate*	43	93.5	43	93.5	1
	Adequate	3	6.5	3	6.5	NS
Sexual satisfaction	*Inadequate*	36	78.3	39	84.8	0.25
	Adequate	10	21.7	7	15.2	NS
Dyspareunia	*Yes*	23	50	25	54.3	0.50
	No	23	50	21	45.7	NS
Total	*Dysfunction*	33	71.7	36	78.3	0.31
	Normal	13	28.2	10	21.7	NS

P:McNemar test NS: Non significant (P>0.05)

Table (4): BMI before and after Mirena insertion among the studied group:

BMI (kg/m^2)	Before insertion	After 2 months	After 4 monthes	After 6 monthes	p
Range	21.4 – 33.80	21.89 – 34.0	22.30 – 33.70	22.20 – 34.20	
Mean ± SD.	24.59 ± 2.5	24.60 ± 2.58	24.96 ± 2.92	25.63 ± 2.96	0.922
Median (IQR)	24.5 (23.7 – 25.45)	24.80 (23.7 – 26.0)	25.10 (23.3 – 26.5)	25.4 (22.9 – 26.8)	NS

SD: Standard deviation IQR: inter quartile range F:Rpeated measure ANOVA NS: Non significant (p>0.05)

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Table (5): Evaluation of mood change before and after Mirena insertion among the studied group:

Variable	Before (*n*=46)		After (n=46)		P
	N	%	N	%	
Anxiety	20	43.5	37	80.4	**<0.001****
Depression	1	2.2	4	8.7	0.38 NS
Sleep disorders	3	6.5	19	41.3	**<0.001****
Restlessness	2	4.3	27	58.7	**<0.001****

P:McNemar test NS: Non significant (P>0.05) **: highly significant (P<0.001)

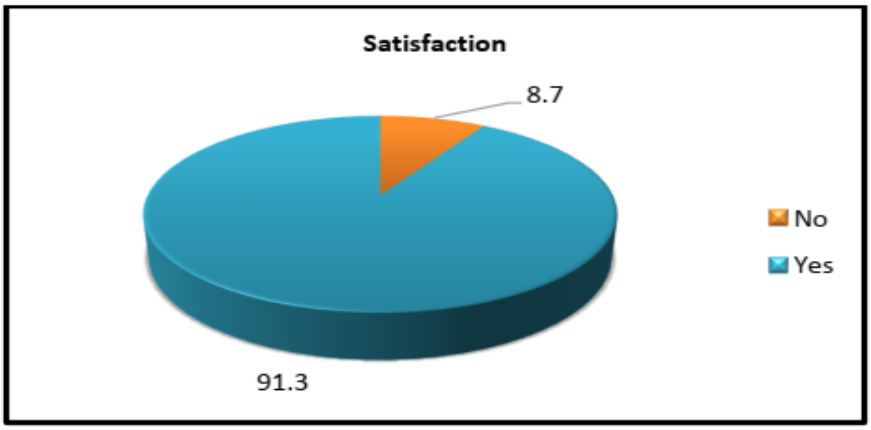

Figure (1): Satisfaction to Mirena among the studied group.

DISCUSSION:

Still, discontinuation of use of the Lng-IUS method is comparable with the discontinuation of other hormone-containing LARCs **Law et al. (9)**. It has previously been reported that Lng-IUS users havehigher discontinuation rates than women using a copper intrauterine device (Cu-IUD) **Ewies (10)**, mainly due to unscheduled bleeding but also possibly due to other progestogenic side effects **Meirik et al. (11)**.

In contrast, another study showed that sexual functioning did not differ between women using an Lng-IUS and those using a Cu-IUD, with similar levels of sexual satisfaction, sexual activity, sexual desire, and ease of attaining orgasm **Enzlin et al. (12)**. A recent study showed no difference between one year continuation rates of Lng-IUS and Cu-IUD users **Sanders et al. (13)**.

In recent study to **Malmborg et al. (6)** they reported the women in this study using the Lng-IUS more often report negative sexual desire effects of their contraception as well as lower sexual desire level compared with women using the Cu-IUD.

This study was cross section study conducted in the outpatients and Department of Obstetrics and Gynecology at Zagazig University Hospital during the period from January 2021 until september 2021. The study involved 46 women .The aim of this study was to evaluation the effects of mirena on female sexual function, weight gain, and mood changes.

