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Relation between Using Hormonal Contraceptive, Intrauterine Contraceptive Devices and Secondary Infertility in Salah Al-Deen General Hospital

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ABSTRACT

Background: As the accessibility and usage of contraception continue to rise, it becomes crucial to thoroughly investigate how contraception affects the restoration of fertility after discontinuation. **Aim of the study:** To evaluate any potential connections between the usage of hormonal contraceptives and intrauterine devices and secondary infertility. **Subjects and method:** In Salah Al-Deen General Hospital, between January 1 and June 30, 2023, cross-sectional research was conducted to enrol 100 women, a non-probability practical sampling technique was adopted, who presented after one year after intrauterine contraceptive devices removal (including hormonal and non-hormonal), removal of contraceptive implants, and stopping the use of oral contraceptive pills and contraceptive injections. **Results:** About 86% got pregnant within one year after the discontinuation of contraception. Secondary infertility and the prevalence of contraceptive complications were significantly associated (P-value = 0.042). Among those who got pregnancy, a significant positive correlation was obtained between the duration of contraception use and the time to get pregnant (P-value =0.023). **Conclusion**: The incidence of secondary infertility was 14%. There was a significant correlation between the existence of complications and the frequency of secondary infertility. The type and duration of the contraception did not significantly impact the incidence of secondary infertility but among those who got pregnant within one year, the length of contraceptive use and the time it took to become pregnant were significantly correlated.

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INTRODUCTION

The failure to become pregnant even after several unprotected attempts is referred to as infertility, sexual contact for one year with a woman under the age of 35 and for six months with a woman beyond the age of 35. The male spouse is to blame for the problem in around 30% of cases.[1] Primary or secondary infertility is possible. [2] Women who have never given birth before are said to have primary infertility. [3] The term "secondary infertility" refers to a couple's failure to conceive after experiencing a prior pregnancy. [4] The contraceptive methods are roughly categorized into two groups including hormonal and non-hormonal methods. [5] Hormonal methods include contraceptive implants, intrauterine contraceptive devices (IUCD), contraceptive injectable, and oral contraceptive pills.[6] Non-hormonal contraceptive methods include copper IUCD and silver IUCD, these devices gradually release copper in the uterus. [7] The IUCDs hold the distinction of being the most commonly utilized approach to reversible long-acting contraception globally.[8] They are categorized into non-hormonal IUCDs and hormonal IUCDs. [9, 10] Oral contraceptive pills are the commonest method of contraception among women of all ages). [11] According to their composition, oral contraceptive pills can be either combined with estrogen and progesterone or progesterone-only pills. [12]

Contraceptive injections, encompassing both combined hormonal and progestogen-only options, provide a secure and efficient method of reversible contraception. Across the globe, over 40 million women employ contraceptive injections, and in several low-resource countries, these injections constitute often half or more of modern contraceptive methods. [13] Starting from their introduction in the United States in 1991, progestin-only subdermal contraceptive implants have emerged as a secure and widely adopted choice for contraception. They offer extended-duration, remarkably efficient reversible contraception. [14] .The hormone is released steadily and slowly at a consistent pace, delivering reliable contraception for five years. [1] As the accessibility and usage of contraception continue to rise, it becomes crucial to thoroughly investigate how contraception affects the restoration of fertility after discontinuation. [15] The aim of this study is to identify potential links between the usage of hormonal contraceptives, IUCD, and the resulting secondary infertility.

MATERIAL

A cross-sectional was conducted in Gynecology and Obstetrics Department at Salah Al-Deen General Hospital during the period from the 1st of January to the 30th of June 30, 2023. In the current study, 100 women who presented one year after having their IUCDs removed (both hormonal and non-hormonal IUCDs), their

contraceptive implants removed, their usage of oral contraceptives discontinued, and their contraceptive injections discontinued, were included using a non-probability convenient sampling technique.

Inclusion criteria included women aged <35 years, women who had at least one pregnancy before the use of contraception, women who planned to get pregnant with regular unprotected intercourse, and women with partners who did not have any abnormality that could interfere with pregnancy. Exclusion criteria included women with endocrine disorders like thyroid disorder, pituitary disorders, or polycystic ovary syndrome, women with uterine or fallopian tubes like a traumatic accident or ectopic pregnancy, women with uterine diseases like uterine fibroids, polyps, and endometriosis, women who used infertility treatment after stopping the contraception, women with marked obesity, and smoker women.

Statistical analysis conducted using SPSS software (version 16.0, SPSS Inc, Chicago, Ill, USA) and descriptive statistics (crosstabs:Chi-square) were employed for data analyses. A P-value less than 0.05 was regarded as significant.

