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Outcome of Insertion of The Intrauterine Contraceptive Device during Cesarean Delivery

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Abstract

One of the most successful reversible birth control methods is the intrauterine contraceptive device (IUCD), a long-acting reversible contraceptive technique. The goal of this work was to investigate the outcome of insertion of IUD during cesarean section and study the possible complications. This study was a prospective observational study; this study had been done in Dekernis general hospital and Alzahraa University hospital from December 2019 to November 2020 for 60 pregnant women from 130 pregnant women desired to undergo immediate post placental insertion of IUD during CS. Median age was 28.9± 5.36 years, mean gestational age was 38.07± 0.36 weeks, 26.7% cases were P-1, 23.3% were P-2. 30% had one CS before, 18,3% had two and 5% had three. There was high significant difference regarding pain and bleeding during the follow up. Only 1.67% had cervical displacement of IUD during the first week. Only 1.67% of cases were pregnant on top of IUD at 6th months follow up with no cases of ectopic pregnancy. Complication after 1st 24 hrs of insertion, pain of CS was in all cases but severe only in 1.7% of patients and bleeding normally in all cases but severe in 1.7% of patients. But, after 6th month, dysmenorrhea was in 1.67% of patients, vaginitis in 5.0%, menorrhagia in 1.67% and intrauterine pregnancy in 1.67% of patients. By inserting an IUD at the same time as CS, women may leave the hospital with a painless, long-acting method of birth control. IUD insertion during CS decrease the rate of unwanted pregnancies and prolong the inter-pregnancy intervals. To reduce insertion-related difficulties, postpartum intrauterine contraceptive device insertion should be performed by experienced and competent practitioners.

Keywords: Cesarean section; Contraception; Intrauterine contraceptive device; Postpartum.

1. Introduction

Cesarean delivery is described as the birth of a baby via uterine and abdominal wall incisions (laparotomy) (hysterotomy). This definition excludes the removal of the baby from the abdominal cavity in situations of uterine rupture or abdominal pregnancy [1]. Intrauterine contraceptive device (IUCD) placing immediately post-placental offers women convenient, long-lasting, and effective contraception at a time in their lives when they are dealing with significant time demands, unusually

high levels of stress, and substantial disruptions in their regular routines. IUCD installation after cesarean delivery has been shown to have good levels of device retention and minimal levels of problems [1]. The best course of action is to review contraceptive plans as part of prenatal care, revisit them before the woman leaves the hospital, and put them into action three weeks after giving birth. Most women resume sexual activity six weeks after giving birth, which is the most typical time for a postpartum office visit [2].

One of the most effective reversible birth control options is the intrauterine contraceptive device (IUCD), a kind of long-acting reversible contraception. IUCDs are reportedly used by 128 million women worldwide [3].

Many nations prohibit the use of IUCDs because of worries about side effects, worries about infection and infertility, lack of technical training for clinicians, and the time and expense associated in delivering services [4].

According to World Health Organization (WHO) standards, if postpartum insertion takes place between 48 hours and 4 weeks after delivery, dangers will likely exceed benefits. Although there is no pain for the patient, quick post-placental IUCD insertion (within 10 minutes) via the hysterotomy offers a strong chance to accomplish long-term contraception. No studies have shown that using this technique to implant an IUCD increases the risk of infection or other problems [5].

The goal of this work was to investigate the outcome of the insertion of IUD during cesarean section and study the possible complications.

2. Patients and Methods

This was prospective observational research; this study had been done in Dekernis general hospital and Al-Zahraa University hospital from December 2019 to November 2020 for 130 pregnant women desired to undergo immediate post placental insertion of IUD during CS and they were screened for the following criteria.

2.1 Inclusion Criteria

Women aged ≥ 18 years, cesarean delivery and desire to insert IUCD during Cesarean delivery.

2.2 Exclusion Criteria

History of menorrhagia or severe dysmenorrhea, unexplained uterine bleeding, patients who have bleeding disorders, history of atonic postpartum hemorrhage, anemia (Hb < 9 gm/dl), chronic debilitating diseases decreasing immunity such as Diabetes mellitus, structural uterine anomaly or large uterine fibroids distorting anatomy, history of previous IUD expulsion or removal for complications, copper allergy or Wilson disease, predisposing factor to postoperative infection (e.g., rupture of the membranes more than 18 hours before admission or the Cesarean birth of a stillborn child), complications during Cesarean section, Cesarean section for placenta previa or placenta accreta, inverted T incision and extended angle.

