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Comparative Study Between Immediate Versus Postpuerperium Intrauterine Contraceptive Device Insertion During Caesarean Section

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Abstract

Background: An intrauterine device (IUD) is a reliable reversible method of birth control. We assessed the effectiveness and security of cesarean delivery immediate postplacental IUD implantation. A long-term, reversible method of birth control is the copper intrauterine device or IUD. Typically, copper IUDs are constructed of T-shaped plastic with certain areas exposed copper. Women had few long-term choices for safe, effective birth control prior to the development of the first IUDs. These largely relied on oral birth control pills and barrier techniques, which were only effective when taken appropriately and regularly.

Aim: The study's objective was to evaluate the effectiveness of postpuerperium IUD implantation against immediate after placental IUD insertion.

Patients and methods: At Al-Hussein University Hospital's Department of Obstetrics and Gynecology, this research was a controlled randomized clinical trial (CRCT). Between November 2021 and November 2022, the research was carried out.

Results: Between the two groups, there were no substantial variations in expulsion, perforation, hemorrhage, infection, or technique failure (pregnancy).

Conclusion: As with IUCD insertion in a pregnant woman, immediate IUCD insertion after cesarean delivery is a secure and reliable means of contraception.

Keywords: Cesarean section, Intrauterine device, IUD expulsion, Postplacental insertion

1. Introduction

A long-term, reversible method of birth control is the copper intrauterine device, or IUD. Typically, copper IUDs are constructed of T-shaped plastic with certain areas exposed copper. Women had few long-term choices for safe, effective birth control prior to the development of the first IUDs. These largely relied on oral birth control pills and barrier techniques, which were only effective when taken appropriately and regularly.¹

The stem and arms of the gold-standard copper intrauterine device (Cu-IUD) comprise 380 mm of

copper. Copper reduces sperm motility and infiltrates the endometrium with white cells, creating an unfavorable environment for implantation.²

IUDs are one of the most successful kinds of contraception now on the market, with failure rates that are comparable to those of other types of sterilization. Similar rates of pregnancy prevention are achieved with IUDs, with failure rates of 0.08%. This increases their pregnancy-prevention effectiveness to around 99%.³

Because it does not need a separate postpartum visit, IUD implantation within 10 min after placenta delivery is an interesting technique for expanding access to postpartum IUDs.⁴

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Insertion of IUCD immediately after delivery of the placenta at cesarean section is a well-known safe, efficient, inexpensive, and accessible means of postpartum contraception that does not interfere with lactation and has minimal side effects. It takes advantage of the indicated surgery, does not significantly increase the duration of the delivery procedure and obviates the need for additional cost for another procedural insertion.⁵

The best time to put an IUD after a cesarean delivery is debatable; some gynecologists prefer to do it during the procedure after the placenta is removed, while others prefer to wait until either 42 day after puerperium or six months have passed since the procedure.

Unplanned pregnancies are common in the Middle East and North Africa, affecting the health and economics of both families and governments. Unintended pregnancy is seen as having a significant risk during the postpartum period.⁶

Particularly in underdeveloped nations where women lack regular access to healthcare facilities, the IUD is regarded as a long-acting, reversible, and inexpensive contraception treatment that is particularly successful in spacing pregnancies. IUDs may be used for postpartum contraception if they are put in place right once the placenta is delivered, whether by vaginal delivery normally or surgically, or via abdominal delivery. IUD implantation is also possible within 48 h following birth.⁶

The study's objective was to contrast the effectiveness of postpuerperium IUD implantation with immediate after placental IUD insertion.

2. Patients and methods

At Al-Hussein University Hospital's Department of Obstetrics and Gynecology, this research was a controlled randomized clinical trial (CRCT). Between November 2021 and November 2022, the research was carried out. 100 women participated in the research and were randomly divided into 2 groups. Women who provided written informed permission and were recruited in the research. **Group (A):** Within 10 min of the placenta being delivered following a caesarean section, 50 women were given the Pregna IUD. **Group (B):** The Pregna® IUD was given to 50 women at the six-week postpartum appointment.

2.1. Inclusion criteria

Healthy pregnant female, elective caesarean section, gestational age at start of study 38–40 weeks, singleton pregnancy and normal findings as

evidenced by ultrasound scanning as regard pregnancy stage, uterine size, and placental location (should not be near a scar).

2.2. Exclusion criteria

Distorted uterine cavity, uterine anomalies and rupture membrane for more than 12 h.

2.3. Study procedure

Just before the patient went into the operating room (OR) for the cesarean birth, it was established that she was willing to participate in the trial and had not yet acquired any exclusionary criteria. Every cesarean delivery was carried out by a research investigator, either directly or indirectly. Per standard of care, all individuals received peri-operative antibiotics. After the placenta was delivered and it was determined that the patient had not acquired any intraoperative exclusionary circumstances, the IUDs were opened.

