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Outcome of Immediate Postpartum Intrauterine Contraceptive Device in Caesarean Versus Vaginal Insertion: A Comparative Study

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ABSTRACT

Objective: To compare the outcome of immediate postpartum intrauterine contraceptive device in caesarean versus vaginal insertion.

Study Design: Quasi experimental study.

Place and Duration of Study: Department of Obstetrics and Gynecology, Avicenna hospital, Lahore Pakistan, from Oct 2024 to Mar 2025.

Methodology: After meeting selection criteria 250 females were enrolled and were divided in two groups of 125 each. Group-A were those females, who had vaginal delivery. Group-B was those females, who had cesarean section. Females were counseled about post-partum intra uterine contraceptive device (PPIUCD), and a CuT-80A was placed intrauterine. Outcome of PPIUD was noted in both groups.

Results: In this study the mean age of the participants was 29.64±6.51 years, among them, 56(22.4%) were nulliparous. After insertion of PPIUCD, Menstrual irregularities were observed in 40(32.0%) of those with vaginal delivery and 37(29.6%) of those with C-section delivery (p=0.681). Menorrhagia was reported in 40(32.0%) females with vaginal delivery compared to 11(8.8%) with C-section delivery (p<0.001). Fever occurred in 21(16.8%) vaginal delivery cases and 36(28.8%) C-section cases (p<0.001).

Conclusion: Based on this study, we may conclude that there were no statistically significant differences in the outcomes of immediate post-partum intra uterine contraceptive device (PPIUCD) insertion between caesarean and vaginal deliveries, except for the occurrence of menorrhagia and fever.

Keywords: Cesarian Section, Postpartum Intrauterine Contraceptive Device, Vaginal Delivery.

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INTRODUCTION

A new method of contraception called the Immediate Postpartum Intrauterine Contraceptive Device combines Maternal - Child health and family planning services.[1] After placental delivery, immediate intra-caesarean IUD placement offers an effective and adjustable long-term method of birth control that doesn't interfere with lactation.[1,2] In the first year following childbirth, 65% of women in India had unmet family planning requirements.[3,4]

In the first year after giving birth, just 26 percent of women utilize any kind of family planning.[5] With failure rates comparable to those of other sterilization methods, intrauterine devices (IUDs) are among the most effective types of contraception now on the market. IUDs provide a number of benefits, including as efficacy, ease of use, reversibility, and patient satisfaction, especially when taking into account the time and cost commitment needed for long-term use.[6] The two types of IUD used commonly, the copper-containing IUD and the levonorgestrel-containing IUD, have similar rates of preventing conception, with failure rates of 0.08% and 0.02%, respectively. These gadgets are therefore more than 99% successful in preventing conception.[7,8]

In routine, it has been observed that Literature is evident that there is no difference in the effectivity and complications whether IUCD will be placed after vaginal delivery or after cesarean section in immediate postpartum period. It is safe for both types of females. But still in routine, the use of PPIUCD is very low in local population. The purpose of this study is to compare the results of vaginal vs caesarean placement of an immediate postoperative intrauterine contraceptive device.

METHODOLOGY

This quasi-experimental trial was done at Department of Obstetrics and Gynecology, Avicenna Medical College and Hospital Lahore for 06 months

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(Oct 2024 to March2025) with approval of Ethical Review Board (IRB-59/12/24-AVC dated 28 Nov 2024).

Inclusion Criteria: Females aged between 18-40 years, have parity <5 and presenting for delivery at term i.e. gestational age >37 weeks were included.

Exclusion Criteria: Those with hemoglobin <8gm/dl, hypotension or hypertension, deranged coagulation profile, urinary tract infection, maternal history of asthma or cardiac disease or cerebral disease, women with fever or clinical signs of infection during birth, rupture of membranes for more than eighteen hours, and postpartum hemorrhage (bleeding more than 500 milliliters after vaginal delivery or more than 1000 milliliters after caesarean cut) were excluded.

Sample size was calculated using WHO calculator, keeping removal rate of IUCDs as 11.67% with C-section group as compared to 3.33% with vaginal group.[9] This came to 250, after which respon dents were divided into two groups of 125 each: those who had vaginal delivery were in Group-A, and those who had cesarean section were in Group-B (Figure-1). Data collection was done using non-probability consecutive sampling, after obtaining informed consent.

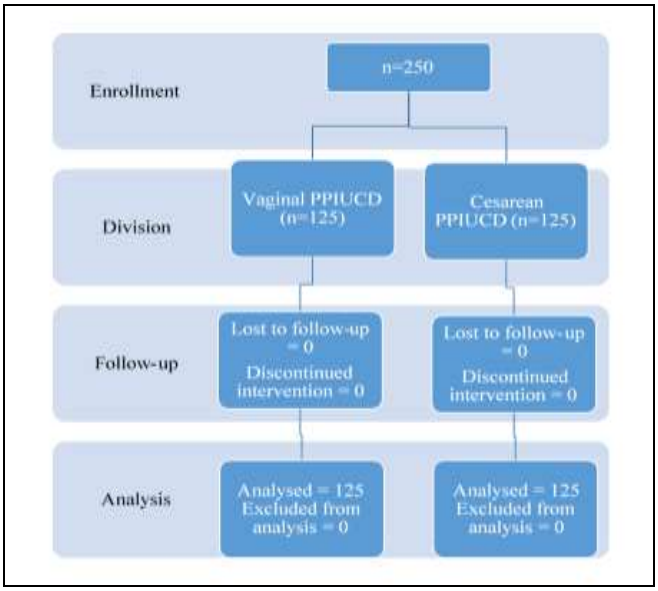

Figure-1: Patient Flow Diagram

Menstrual irregularities were labeled if menstrual cycle of female was disturbed i.e. more or less frequent. If quantity of blood loss was more than normal, it was labelled menorrhagia. If female had body temperature >99°C for >3 days at least during follow-up, she was labelled febrile. Vaginal discharge was labeled if unusual vaginal discharge was noted and reported by the respondent. Expulsion was labeled if PPIUCD was expelled during the follow up period. Removal of PPIUCD was done if needed due to complications.