2.3 Total 60 women fulfilled all inclusion and exclusion criteria and were included in this research. These women underwent the following

2.3.1 History taking

Including demographic data (e.g., age, residence), obstetric and gynecological history (e.g., parity), past history (e.g., history of previous operations), and the indication of the current CS.

2.3.2 Examination

Abdominal examination by inspection, palpation and auscultation.

2.3.3 Investigations

Including complete blood count (CBC) (hemoglobin level, white blood cells), CRP and abdominal ultrasonography.

2.3.4 Obtaining consent for Cesarean section (CS) & Intrauterine device insertion (IUCD) insertion

IUDs are placed using the hysterotomy after the delivery of the infant and the placenta. IUDs were placed in a standardized fashion by residents and faculty who had received a ten-minute training by the principal investigators. The IUD was positioned with arms out in the applicator and inserted through the hysterotomy to the uterine fundus. A hand was placed on the exterior of the uterine fundus to stabilize the uterus and to hold the IUD in place. The applicator was then removed through the hysterectomy and the IUD strings were directed into the cervix using a ring forceps. For the LNG-IUS the IUD strings were trimmed at the level of the thread cleft prior to deployment. The Copper IUD strings were not cut. The hysterotomy was then closed in the standard fashion.

Cesarean delivery and immediate post-placental insertion of multi-load IUCD

2.3.5 Assessment & follow-up

Patients were assessed and followed up at the following times first 24 hours after delivery, one-week post-operative, one month, and every month in the first six months postoperative.

2.3.6 The assessment was done for the following outcomes

Pain: The degree of postoperative pain was evaluated by: Normally all patients had mild pain post-CS but we can differentiate between the usual pain and this caused by IUD by: Pain scoring: This was performed using visual analogue scale, which is self-reported unidimensional measure of pain intensity. It is a continuous scale of horizontal line (10 cm in length), anchored by two verbal descriptors, which was graded from 0 to 10, with 0 value representing no pain at all, 1-3 representing mild pain, 4-6 representing moderate pain, 7-10 representing severe pain and 10 as the worst possible pain imaginable. The respondent is asked to mark the visual analogue line at the point that represents her pain intensity. Need for extra analgesics beyond a standard dose of non-steroidal anti-inflammatory drugs given to all patients postoperatively.

2.3.7 Bleeding: The amount of bleeding was assessed and classified into mild, moderate, and severe according to

A number of daily used pads, passage of blood clots and number of days till bleeding stop.

2.3.8 Infection

Patients were assessed for manifestations of infections, including fever, tach**y**cardia, tender abdomen and bad odour vaginal discharge that was assessed by CBC and CRP.

Women were asked if there were any vaginal symptoms or symptomatic discharge, or vaginal bleeding. Vaginitis and UTI were assessed if any of these symptoms appeared.

2.3.9 ower genital tract infection(vaginitis)

Vaginal discharge, itching, thick scaly white patches on the vulva, redness swelling on the vulva and labia, foul odour and may be associated with urinary tract infection (UTI) in the form of frequent or painful micturition and dysuria.

2.3.10 Expulsion of IUD:

Expulsion of IUD was assessed by 1. History. Patients self-reporting seeing IUD expelled outside. **2. Examination:** Threads not palpable in P/V. **3. Transvaginal Ultrasound:** Complete expulsion was defined when the distance between the transverse part of IUD and the upper point of the endometrium was more than 17 mm

or absent IUD. **4. Plain X Ray:** To determine the location of IUD if When there are no strings visible during an IUD (intrauterine device) check-up and ultrasound does not show an IUD in the uterine cavity.

Displacement of IUD: Any IUD that Is positioned distant from the fundus and into the lower uterine segment or cervix, or that is rotated from the standard transverse position, is referred to as a displaced IUD. This was assessed by: **History:** Women feel the rigid part of the IUD, abnormal uterine bleeding, cramps/pain in the lower abdomen, and unusual vaginal discharge. **Examination:** by P/V there is a long thread and by visualization IUD loop. **Transvaginal Ultrasound:** Displacement was defined as the distance between the transverse part z**2015). Plain x-ray:** To locate the IUD that is used when there are no strings visible during an IUD (intrauterine device) check-up and ultrasound does not show an IUD in the uterine cavity, **Assessment of Pregnancy:** Patients were assessed for pregnancy using the following: History: missed period, pregnancy test, titration of HCG and ultrasound.

