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# Effectiveness of Intrauterine Contraceptive Device in Immediate Post-Partum Period

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## ABSTRACT

***Objective:*** To determine the effectiveness of intra-Uterine Contraceptive Device in immediate postpartum period for prevention of pregnancy.

***Study Design:*** Quasi-experimental study.

***Place and Duration of Study:*** Department of Obstetrics and Gynecology, POF Hospital Wah Cantt, Pakistan, from Jan to Jun 2021.

***Methodology:*** A total of 100 women, aged 20-40 years, and parity 1-4 undergoing delivery either through normal vaginal (Group-A) or Cesarean section (Group-B) who accepted Long-Acting Reversible Contraceptives in postpartum period were included. IUCDs were placed within 48 hours of delivery. The females were followed up after first menstruation up to 3 to 6 weeks on the phone and were recalled in OPD for assessment. The primary outcome was frequency of expulsion of IUCDs and secondary outcome was pregnancy.

***Results:*** Out of the 56 patients in Group-A, 54(96.4%) didn't become pregnant. Only 2(3.6%) patients had positive pregnancy test. Forty out of forty-four subjects in Group-B (90.90%) did not develop pregnancy, which shows that IUCD (Cu-T) is an effective means of contraception (*p* value <0.001). LARC effectiveness was analogous in both study groups with *p*-value 0.232. Similarly, the frequency of expulsion was also comparable in both groups that is 11(25.0%) expulsions in Group-B versus 16(28.6%) in Group-A (*p*-value 0.433).

***Conclusion:*** The Intrauterine Contraceptive Device (Cu-T) is effective means of contraception in immediate postpartum period and can be used to decrease the expulsion rate in these women.

**Keywords:** Contraceptives, Intrauterine Device Expulsion, Long-acting reversible contraceptives, Post-Partum Period.

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## INTRODUCTION

Appropriate utilization of family planning can circumvent up to one-third of maternal and ten percent of child deaths, especially if pregnancies are spaced apart by more than two years.[1]Pakistan has a high fertility rate of 3.8 children per woman attributable to low prevalence of contraception (35%) and lack access to contraception (65%).[2,3]

The most successful approach to reducing the occurrence short-spaced pregnancies is to promote long-acting reversible contraceptives (LARC) that are extremely effective together with specialized counseling programmers.[4] Brief-interval pregnancies carry a higher risk of poor results for both the mother and the child's health.[5] Cu-T is a type of LARC which is available in market for birth control nowadays. Compared to women who use no birth control or barrier techniques, women using LARC are four times more likely to reach ideal birth interval.[6] Studies also found that no expulsion occurred in 91.0% cases while none of the study subjects attained pregnancy with LARC placed in postpartum period.[7,8] Due to a lack of local evidence, we aimed to study efficacy and reliability of LARC in our setup.

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## METHODOLOGY

The Quasi-experimental study was carried out in labor room of the Department of Obstetrics & Gynecology, POF Hospital Wah Cantt, Pakistan, after permission of Institutional Ethical Review Committee (IERB:#1114-4-POFH/ERC) from January to June 2021. One hundred patients fulfilling the selection standards were included in this study after calculating sample size with WHO sample size calculator. Sample size was calculated taking expected percentage of no expulsion (P1) to be 3.8% with LARC in postpartum period and expulsion to be 14.8% (P2).[9]

**Inclusion Criteria:** Patients of age 20-40 years, parity 1-4, presenting at gestational age >36weeks (according to last menstrual period) undergoing normal vaginal or Cesarean delivery who accepted LARC in postpartum period were included.

**Exclusion Criteria:** Females not giving consent for placement of LARC, patients opting for bilateral tubal

ligation, patients with congenital uterine anomalies, patients with placenta previa, breast feeding mothers, patients with morbidly adherent placenta, fibroid uterus, or endometriosis were excluded.

The study sample was collective through non-probability consecutive sampling technique, after informed consent was taken. Patients were divided into two groups by sealed envelope technique. In Group-B (44 patients) LARC was placed within 48 hours of Cesarean delivery. In Group-A (56 patients) LARC (Cu-T) was placed within 48 hours of normal vaginal delivery (Figure). Both Group-B and Group-A females were contacted on phone and were called for assessment of LARC after first menstruation. They were followed-up for a period of 6 months after placement of the Cu-T. No expulsion was labeled if LARC remained in its original position after 6 months of placement confirmed by abdominal ultrasound. No pregnancy was labeled if female did not conceive confirmed by abdominal ultrasound and urine pregnancy test after 6 months of placement. The primary outcome was effectiveness of LARC measured by absence of pregnancy and secondary outcome was frequency of expulsion.

