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Evaluation of the effect of Mirena® contraceptive device in controlling abnormal uterine bleeding

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ABSTRACT

Adequate treatment of abnormal uterine bleeding is mandatory because it affects the quality of women's life adversely, as it is responsible for medical, sexual, social and psychological problems. The mode of treatment is either medical or surgical, and a lot of cases end with hysterectomy due to either failure of medical treatment or severe side effects. Mirena® contraceptive device has been tested as a form of medical treatment to control abnormal uterine bleeding. The current study was aimed to investigate the role of Mirena® contraceptive device among Iraqi women with abnormal uterine bleeding after being followed up in comparison with another mode of conventional treatment. The first group included 45 women who were treated using the IUCD Mirena® and served as a study group, whereas the second group included 45 age-matched women who were treated with medical treatment other than Mirena® IUCD and served as a control group. Al-Diwaniyah province, Iraq. The study lasted for four years; it started in January 2014 and ended in January 2018. The results of this study revealed that the control of bleeding was successful in 32 (71.1%), 42 (93.3%), 42 (93.3%) and 42 (93.3%) of patients following first, second, third and fourth year of follow up in study group compared to 23 (51.1%), 27 (60.0%), 27 (60.0%) and 27 (60.0%) of patients in the control groups. The rate of hysterectomy was significantly lower in the study group than in control group, 8.9% versus 46.7%, respectively (P<0.001). The use of Mirena® was able to reduce the rate of hysterectomy by 0.89 % (Odds ratio of 0.11; 95% confidence interval of 0.03-0.36).

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INTRODUCTION

Alteration in the frequency of menstrual cycle or its duration or the amount of bleeding or any combination of these changes is grouped under the term abnormal uterine bleeding (AUB). This complaint is so common that is seen in about 10 to 30% of women during reproductive age and is responsible for approximately one-third of women visits to gynaecological outpatient clinics (Cheong *et al.,* 2017). Adequate treatment of this AUB is mandatory because it affects the quality of women's life adversely, as it is responsible for medical, sexual, social and psychological problems (Goldstein and Lumsden, 2017). Menorrhagia during reproductive age is related to some causes such as dysfunctional uterine bleeding, organic lesions as fibroids and adenomyosis and systemic diseases including coagulopathies (Rao, 2011). Proper treatment of heavy menstruation is often difficult and expensive, and surgical intervention in the form of hysterectomy is performed in about 30% of cases. In the near past, surgical intervention has been the

gold standard approach to treat menorrhagia; however, the will of women to conserve their uterus and the overall aim of health care to reduce the cost of management directed modern gynaecology practices toward more conservative management (Dakhil, 2017).

Mirena® is an intrauterine device in which the mechanism of action is based on hormonal principle. It is considered as a long-acting contraceptive way that is reversible. Mirena® structure is composed of T-shaped body made of polyethylene (T-body) and a steroid container made of a combination of silicone and levonorgestrel (a total of 52 mg levonorgestrel around the vertical stem). Mirena® is a hormone-based IUCD considered as a long-acting reversible form of contraception. The largest quantity of the hormone remains inside the uterus, and a very small proportion is absorbed into the bloodstream (Mezher *et al.,* 2017).

This contraceptive device liberates the hormone at a rate of 20 μg per day initially then the rate of hormone release gets lower to about 14 μg per day following five years; this does clinically adequate to produce contraception (Hidalgo *et al.,* 2009; Seeber *et al.,* 2012). The device acts as a foreign body and by this way induces an inflammatory response resulting in the recruitment of inflammatory cells such as neutrophils, lymphocytes, plasma cells, and macrophages. These inflammatory events reach a peak within three months after the device has been inserted in addition to hormonal effects related to levonorgestrel component (Dakhil, 2017).

The current study was designed to investigate the role of Mirena® among Iraqi women with abnormal uterine bleeding after being followed up in comparison with other modes of conventional treatment.

PATIENTS AND METHODS

The present observational cohort study included 90 women with abnormal uterine bleeding who were followed up for four years' duration to report an outcome of a hysterectomy — women aged from 35 to 53 years. Any women with an organic cause of abnormal uterine bleeding were excluded from the study, such as a uterine fibroid, adenomyosis, endometrial carcinoma, and cervical carcinoma. Women were classified into two groups according to the mode of treatment. The first group included 45 women who were treated using the IUCD Mirena® and served as a study group, whereas the second group included 45 women who were treated with received medical treatment other than Mirena® IUCD and served as a control group. The study was conducted at the Gynecology Department, Al-Diwaniyah Maternity and Child Teaching Hospital, Al-Diwaniyah province, Iraq. The study started on January 2014 and ended in January 2018. The following information was obtained for each woman participating in the current study: age, parity, size of the uterus as determined by ultrasound examination, type of menstrual disturbance, history of the previous operation and finding of histopathological examination of the endometrial biopsy.

The study was approved by the Ethical Approval Committee (EAC) of the College of Medicine, University of Al-Qadisiyah, Iraq. Verbal consent was taken from each woman after explaining the aim and the method of the current study.

Statistical analysis

Statistical analysis was carried out using statistical package for social sciences (SPSS) version 23. Numeric variables were expressed as mean and standard deviation while categorical variables were expressed as number and percentage. Student t-test was used to compare differences in mean values between control and study groups. A p-value > 0.05 was considered as non-significant while a value of ≤ 0.05 was considered as statistically significant.