2.4. Follow-up

Patients were asked about any signs of problems or adverse effects at each appointment, and they had a pelvic exam, transvaginal ultrasound, and in-spectulum examination.

2.5. Follow-up was required for all patients

2.5.1. Expulsion

Both clinically and with transvaginal ultrasound, IUD removal was confirmed. The IUCD passing through the cervix was deemed to be the definition of complete ejection. If there is more than 10 mm between the IUD's vertical arm and the point where the endometrium meets the uterine cavity, partial ejection was taken into account. If ultrasound revealed that the IUD had extended into the cervical canal or had been embedded in the myometrium, the IUCD was withdrawn. At the time of the exam, we suggested IUD replacement and performed another ultrasonography. The choice was left up to the clinician's and the patient's discretion.

2.5.2. Bleeding

By questioning participants about their daily pad use, the existence of blood clots, and the length of their purperium, bleeding was evaluated.

2.5.3. Uterine perforation

Was assessed by pelvic ultrasonography or X-ray pelvis.

2.5.4. Pelvic infection

Was evaluated based on a fever, rigors, lower abdomen discomfort, soreness, and unpleasant vaginal discharge.

2.5.5. Pregnancy (failure)

Was evaluated using a pelvic ultrasound and a serum pregnancy test in suspected situations (missed period–misplaced IUD–expelled IUCD either partial or complete). When the patient requested it or when there was partial ejection, blood, or discomfort, the IUD was removed.

2.6. Data statistical analysis

With the aid of the IBM SPSS software package version 20.0, data were fed into the computer and

evaluated. IBM Corp., Armonk, New York Number and percentage were used to describe qualitative data. The normality of the dispersion was examined using the Shapiro-Wilk test. The range (minimum and maximum), mean, standard deviation, median, and inter quartile range were used to characterize quantitative data (IQR). The 5% threshold of significance was used to determine the findings' significance.

3. Results

Table 1.

These data shows that Regarding age, there was no statistically substantial variation between the two groups (Table 2).

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Table 1. Comparison of the two study groups in terms of age (years).

Age (years)	IUD inserted during caesarean (n = 50) Number (%)	IUD inserted postpuerperium (n = 50) Number (%)	P
<20	2 (4.0)	3 (6.0)	$^{MC}p = 0.585$
20–35	44 (88.0)	40 (80.0)	
>35	4 (8.0)	7 (14.0)	0.542
Min. – Max.	18.0–41.0	16.0–46.0	
Mean ± SD.	28.96 ± 5.31	28.24 ± 6.42	
Median (IQR)	29.0 (25.0–33.0)	27.50 (24.0–32.0)	

χ^2 , Chi square test; IQR, Inter quartile range; MC, Monte Carlo t: Student t-test; SD, Standard deviation.
p: P value used to compare the two examined groups.

Table 2. Comparison of the two study groups regarding obstetric history.

Obstetric history	IUD inserted during caesarean (n = 50) Number (%)	IUD inserted postpuerperium (n = 50) Number (%)	P
Gravidity			
Primi gravida	15 (30.0)	20 (40.0)	0.295
Multi gravida	35 (70.0)	30 (60.0)	
Min. – Max.	1.0–4.0	1.0–6.0	0.585
Mean ± SD.	2.04 ± 0.90	2.0 ± 1.09	
Median (IQR)	2.0 (1.0–3.0)	2.0 (1.0–3.0)	
Parity			
Multipara	50 (100.0)	50 (100.0)	–
Min.–Max.	1.0–4.0	1.0–4.0	0.566
Mean ± SD.	1.94 ± 0.87	1.86 ± 0.90	
Median (IQR)	2.0 (1.0–2.0)	2.0 (1.0–2.0)	
Abortion			
No	45 (90.0)	44 (88.0)	0.749
Yes	5 (10.0)	6 (12.0)	
Min.–Max.	0.0–1.0	0.0–2.0	0.727
Mean ± SD.	0.10 ± 0.30	0.14 ± 0.40	
Median (IQR)	0.0 (0.0–0.0)	0.0 (0.0–0.0)	
Previous C.S			
1	21 (42.0)	21 (42.0)	$^{MC}p = 1.000$
2	18 (36.0)	18 (36.0)	
3	8 (16.0)	8 (16.0)	
4	3 (6.0)	3 (6.0)	
Min. – Max.	1.0–4.0	1.0–4.0	1.000
Mean ± SD.	1.86 ± 0.90	1.86 ± 0.90	
Median (IQR)	2.0 (1.0–2.0)	2.0 (1.0–2.0)	

χ^2 , Chi square test; IQR, Inter quartile range; MC, Monte Carlo; SD, Standard deviation; U, Mann Whitney test.
p: P value used to compare the two examined groups.

obstetric history and previous caesarean sections (Table 3).