Pregnancy was classified as being in situ (detection of intrauterine gestational sac) or ectopic pregnancy occurs when fetal tissue implants outside the uterus or attaches to an abnormal or scarred portion of the uterus. (Manifested with abdominal pain, bleeding, amenorrhea, adnexal mass, empty uterus, and extrauterine gestational sac. Management according to the BHCG titre either by methotrexate if lower than 500 or surgical if more than 500)

Every visit during follow-up women were asked about their menstrual cycle, any complaints such as bleeding, pain, amenorrhea, infection and satisfaction with IUD.

2.4 Ethical Considerations

The Research Ethics Committee of the Faculty of Medicine at Al-Azhar University gave its approval for this research, which was conducted in compliance with the 1964 Declaration of Helsinki and its 1964 revision's ethical precepts. Informed consent was obtained from all research subjects.

2.5 Statistical analysis

The Statistical Package for Social Science (IBM SPSS®) software for Windows version 20 was employed to collect, code, review, and input the data (IBM Corp., Armonk, NY, USA). The quantitative data with non-parametric distribution were given as median with interquartile range (IQR), whereas the qualitative data were provided as numbers and proportions, means, standard deviations, and ranges.

3. Results

Table .1 shows that the median age in the studied cases was 28.9± 5.36 years. The mean gestational age was 38.07± 0.36 weeks. The Mean BMI was 28.15±2.13 and the mean of haemoglobin was 10.2±1.12. Regarding parity, 26.7% of cases were paras 1, and 23.3% were para 2. Regarding the Number of previous CS 30% were one, 18,3% were two and 5% were three. Table .2 demonstrates that at 1st 24 h follow up 51(85.0%) of patients had moderate pain, 1st week follow-up,46 (76.7%) of patients had mild pain, at 1st month follow-up,59 (98.33%) of patients had no pain, 2nd Month follow up, 58(96.67%) of patients had no pain, 3rd Month follow up,59 (98.33%) of patients had no pain, 4th Month follow up, 5th month follow up and 6th month follow up,59 (98.33%) of patients had no pain. In Table .3, at 1st 24 h follow-up up 51(85.0%) of patients had moderate bleeding, 1st week follow-up,46 (76.7%) of patients had mild bleeding, at 1st-month follow-up,3 (5.0%) of patients had mild bleeding, 2nd Month follow up, 1(1.7%) of patients had moderate bleeding, 3rd Month follow up, 1(1.7%) of patients had mild and moderate bleeding, 4th Month

follow up 1(1.7%) of patients had mild and moderate bleeding, 5th month follow up and 6th month follow up, 1(1.7%) of patients had moderate bleeding.

Table (1): Demographic Data of the studied cases.

Parameters		Studied cases (n= 60)	
		Mean± SD	**Range**
Age (years)		28.9± 5.36	19.0-39.0
BMI (kg/m^2)		28.15±2.13	25-34.6
Hemoglobin (gm/d)		10.2±1.12	9.5-11
Gestational age (weeks)		38.07± 0.36	37.0-39.0
		Numbers	**%**
Parity	P0	25	41.7%
	P1	16	26.7%
	P2	14	23.3%
	P3	4	6.7%
	P4	1	1.7%
	Range	0-4	
	Mean± SD	2.16±0.12	
Number of previous CS	0	28	46.7%
	1	18	30.0%
	2	11	18.3%
	3	3	5.0%
	4	0	0.0%
	Range	0-4	
	Mean± SD	2.76±0.35	