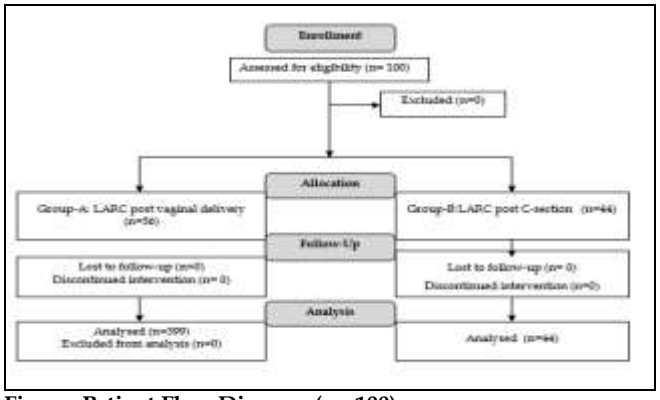


**Figure: Patient Flow Diagram (n= 100)**

The data was entered and analyzed through Statistical Package for Social Sciences (SPSS) version 26. Demographic details including name, age, gestational age, parity, BMI were noted for all patients. Mean±Sd Deviation (SD) were calculated for quantitative variables. Frequency and percentage were calculated for discrete variables. Chi-square analysis was used to draw comparisons and $p$ value ≤ 0.05 was considered as statistically indicative.

## RESULTS

There were 56 patients in Group-A and IUCD (Cu-T) was effective means of contraception as 54(96.4%) patients in Group-B didn't develop pregnancy. Only 2(3.6%) patients had positive pregnancy test. There were 44 patients in Group-B and 40(90.90%) didn't develop pregnancy. Only 4(9.1%) patients develop pregnancy which showed that IUCD (Cu-T) was an effective means of contraception. The LRC effectiveness was analogous in both study groups with p value 0.232. Similarly, the frequency of expulsion was also comparable in both groups as there were 11(25.0%) expulsions in Group-B and 16(28.6%) expulsions in Group-A ($p$-value 0.433) as shown in Table-I. Age range in both study groups was from 20 to 40 years with mean age of 30.12±4.56 years. Majority of the patients 60 (60.0%) were between 20 to 30 years of age. Mean gestational age was 38.36±1.38 weeks. There were 19(19%) females of parity 1-2 and 81(81%) females had parity 3-4. Mean BMI was 28.75±2.76 kg/m2 (Table-II).

Data was stratified for effect modifiers and found that in females aged 18-30 years, expulsion occurred in 17 cases while in 10 cases of age 31-40 years ($p$>0.05). No significant effect of parity was observed for expulsion; however, obese females showed more expulsion ($p$<0.05). Gestational age and BMI also didn't show significant correlation to rate of expulsion or pregnancy (Table-III).

**Table-I: Distribution of Demographics across Groups (n=100)**

| Parameters | | GROUP-A (n=44) MEAN±SD | GROUP-B (n=56) MEAN±SD |
|---|---|---|---|
| Age (years) | | 30.20±4.522 | 30.05±4.437 |
| Body mass index (BMI) | | 29.09±2.640 | 28.48±2.841 |
| Gestational Age (weeks) | | 38.16±1.478 | 38.52±1.293 |
| | | Frequency (%) | Frequency (%) |
| Parity | 2 | 10(17.90) | 9(20.50) |
| | 3 | 26(46.40) | 23(52.30 |
| | 4 | 19(33.90) | 12(27.30) |
| | 5 | 1(1.80) | - |

**Table-II: Effectiveness of Copper-T in Immediate Postpartum Period across Groups (n=100)**

| | | Group-A Frequency (%) | Group-B Frequency (%) | $p$ value |
|---|---|---|---|---|
| Expulsion | Yes | 16(28.60) | 11(25.0) | 0.433 |
| | No | 40 (71.4) | 33(75.0) | |
| Pregnancy | Yes | 2(3.6) | 4(9.1) | 0.232 |
| | No | 54(96.4) | 40(90.9) | |

**Table-III: Association of Effectiveness of Intrauterine Contraceptive Device with Different Parameters (n=100)**

| | | Expulsion | | *p*-value | Pregnancy | | p-Value |
|---|---|---|---|---|---|---|---|
| | | Yes | No | | Yes | No | |
| Age (years) | 18-30 | 17(27.9) | 44(72.1) | 0.713 | 4(6.6) | 57(93.4) | 0.606 |
| | 31-40 | 10(25.6) | 29(74.4) | | 2(5.10 | 37(94.9) | |
| Gestational age (weeks) | 37-39 | 22(29.30 | 54(70.70) | 0.435 | 5(6.7) | 71(93.3) | 0.664 |
| | 40-41 | 5(20.0) | 19(80.0) | | 1(4.0) | 23(96.0) | |
| Parity | Para 1-2 | 7(35.0) | 13(65.0) | 0.617 | 0(0) | 20(100) | 0.221 |
| | Para 3-4 | 20(25.0) | 60(75.0) | | 6(7.50) | 74(92.5) | |
| BMI (kg/m2) | ≤30 | 10(19.20) | 42(80.80 | 0.019 | 4(7.7) | 48(92.3) | 0.287 |
| | >30 | 17(36.2) | 30(63.8) | | 2(4.3) | 45(95.70 | |