RESULTS

The study included 45 women in the study group with a mean age of 44.3±4.71 years and 45 women in the control group with a mean age of 44.27±4.69 years; there was no significant difference in mean age between the two groups (P=0.897). Also, the statistical match between the two groups was also observed regarding parity, median parity, and inter-quartile range was 6 (3) versus 6 (5) in study and control groups, respectively (P=0.959). Abnormally large uterine size of 6, 6-8 and > 8 weeks was seen in 10, 6 and three women belonging to study group and in 7, 8 and two women belonging to control group (P=0.987). There was no significant difference in some patients having menorrhagia, polymenorrhea, menometrorrhagia and dysmenorrheal between study and control groups (P=0.999); also, there was no significant difference in frequency of previous operations between the two groups (P=0.999). Histological examination showed one of the following findings: proliferative phase, proliferative phase with cystic dilation, secretory phase, and endometrial hyperplasia and there was no significant difference in the frequency of these changes between the two groups (P=0.952), as shown in table 1.

Control of bleeding was successful in 32 (71.1%), 42 (93.3%), 42 (93.3%) and 42 (93.3%) of patients following first, second, third and fourth year of follow up in study group compared to 23 (51.1%), 27 (60.0%), 27 (60.0%) and 27 (60.0%) of patients in

Table 1: Characteristics of the control and study groups

Characteristic		Study group No = 45	Control group No = 45	*P*
Age	35-39 year	8	7	0.999
	40-44 year	15	18	
	45-50 year	17	14	
	> 50 year	5	6	
	Mean age ±SD (years)	44.3±4.71	44.27±4.69	0.897
Parity	<2	5	7	0.992
	2-4"	7	6	
	5-7"	23	20	
	>7	10	12	
	Median (IQR)	6 (3)	6 (5)	0.959
Size of uterus	Normal	26	28	0.987
	Six weeks	10	7	
	6-8 weeks	6	8	
	>8 weeks	3	2	
Menstrual complaint	Menorrhagia	30	28	0.999
	Polymenorrhea	10	9	
	Menometrorrhagia	3	5	
	Dysmenorrhea	2	3	
Previous operation	Single CS	7	9	0.999
	Previous 2 or > CS	8	5	
	Tubal ligation	5	7	
	No operation	25	24	
Histological findings	Proliferative phase	3	6	0.952
	Proliferative phase with cystic dilation	7	5	
	Secretary phase	10	8	
	Endometrial hyperplasia	25	26	

Table 2: Rate of bleeding control in study and control groups during four years' duration of follow up

Control of bleeding	First year	Second year	Third year	Fourth year
Study group; no. (%)	32 (71.1)	42 (93.3)	42 (93.3)	42 (93.3)
Control group; no. (%)	23 (51.1)	27 (60.0)	27 (60.0)	27 (60.0)
p-value	0.052	<0.001	<0.001	<0.001

Table 3: Rate of hysterectomy in study and control groups

Hysterectomy	Study group	Control group	*P*	OR	95% CI
Done	4 (8.9%)	21 (46.7%)	<0.001	0.11	0.03-0.36
Avoided	41 (91.1%)	24 (53.3%)			

OR: Odds ratio; CI: 95% confidence interval.

The control groups, as shown in table 2. The rate of hysterectomy was highly significantly lower in the study group than in control group, 8.9% versus 46.7%, respectively (P<0.001). The use of Mirena® was able to reduce the rate of hysterectomy by 0.89 % (Odds ratio of 0.11; 95% confidence interval of 0.03-0.36), as shown in table 3.

DISCUSSION

The use of Mirena® in the present study was successful in controlling bleeding and menstrual irregularities in women more significantly than other conventional forms of treatments. Also, it helps to significantly reduce the rate of unnecessary hysterectomy operations in women with menstrual irregularities. Moreover, patients enrolled in the present study were followed up for a sufficient period (4 years) to judge the efficacy of using the contraceptive Mirena® in controlling abnormal uterine bleeding.

Heavy menstruation is usually disabling and expensive to manage and may profoundly affect a female quality of life both social as well as personal (Petta *et al.,* 2005). A significant number of women with menorrhagia has evidence of iron deficiency anaemia (Miller, 2014). Extensive menstrual bleeding is more or less a subjective feature, rendering the problem difficult to address (Desai,

2012). Therapeutic regimens must target the specific mode of the menstrual cycle that the patient considers to be unusual (i. e., length of cycle and bleeding quantity) (Grigorieva *et al.,* 2003). Some methods exist to treat abnormal uterine bleeding and are either medical management or surgical (Fedele *et al.,* 2001). A lot of women are unhappy using a medical form of treatment and ultimately prefer surgery to get rid of the problem (Sheng *et al.,* 2009). About 30 percent of all hysterectomies are done to relieve excessive menstruation (Dakhil, 2017). Some studies have shown that Mirena® is an effective agent in controlling abnormal uterine bleeding regarding quantity and frequency of menstruation (Cho *et al.,* 2008) and the results of the present study are similar to the results of these studies. In one study (Ozdegirmenci *et al.,* 2011), hysterectomy rate was reduced to only (5.7%) which is comparable to the rate in the study group of the current study (8.9%) (Bragheto *et al.,* 2007).

CONCLUSION

In conclusion, Mirena® contraceptive device is a safe and effective way of treating abnormal uterine bleeding and extremely helpful in avoiding un-necessary hysterectomy operation.

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