In the current work, we found that the age of the studied cases ranged from 22 to 40 years with mean 31.22 ± 4.67 years. Regarding education, 6 (13.1%) were with high school education, 29 (63%)

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with university education and 11 (23.9%) with post graduate education. House wife was the most common occupation (43.5%) followed by part time employee (30.4%) then full time (26.1%). Finally, 17.4% had low income, 63% moderate and 19.6% high income. 76.1% of the studied group had parity 2 to 3 also 23.9% had history of previous abortion. CS was more frequent in mode of last delivery (56.4%). Finally, 19.6% had history of D & C and 34.8% had history of genital infection. These findings concur with those of many other authors **Abo Gharam et al. (14); Mohammed et al.(15); Maged et al. (16); Espey et al., (17) and Dijkhuizen et al. (18).**

In the present study, we found that 19.6% of the studied group had no pain during insertion, 36.9% had mild pain, 36.9% had moderate pain and 6.6% had sever pain. Mean pain score was 4±1.8 with range from 0 to 8. In agreement with our result **Abo Gharam et al. (14) and Mohammed et al. (15).** In only one of the eight trials, the Mirena IUCD insertion show moderate-to-severe pain, and increase in nulligravida **(19).**

In our work there was no statistical significance difference in FSD before and after Mirena insertion among the studied group. This in agree with our work **Martin-Loeches et al. (20)** in their prospective research, evaluating sexual desire, analysed 1073 women using IUD and OCs at the Family Planning Center 'Evaluated were also the relative risk factors in libido decrease following contraception: age, education, obstetrical history, relationship, age of sexual initiation, earlier contraception methods and the duration of current contraception method. No differences were observed in sexual desire between the group implementing IUD.

The research of other authors **Zhang et al. (21)** concerning the quality of life and sexual functioning of women (n=361) using for the first time: OCs, progestagen injections, IUDs or who underwent female sterilisation (research methods used: World Health Organization Quality of Life and Sexual Functioning) showed the highest satisfaction sexual activity and quality of life in the group of women after surgical sterilisation. No statistically significant changes in the quality of life and sexual functioning were observed in the group of women using OCs, progestagen injections and IUDs .

This in contrast to **Skrzypulec and Drosdzol (22)** study that showed the evaluation of the FSFI scale and its six collective domains (sexual desire, sexual arousal, lubrication, orgasm, sexual satisfaction and dyspareunia) showed that women from the study group (Mirena Group) display higher sexual functioning as compared with the controls. The total FSFI scores were statistically significant – revealing better sexual life in women using the Mirena intrauterine system in comparison with patients with other intrauterine devices. There was a significant differences between the groups (MG and cu-IUD) were also found in categories: sexual desire, sexual arousal, orgasm, sexual satisfaction and dyspareunia, which confirmed higher sexual functioning in women with the Mirena system.

On other hand regarding effect of mirena on body weight our study showed that no statistically significant difference was founded between BMI before and after 2,4 and 6 months after insertion. In contrast with our study **Andersson et al.(23)** showed that Mean body weight gain of 2.9 kg was observed among LNG-IUS users at 12 months, whereas the body weight of TCu380A IUD users only increased by 1.4 kg.

As regard quality of life our work showed that there was no statistical significance difference in depression before and after Mirena insertion but there was a statistical significance increase in

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frequency of anxiety (43.5% before versus 80.4% after), sleep disorders (6.5% before versus 41.3% after), and restlessness (4.3% before versus 58.7% after) among the studied group. Other research indicate an improvement in selected parameters of the quality of life and better sexual functioning of women utilising the levonorgestrel-releasing intrauterine system **(24).**

Suhonen et al. (25) compared, among others, the quality of life and sex life of 94 women aged between 18 and 25 using a levonorgestrel-releasing intrauterine system (LNG IUD) and 99 women using OCs at the moment of therapy commencement and after 12 months of its implementation. The authors demonstrated a positive effect of LNG IUD on the quality of life of the examined women, as well as a reduction of profuse and painful menstrual bleeding; they did not observe any statistically significant differences in the sexual functioning of women using LNG IUD and OCs.

CONCLUSION:

The design of the study has important advantages for understanding the association between the use of mirena IUD type and quality of life, body weight and sexuality of women. It might have valuable implications for health care professionals - gynaecologists, sexologists, psychiatrists and clinical psychologists. It has no effect on the body weight , sexual function or depression but there was increase in frequency of anxiety, sleep disorders , and restlessness .

No Conflict of interest.

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