RESULTS

About two-thirds of the participants (65%) used hormonal contraception, the commonest method of hormonal contraception was OCP which constituted 76.6%. 20% of them used contraception for more than 4 years. Infection was the commonest problem of IUCD (35.5%). (Table 1). Most of the women (86%) got pregnant within one year after the discontinuation of contraception, the percentage of secondary infertility was 14% as shown in figure 1. No significant association was obtained between the percentage of secondary infertility and para (P-value=0.076 and abortion (P-value=0.791), as shown in table 2. Secondary infertility was much more common among women who experienced contraceptive difficulties, and there was a significant correlation between the existence of complications and the frequency of secondary infertility (P-value = 0.042). According to table 3, there was no correlation between secondary infertility and form of contraception (P-value=0.239), hormonal contraception (P-value=0.056), or length of usage (P-value=0.883).

Among those who got pregnancy, a significant positive correlation was obtained between the duration of contraception use and the time to get pregnant (P-value =0.023) as shown in figure (2).

Table (1): Characteristics and complications of contraception methods

Characteristics of contraception		**N (%)**
Type	Hormonal contraception	64 (64.0)
	Non-hormonal IUCD	36 (36.0)
Type of hormonal contraception	OCP	49 (76.5)
	Hormonal-IUCD	9 (14.1)
	Contraceptive implant	6 (9.4)
Family planning	Doctor	53 (53.0)
	Owen	47 (47.0)
Duration of use	1 year	19 (19.0)
	2 years	17 (17.0)
	3 years	27 (27.0)
	4 years	17 (17.0)
	>4 years	20 (20.0)
Complications Of IUCD* (N=45)	Infection	16 (35.5)
	Heavy menstrual bleeding	13 (28.8)
	Pain	7 (15.7)
	Expulsion	4 (8.8)
Complications of OCP* (N=49)	Breakthrough bleeding or spotting	2 (4.08)
	Pain	5 (10.2)
Complications of contraceptive implant* (N=6)	Irregular bleeding	2 (33.3)
	Numbness at the site of implantation	1 (16.6)

Some participants had more than one complication and others had no complications

Table (2): Association between secondary infertility and obstetrical history

Obstetrical history		**Pregnancy within one year**		**P-value**
		Yes N (%)	No N (%)	
Para	≤3	58 (90.6)	6 (9.4)	0.076
	>3	28 (77.8)	8 (22.2)	
Abortion	0	61 (87.1)	9 (12.9)	0.791

Table (3): Association between secondary infertility and characteristics of contraception

Characteristics of contraception		Pregnancy within one year		P-value
		Yes N (%)	No N (%)	
Type	Hormonal contraception	57 (89.1)	7 (10.9)	0.239
	Non-hormonal IUCD	29 (80.6)	7 (19.4)	
Hormonal contraceptive (N=64)	OCP	45 (91.8)	4 (8.2)	0.056
	Hormonal IUCD	6 (66.7)	3 (33.3)	
	Contraceptive implant	6 (100.0)	0 (0.0)	
Family planning	Doctor	43 (81.1)	10 (18.9)	0.136
	Owen	43 (91.5)	4 (8.5)	
Duration of use	1 year	17 (89.5)	2 (10.5)	0.883
	2 years	15 (88.2)	2 (11.8)	
	3 years	22 (81.5)	5 (18.5)	
	4 years	14 (82.4)	3 (17.6)	
	>4 years	18 (90.0)	2 (10.0)	
Complications	Yes	16 (72.7))	6 (10.3)	**0.042**
	No	70 (89.7)	6 (27.3)	

Abbreviations: IUCD: Intrauterine Contraceptive Devices ; OCP: Oral Contraceptive Pills