## DISCUSSION

Despite the fact our study supports IUD insertion in the postpartum period; there are still several obstacles to this practice, including failure to show up for postpartum follow-up appointments, a lack of access to IUDs, provider ignorance, and unintentional early pregnancy. Because women are more motivated to use contraception and counseling services are more readily available at this time, some of these barriers can be removed with immediate postpartum insertion.[3] This study was done to see how effective long-acting reversible contraceptives were at preventing pregnancy and expulsion during the first few weeks after giving birth.

In this study, cumulative frequency of expulsions and pregnancy in both groups was 27.0% and 6.0% respectively. One study found that no expulsion occurred in 91.0% cases while no one attained pregnancy with LARC placed in postpartum period.[4] But another study found that expulsion of LARC occurred in 25% cases while 75% had no expulsion, and pregnancy occurred in 7.6% females while 92.4% did not attained pregnancy.[5]

Four trials confirmed the effectiveness and safety of inserting an IUD between 10 minutes and 48 hours after delivery of the placenta, within the first week postpartum, and at intervals of 4-6 weeks. When the insertion took place in early as well as in immediate postpartum periods, expulsion rates were at their highest. Infections, uterine perforations, and unintended pregnancy all had low complication rates and showed no discernible difference between groups. [6] In two of the four trials, the three postpartum times of insertion were evaluated, and it was discovered that the expulsion rate was statistically significantly higher during the early and immediate postpartum periods compared to interval insertion. Only two time periods, immediate postpartum and the interim period were studied in a randomized trial. [7]

In all the included studies, vaginal births were found to have greater ejection rates. Nevertheless, in our study the expulsion was equivalent in both vaginal deliveries and lower segment C-sections (16 versus 11). The rapid implantation of an IUD is safe and effective whether the baby was born by caesarean section or vaginally, according to the findings of six prospective observational studies on the topic. The effectiveness and viability of post-partum IUD insertion were evaluated by different studies. [8,9]All randomized controlled studies involving the insertion of an IUD immediately post-partum (within 10 min of placental delivery) were examined in that review and IUD insertion right after childbirth proved to be secure and efficient. Contrary to our findings, expulsion rates seemed to be higher in post-partum than with interval insertion. In a similar study, systematic evaluation of the insertion of intrauterine devices during the postpartum period concluded that immediate IUD implantation was safe compared to interval and later postpartum times. When compared to delayed postpartum insertion, immediate postpartum IUD implantation had lower expulsion rates, but it had greater rates than interval insertion. [10,11]

In nations like China and India, it is typical procedure to place an IUD just after giving birth. Two significant multicenter investigations, one with 300 women and the other with 2733 women, revealed expulsion rates that were lower than anticipated compared to the other studies in the review. However, the rates of complications like infection, perforations, and unintended pregnancy were similar in these studies from China and India.[12-14] Expulsion rates following vaginal delivery have also been found to be substantially greater than those following caesarean section.15 A more extensive study that included numerous follow-up examinations and considered individuals who were lost to follow-up revealed

expulsion rates that were more accurate representations of the literature at the time.[16]

A comprehensive study comparing the outcomes of participants who received the contraceptive method of their choosing at no cost, including both short-acting and LARC methods, was conducted in a high-income area with approximately 7500 women. After LARC, the population's unwanted pregnancy rate was 0.27 per 100 participant-years, compared to 4.55 for women using pills, patches, or rings.[17]

LARC, even when used in adolescent populations, is a more effective means of contraception than short-acting techniques.[11] These techniques are secure, efficient, and can lessen unmet postpartum need for contraception, according to a review of immediate postpartum LARC supply in high-income settings.[12-17] According to a review from the United States, IUDs placed at the time of both vaginal and caesarean deliveries are more likely to be in place six to twelve months after delivery than those implanted during the postpartum visit four to six weeks later. They also discovered that women who used LARC in the immediate postpartum period had longer intervals between pregnancies, and they advise adopting these techniques regardless of their effect on nursing.[18]

## CONCLUSION

We concluded that copper-T was effective means of contraception in immediate postpartum period and can be used to decrease the expulsion rate in these women.

**Conflict of Interest:** None.

**Authors Contribution**

Following authors have made substantial contributions to the manuscript as under:

SF & MA: Conception, study design, drafting the manuscript, approval of the final version to be published.

KM & MMN: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

KA & UK: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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