Follow-up of the complications in the 2 groups after 1 week of IUD insertion showed that there was no statistically substantial variation between the two groups as regard Bleeding, Infection, Failure, Expulsion and Perforation (Table 4).

Follow-up of the complications in the 2 groups after 6 week of IUD insertion shows that there was no statistically substantial variation between the two groups as regard Bleeding, Infection, Failure, Expulsion and Perforation (Table 5).

Follow-up of the total complications in the 2 groups after 1 week and 6 weeks of IUD insertion showed that there was no statistically substantial variation between the two groups as regard Bleeding, Infection, Failure, Expulsion and Perforation.

4. Discussion

In comparison to hormonal treatments, intra-uterine devices (IUDs) have the benefits of being independent of women's compliance and not disrupting the coagulation system or breastfeeding. IUDs are an excellent way of contraception during the postpartum period.⁷

IUD insertion during pregnancy has the benefit of being painless since it is performed under anesthesia, as opposed to painful interval implantation of IUD after cesarean. Furthermore, it was shown that patients who received their IUDs sooner than later showed more excitement. These benefits have led many gynecologists and patients to embrace and favor this technique of implantation.⁸

Hence we carried out a prospective randomized control research included 100 women to compare

Table 3. Comparison of the two study groups regarding different parameters in after 1 week.

After 1 week	IUD inserted during caesarean (n = 50) Number (%)	IUD inserted postpuerperium (n = 50) Number (%)	^{FE} p
Bleeding			
Normal	48 (96.0)	47 (94.0)	1.000
Heavy bleeding	2 (4.0)	3 (6.0)	
Infection			
No	50 (100.0)	49 (98.0)	1.000
Yes	0 (0.0)	1 (2.0)	
Failure			
No	50 (100.0)	50 (100.0)	—
Yes	0 (0.0)	0 (0.0)	
Expulsion			
No	48 (96.0)	49 (98.0)	1.000
Yes	2 (4.0)	1 (2.0)	
Perforation			
No	50 (100.0)	50 (100.0)	—
Yes	0 (0.0)	0 (0.0)	

Table 4. Comparison of the two study groups regarding different parameters in after 6 weeks.

After 6 weeks	IUD inserted during caesarean (n = 50) Number (%)	IUD inserted postpuerperium (n = 50) Number (%)	^{FE} p
Bleeding			
No	46 (92.0)	47 (94.0)	1.000
Yes	4 (8.0)	3 (6.0)	
Infection			
No	48 (96.0)	47 (94.0)	1.000
Yes	2 (4.0)	3 (6.0)	
Failure			
No	50 (100.0)	50 (100.0)	—
Yes	0 (0.0)	0 (0.0)	
Expulsion			
No	47 (94.0)	50 (100.0)	0.242
Yes	3 (6.0)	0 (0.0)	
Perforation			
No	50 (100.0)	50 (100.0)	—
Yes	0 (0.0)	0 (0.0)	

FE, Fisher Exact.

p: P value used to compare the two examined groups.

Table 5. Comparison of the two study groups regarding different parameters in total after 1 week & 6 weeks.

Total after 1 week & 6 weeks	IUD inserted during caesarean (n = 50) Number (%)	IUD inserted postpuerperium (n = 50) Number (%)	P
Bleeding			
No	44 (88.0)	44 (88.0)	1.000
Yes	6 (12.0)	6 (12.0)	
Infection			
No	48 (96.0)	47 (94.0)	FE _p = 1.000
Yes	2 (4.0)	3 (6.0)	
Failure			
No	50 (100.0)	50 (100.0)	—
Yes	0 (0.0)	0 (0.0)	
Expulsion			
No	45 (90.0)	49 (98.0)	FE _p = 0.204
Yes	5 (10.0)	1 (2.0)	
Perforation			
No	50 (100.0)	50 (100.0)	—
Yes	0 (0.0)	0 (0.0)	

FE: Fisher Exact.

p: P value used to compare the two examined groups.

the complications between women who had intracerebral IUCD and conventional insertion and to evaluate if intra-cesarean IUCD was an acceptable method as contraception. They were followed-up at 1 week and 6 weeks and the data was analyzed.

In our study, the age of participants in both groups was comparable and nearly equally distributed, the mean \pm SD age of patients in the postplacental group was 28.96 ± 5.3 years while in postpuerperium group was 28.24 ± 6.42 years. There was no substantial variation as regards age ($P = 0.542$). Similarly, we found no substantial variation between the two groups regarding gravidity, parity.