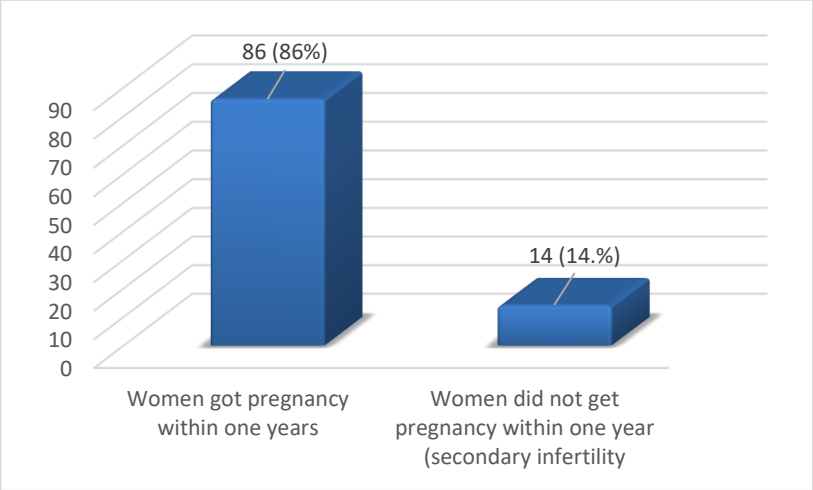

Figure (1): Percentage of pregnancy after discontinuation of contraception

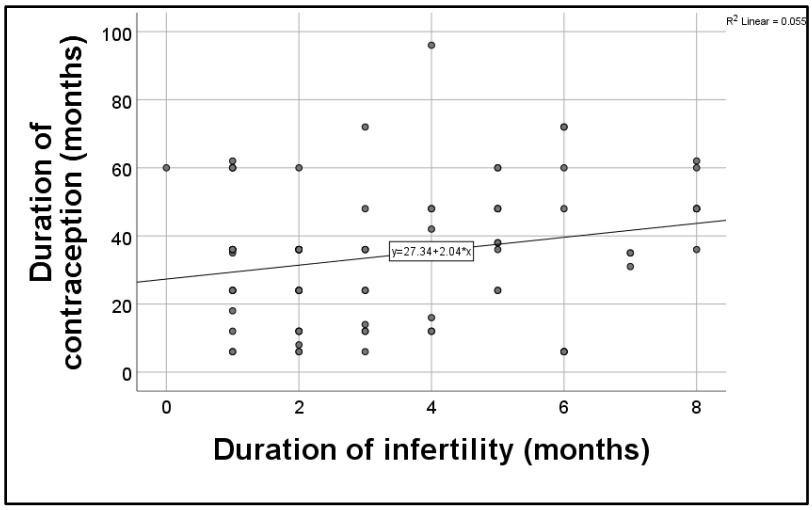

Figure (2): Correlation of duration of hormonal contraceptive use & time to get pregnant

DISCUSSION

In the current study, about two-thirds of the women used hormonal contraceptive methods, mainly OCP. In another study that was done by Quinita *et al.*, in Indonesia, more than two-thirds of women used hormonal contraceptive methods. [16] In India, about 43% of the women used OCP followed by non-hormonal IUCD (23%), contraceptive injections (20%), and hormonal IUCD (14%). [17] In Egypt, as revealed in the study that was done there by Etemad Elshereef, about 46.7 % of women used IUCD, 28.3 used contraceptive injections, 15.6 % used OCP, and 5.6 % used contraceptive implants. [18] The difference might be related to the available methods, price and economic state of the population, and the knowledge, attitude and desire of the women. The current study revealed that more than half of the contraception's were chosen and initiated According to the results of another study, more than 75% of Egyptian women and their husbands decided on the method of contraception together (19). [19] According to the results of the current study, heavy uterine bleeding, pain, and irregular bleeding were the commonest complication of IUCD. Spotting was the most common complication of the OCP and contraceptive implants. In comparison, a study conducted by Brandon *et al.*, in the United States discovered that the predominant adverse effects and complications associated with IUCDs included amenorrhea (7.36-11.59%), heavy menstrual bleeding (4.85-15.69%), and pelvic pain (11.12–14.27%). [20] In another study conducted by Jawdat *et al.*, in Iraq, approximately 50% of the women who used OCPs experienced irregular uterine bleeding, while 20% reported spotting. These effects were accompanied by

symptoms such as nausea, breast tenderness, chloasma (skin hyperpigmentation), and weight gain. [21] The present revealed that 14% of women who stop using contraception have secondary infertility. The risk of subsequent infertility was 18.7%, according to a meta-analysis conducted by Tadele Girum and Abebaw Wasie and including 14,884 women who stopped using contraception. [22] In different research conducted by Janine *et al.,* among communities in West and East Africa, secondary infertility following the cessation of contraception was observed to be between 18 to 27%(23). [23] Another research by Maureen *et al.,*, which included 59,510 women from several European countries, found that the prevalence of secondary infertility was 20.6%. [24]

The para and previous abortions were not significantly associated with the percentage of secondary infertility. In another study done by Janine *et al.,*, the same findings were found about the significance of the influence of the para on the proportion of secondary infertility following the discontinuation of contraception. [23] The current study revealed that there was no significant association between the percentage of secondary infertility and the type of contraceptive (hormonal or non-hormonal). Similar results were found in a different study carried out by Tadele Girum and Abebaw Wasie. [22] Quinita *et al.,* revealed an insignificant association between the types of contraception and the percentage of subsequent infertility after stopping contraception. [16] A significant association was obtained in the current study between the presence of complications and the incidence of secondary infertility. In agreement, Tadele Girum and Abebaw Wasie postulated that the IUCD may cause pelvic inflammatory disease leading to secondary infertility.[22] Similar results were found in another study conducted by Natalia *et al.,* [25] There was no correlation between the proportion of secondary infertility and the length of contraceptive usage in the current study. Comparatively, the same results were obtained in other studies in Indonesia, [16]
and Ghanaian. [26]

Among women who got pregnant in the first year, there was a significant positive correlation between the duration of contraception use and the time to get pregnant. The same results were obtained in another study that was done in another study that was done by Maureen *et al.,* [24] .

CONCLUSION

In conclusion, the percentage of women who had secondary infertility after discontinuation of contraception was 14%, the complications of the contraception significantly impacted the incidence of secondary infertility. There was no discernible difference in the frequency of secondary infertility depending on the kind and length of the contraceptive techniques. However, there was a substantial correlation

between the use of contraception and the time to become pregnant among individuals who were pregnant within a year. There was no correlation between the women's sociodemographic, medical, and obstetrical factors and the percentage of secondary infertility.

CONFLICT OF INTEREST

No any financial interest or any conflict of interest exists.

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