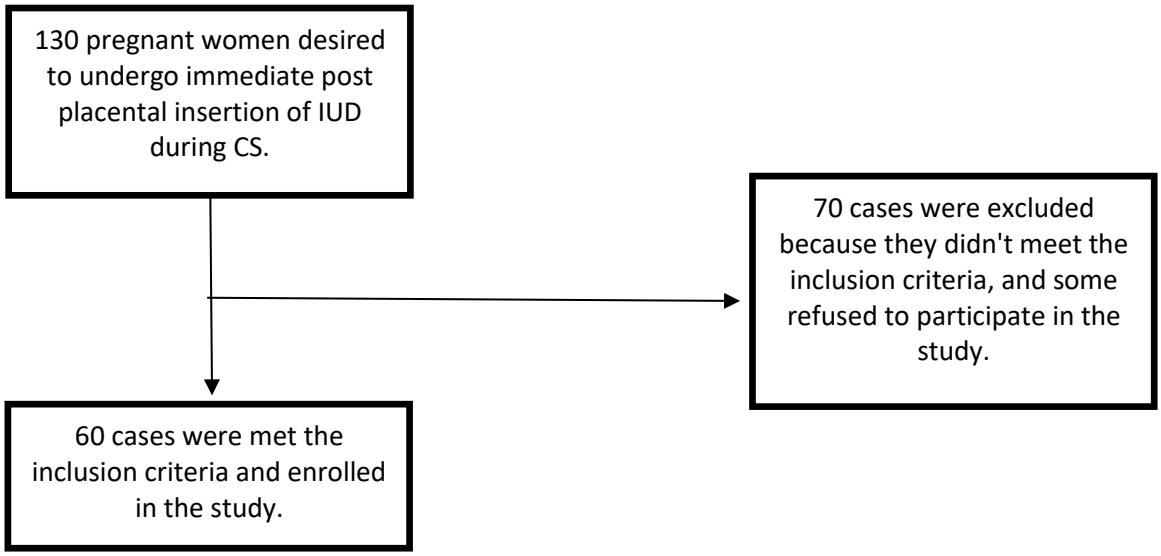

Figure (1): Flow chart of studied cases

Table (2): Incidence of pain in all stages of follow-up (1st 24h, 1st week, 1st month, 2nd month, 3rd month, 4th month, 5th month and 6th months).

Pain		Studied cases (n= 60)	
		No	%
1st 24 h Follow-up	No Pain	0	0
	Mild	8	13.3%
	Moderate	51	85.0%
	Severe	1	1.7%
1st-week Follow-up	No Pain	13	21.67%
	Mild	46	76.7%
	Moderate	1	1.7%
	Severe	0	0.0%
1st-month Follow-up	No Pain	59	98.33%
	Mild	1	1.7%
	Moderate	0	0.0%
	Severe	0	0.0%
2nd Month Follow-up	No Pain	58	96.67%
	Mild	1	1.7%
	Moderate	1(dysmenorrhea)	1.7%
	Severe	0	0.0%
3rd Month Follow-up	No Pain	59	98.33%
	Mild	0	0.0%
	Moderate	1(dysmenorrhea)	1.7%
	Severe	0	0.0%
4th Month Follow-up	No Pain	59	98.33%
	Mild	0	0.0%
	Moderate	1(dysmenorrhea)	1.7%
	Severe	0	0.0%
5thMonth Follow-up	No Pain	59	98.33%
	Mild	0	0.0%
	Moderate	1(dysmenorrhea)	1.7%
	Severe	0	0.0%
6th months Follow-up	No Pain	59	98.33%
	Mild	0	0.0%
	Moderate	1(dysmenorrhea)	1.7%
	Severe	0	0.0%

Table (3): Incidence of Vaginal bleeding in the follow-up (1st 24h, 1st week and 1st month, 2nd month, 3rd month, 4th month, 5th month and 6th month).

Bleeding		Studied cases (n= 60)	
		No	%
1st 24 h Follow-up	Mild	8	13.3%
	Moderate	51	85.0%
	Severe	1	1.7%
1st week Follow-up	Mild	46	76.7%
	Moderate	3	5.0%
	Severe	0	0.0%
1st month Follow-up	Mild	3	5.0%
	Moderate	1	1.7%
	Severe	0	0.0%
2nd Month	Mild	0	0.0%
	Moderate	1(menorrhagia)	1.7%
	Severe	0	0.0%
3rd Month	Mild	1(metrorrhagia)	1.7%
	Moderate	1(menorrhagia)	1.7%
	Severe	0	0.0%
4th Month	Mild	1(metrorrhagia)	1.7%
	Moderate	1(menorrhagia)	1.7%
	Severe	0	0.0%
5thMonth	Mild	0	0.0%
	Moderate	1(menorrhagia)	1.7%
	Severe	0	0.0%
6thMonth	Mild	0	0.0%
	Moderate	1(menorrhagia)	1.7%
	Severe	0	0.0%

Table (4): Incidence of Displacement in all stages of follow up (1st 24h, 1st week, 1st month, 2nd month, 3rd month, 4th month, 5th month and 6th months).