Similarly, in Bayoumi et al. At the Kasr El-Aini University Hospital, 1000 women were randomly assigned to one of the two groups in an RCT research. 500 women were randomly assigned to get a post-puerperal IUD, while the remaining 500 got a postplacental IUD. The postplacental group's patients varied in age from 20 to 45 years old (mean: 31.5 ± 4.3). The postpuerperium group's patients varied in age from 20 to 45 years old (mean: 31.3 ± 4.6), but there was no statistically substantial variation in their ages. Additionally, they observed that there was no appreciable difference in gravidity or parity between the two groups.⁶

Regarding IUD expulsion, In the present study 5 out of 50 (10%) women had expulsion of IUCD over 6 weeks period in intra-cesarean insertion (group A) and 1 out of 50 women (2%) in post-puerperium (group B), but the variation was not statistically substantial (P value = 0.204). There was no statistical significance between both arms of the study regarding expulsion along follow-up visits at 1 week and 6 weeks (P value = 1 and 0.242 respectively).

Similarly, Abdel-Ghany et al.,⁹ 200 pregnant women who wanted to utilize the copper IUD for

postpartum contraception and were recommended to have an elective cesarean birth participated in the trial. These 200 women were divided into two groups: group I, where women elected to insert the IUD during their LSCS, and group II, where women elected to do so postpuerperium (six weeks after LSCS). The results of the follow-up revealed no statistical difference between the two groups regarding the expulsion rate, with 5 cases (5%) in the post-palcental group and 2 cases (2%) in the postpuerperium group (P value = 0.248).⁹

On the contrary, in a study included 254 women, Çelen et al.,¹⁰ revealed a 12-month high ejection rate of 18% after the cesarean's postplacental insertion of the CuT380A. No loss to follow-up was recorded by the authors.

There are several factors affecting the expulsion rate of IUCD after its insertion, including the delivery mode, IUD type, and time of insertion. The experience of the operator could be an important determining factor. Moreover, the physiological and anatomical changes that occur throughout the puerperium may increase the likelihood of expulsion. Excessive contractions, uterine sub involution, and chronic cervical dilation caused by excessive lochia passage may all raise the expulsion risk.¹¹

Regarding perforation, In the current investigation, neither group in either patient had any occurrences of perforation.

In a prospective follow-up study, Caliskan et al.,¹² 8343 women's copper T-380A IUD perforation risk were studied. During the course of the trial, they discovered that 18 females had uterine perforations, for an incidence of 2.2 per 1000 insertions. In comparison to the interval insertion group, the postplacental IUD group had a lower incidence of perforation.

Also in line with our study, Elsokary *et al.*,⁸ It had two groups of patients being chosen; each group contained 60 individuals who wanted to use birth control. It was carried out at a tertiary care hospital in Egypt. There were no occurrences of perforation in either group after the postplacental IUD insertion in group I during the cesarean procedure or the interval IUD implantation in group II.

As regard vaginal bleeding, there is no discernible difference between group A and group B in the percentage of women who have excessive vaginal bleeding over 1 week and 6 weeks (4% and 8%, respectively).

In line with our research, Bayoumi *et al.*,⁶ discovered that the implantation of a postplacental IUD did not seem to enhance vaginal bleeding. Also, Abdel-Ghany *et al.*,⁹ after 1 year of follow-up reported that incidence of menorrhagia was 17% in postplacental group and 24% in postpuerperium group which was statistically insignificant.

Risk of pelvic infection after intra-cesarean insertion is low 2/50 (4%), which is also low in postpuerperal IUD as well 3/50 (6%) and shows no substantial variation between two groups.

As well our findings were supported by the research by Elsokary *et al.*,⁸ who revealed similar infection rates in postplacental and postpuerperium insertion groups. In the same line findings were obtained by Welkovic *et al.*,¹³ revealed that In the postplacental-IUD group, there were 5 cases out of 245 (3.4%) and 7 cases out of 157 women without IUD implantation (4.6%) (P value = 0.40).

Regarding pregnancy on top of IUD, there were no cases reported in the present study in either group. Also, Abdel-Ghany *et al.*,⁹ experienced no instances of impromptu pregnancies in the first year after IUD implantation. In accordance with our results Çelen *et al.*,¹⁰ out of 245 instances, there was only one pregnancy on top of an IUD that had been placed immediately post-placenta.

Furthermore, Elsokary *et al.*,⁸ reported 2 cases of pregnancy on top of IUD out of 51 cases in postplacental IUD insertion group and 4 cases out of 48 in interval group, results were insignificant.

4.1. Conclusion

Immediate IUCD insertion during cesarean section is safe and effective method of contraception as IUCD insertion in purperuim it may be better as regard patient convenience because easy insertion no pain during insertion, no delay in using contraceptive method thus less risk of unintended pregnancy and its complication.

Disclosure

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Authorship

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Conflict of Interest

The authors declared that there were no conflicts of interest.

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