Displacement		Studied cases (n= 60)	
		No	%
1st 24 h	Complete (expulsion)	0	0.00%
	Cervical (>20 mm from fundus)	0	0.00%
	Perforation	0	0.00%
1st week	Expulsion	0	0.00%
	Displacement	1	1.67%
	Perforation	0	0.00%
1st month	Expulsion	0	0.00%
	Displacement	0	0.00%
	Perforation	0	0.00%
2nd Month	Expulsion	0	0.00%
	Displacement	0	0.00%
	Perforation	0	0.00%
3rd Month	Expulsion	0	0.00%
	Displacement	0	0.00%
	Perforation	0	0.00%
4th Month	Expulsion	0	0.00%
	Displacement	0	0.00%
	Perforation	0	0.00%
5thMonth	Expulsion	0	0.00%
	Displacement	0	0.00%
	Perforation	0	0.00%
6thMonth	Expulsion	0	0.00%
	Displacement	0	0.00%
	Perforation	0	0.00%

As demonstrated in Table (4), only 1.67% of cases had a cervical displacement of IUD during the first week.

Table (5): Incidence of Intrauterine pregnancy in the follow-up (2nd month, 3rd month, 4th month, 5th month and 6th months).

		Studied cases (n= 60)		Chi-square test
		No	%	
Intrauterine pregnancy	2nd Month Follow-up	0	0%	NA
	3rd Month Follow-up	0	0%	NA
	4th Month Follow-up	0	0%	NA
	5thMonth Follow-up	0	0%	NA
	6th months Follow-up	1	1.67%	NA

Table (5) indicated that only 1.67% of cases were pregnant on top of IUD at 6th month follow up which is a normal percentage even inserted postpartum.

Table (6): Incidence of ectopic pregnancy in the follow-up (2nd month, 3rd month, 4th month, 5th month and 6th month).

		Studied cases (n= 60)		Chi-square test
		No	%	
Ectopic pregnancy	2nd-month Follow-up	0	0%	NA
	3rd-month Follow-up	0	0%	NA
	4th-month Follow-up	0	0%	NA
	5th-month Follow-up	0	0%	NA
	6th-month Follow-up	0	0%	NA

No cases had ectopic pregnancy according to table (6).

Table (7): Incidence of complications at 1st 24 hrs follow up.

		No	%
Pain	No pain	0	0
	Mild	8	13.3%
	Moderate	51	85.0%
	Severe	1	1.7%
Vaginal bleeding	Mild	8	13.3%
	Moderate	51	85.0%
	Severe	1	1.7%
Displacement	Complete (expulsion)	0	0.00%
	Cervical (>20 mm from fundus)	0	0.00%
	Perforation	0	0.00%
Signs of infection	Upper gentile tract infection	0	0.00%
	Lower gentile tract infection	0	0.00%
	Wound infection	0	0.00%

Table (7) showed that Complications that occurred after 1st 24 hrs of insertion were in the form of pain of CS in all cases but severe only in 1.7% of patients and bleeding normally in all cases but severe in 1.7% of patients.

Table (8): Incidence of complications at 6th month follow-up.

		No	%
Displacement	Expulsion	0	0.00%
	Displacement	0	0.00%
	Perforation	0	0.00%
Pregnancy	Intra uterine	1	1.67%
Vaginal bleeding	Mild	0	0.0%
	Moderate	1(menorrhagia)	1.67%
	Severe	0	0.0%
Pain	No pain	59	98.33%
	Mild	0	0.0%
	Moderate	1(dysmenorrhea)	1.67%
	Severe	0	0.0%
Signs of infection	Upper gentile tract infection	0	0.00%
	Lower gentile tract infection	3(vaginitis)	5.0%

Complications occurred after 6th month of insertion was in form of dysmenorrhea in 1.67% of patients, vaginitis in 5.0%, menorrhagia in 1.67% and intra uterine pregnancy in 1.67% of patients as demonstrated in Table (8).

4. Discussion

Insertion of an Intrauterine device during the cesarean delivery may provide reversible, reliable, and non-interfering long-term contraception. Additionally, conventional insertion pain and insertion bleeding's concealment by lochia may be avoided [6]**.**

This prospective observational study included 60 pregnant women with singleton pregnancy at ≥ 37weeks of gestation who were scheduled for delivery by CS. The patients were assigned to immediate post-placental removal IUD insertion. They were recruited and assessed for eligibility from Dekernis General Hospital and Alzahraa University Hospital.

Regarding the demographic characteristics of the studied cases, these results indicated that the mean age was 28.9± 5.36 years. The mean gestational age was 38.07± 0.36 weeks. The mean BMI was 28.15±2.13 and the mean hemoglobin was 10.2±1.12. The mean parity was 2.16±0.12. The mean number of pervious CS was 2.76±0.35.

Such results were in accordance with a randomized controlled investigation by **Elsokary et al., [7]** that evaluated the efficacy of post placental IUD insertion during CS and found that the mean age of the studied cases was 29.6 ± 5.65, the mean parity was 2.37 ± 1.22 and the mean gestational age was 37.77 ± 1.40.

Additionally, these results were in accordance with a previous study by **Sultana et al. [8]** that evaluated the expulsion rate of the post-placental IUD insertion during CS and indicated that the mean age of cases was 29.75 ± 5.50 years old, the mean parity was 2.89 ± 1.42, the mean gestational age was 36.26 ± 3.07 week.

In our study, 4th Month follow-up, 5th month follow up and 6th month follow-up,59 (98.33%) of patients had no pain.

Such findings were similar to a study by **Diallo et al. [9]** that indicated that by 6 months post-placental IUD insertion during CS, only 3.7% of patients have pain.

In disagreement with these findings, a previous study by **Çelen et al. [10]** indicated an increase in pain rates in patients who had immediate post-placental IUD insertion after CS during the follow-ups as reported after 2 days, 6 weeks, 6 months and 12 months (0, 0.8, 4.1, and 8.2 respectively) that could be caused by the lack of providing drug therapy based NSAIDs.

In the study, 5th month follow-up and 6th month follow up, 1(1.7%) of patients had moderate bleeding.

Such findings were in agreement with **Shahienaz et al. [11]** study on the complications of the immediate post-placental insertion of IUD that indicated that the rates of bleeding decreased from 25% at 6 weeks follow up to 5% at 6 months follow up.

Contrarily, a previous study by **Salem et al. [12]** indicated that a heavy hemorrhage rate that was revealed within one week, six weeks and six months after immediate intrauterine contraceptive device insertion was 5.3%, 5.4% and 19.3%, respectively which was increasing with time that disagreed with this finding and this could be explained by different type of IUD.

This study demonstrated that the incidence of displacement in all stages of follow up, only1.67% of cases had cervical displacement of IUD during the first week, there were no cases with expulsed IUD or any perforation.

Such finding was similar to that with **Elsokary et al. [7]** that indicated that the rate of intrauterine displacement in immediate IUD insertion group was 1.96% and no incidence of perforation among the studied patients.

A previous study by **Azizovna and Rubenovna, [13]** also agreed with these findings and indicated that there were no instances of uterine perforation or typical inflammatory disorders (endometritis, peritonitis).

A comparative study by **Sultana et al. [8]** indicated that the expulsion rates at 3 months were 10.9 percent for IUDs inserted following Cesarean deliveries and 16.4 percent for IUDs inserted after vaginal deliveries, such findings were in contrary with these results.

Such findings were in agreement with **Shahienaz et al. [11]** study on the complications of the immediate post-placental insertion of IUD that indicated that complications within 6 months post immediate insertion of IUD during CS included pregnancy in 2% of patients.

Our results were also in accordance with previous research by **Elsokary et al. [7]** that indicated that the pregnancy rates on top of IUDs after 6 months follow up was 1.96%.

Additionally, previous research by **Çelen et al. [10]** conducted similar research and found that only one case of pregnancy on top of IUD inserted immediate post-placental out of 245 cases.

Contrarily, a previous study by **Salem et al. [12]** indicated no pregnancy 6 months after immediate intrauterine contraceptive device insertion.

Such findings were also in agreement with **Shahienaz et al. [11]** study on the complications of the immediate Post-placental Insertion of IUD that indicated that after six months, there were difficulties in the form of expulsion in 4% of patients, hemorrhage in 5% of patients, PID in 4% of patients, and gestation in 2% of patients.

A prospective study by **Mukka and Madhavi, [14]** indicated that following immediate IUD implantation during CS, 38.69% of patients had missing strings, 12.5% experienced menstrual irregularities, 4.76% experienced stomach discomfort, and 4.1% experienced spontaneous expulsion.

Our study has limitations such as this study is single-center study with a relatively small sample size, we did not include a control group, therefore, further multicenter studies are needed with larger cohort.

5. Conclusion

Intrauterine device insertion at the time of CS guarantees that women leave the hospital with an efficient method of long-acting birth control without further discomfort or expense. Intrauterine device insertion during CS decreases the rate of unwanted pregnancies and prolongs the inter-pregnancy intervals. To reduce insertion-related difficulties, postpartum intrauterine contraceptive device insertion should be performed by experienced and competent practitioners.

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