Demographic details including name, age, BMI, gestational age at delivery, parity, number of previous cesarean sections, history of abortions, occupation, residence, socioeconomic status, induction of labor, and mode of delivery were noted.

Females were counseled about PPIUCD and PPIUCD was placed intrauterine CuT-80A. After ten minutes after placenta removal, Kelly's Placental Forceps were used to insert IUCD into the uterine fundus in females delivering vaginally. IUCD was inserted straight into the uterine fundus in patients who had C-sections. Every participant was monitored for six months in the OPD. During follow-up, females were examined for outcome including menstrual irregularities, menorrhagia, fever, vaginal discharge, expulsion, missing string, perforation, and need for removal. All this information was noted in proforma.

Collected data was entered and analyzed using Statistical Package for Social Sciences (SPSS) version 25. Numeric variables like age, BMI, gestational age were presented as Mean±SD while categorical variables like menstrual irregularities, menorrhagia, fever, vaginal discharge, expulsion, missing string, perforation, and need for removal were presented as frequencies and percentages. Chi-square test was used to find the association of adverse outcomes with type of PPIUCD. A *p*-value less than 0.05 was considered significant.

RESULTS

In this study, a total of 250 females were enrolled. The mean age of the participants was 29.64±6.51 years, with a mean BMI of 25.54±3.61 kg/m² and a mean gestational age of 39.90±1.36 weeks. Among them, 56(22.4%) were primiparous, while 156(77.6%) were multiparous. Previous vaginal deliveries included one delivery in 70(28%) females and two deliveries in 25(10%) females. A history of one abortion was reported in 13(5.2%) females, and two abortions in 6(2.4%) females. Homemakers accounted for 124(49.6%) of the participants. Additionally, 38(15.2%) females were from rural areas. Socioeconomic classification showed that 89(35.6%) belonged to the low socioeconomic group, 89(35.6%) to the middle group, and 72(28.8%) to the high socioeconomic group. Induction of labor was observed in 114(45.6%) participants (Table-I).

Table-I: Descriptive statistics of demographic and clinical parameters of the respondents (n=250)

Parameters		Mean±SD
Age (Years)		29.64±6.51
BMI (Kg/m²)		25.54±3.61
Gestational Age (weeks)		39.90±1.36
		n(%)
Parity	Null	56(22.4%)
	One	70(28.0%)
	Two	77(30.8%)
	Three	47(18.8%)
Number of vaginal deliveries	None	154(61.6%)
	One	71(28.4%)
	Two	25(10.0%)
Number of previous C-section	None	98(39.2%)
	One	75(30.0%)
	Two	62(24.8%)
	Three	15(6.0%)
Number of abortions	None	231(92.5%)
	One	13(5.2%)
	Two	6(2.4%)
Occupation	Housewife	124(49.6%)
	Business	74(29.6%)
	Job	45(18.0%)
	Maid/servant	7(2.8%)
Residence	Rural	38(15.2%)
	Urban	89(35.6%)
	Semi-urban	75(30.0%)
	Industrial area	48(19.2%)
Socioeconomic status	Low	89(35.6%)
	Middle	89(35.6%)
	High	72(28.8%)
Induction of labor	Yes	114(45.6%)
	No	136(54.4%)

Among the 250 females, the most common outcome of postpartum intrauterine device (PPIUD) usage was menstrual irregularities, observed in 30.8% of participants. This was followed by fever in 22.8%, menorrhagia in 20.4%, vaginal discharge in 15.2%, missing string in 8.8%, expulsion in 8%, removal in 7.2%, and perforation in 3.6% of females (Figure-2).

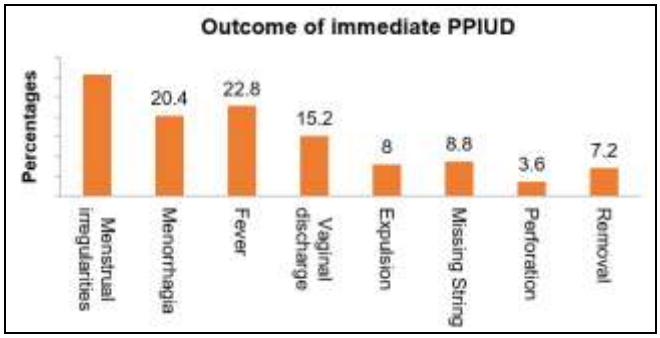

Figure-2: Outcomes observed after Immediate Postpartum Intrauterine Contraceptive Device (n=250)

Regarding the outcomes of immediate PPIUD in females, menstrual irregularities were observed in 40(32.0%) of those with vaginal delivery and 37(29.6%) of those with C-section delivery (p=0.681). Menorrhagia was reported in 40(32.0%) females with vaginal delivery compared to 11(8.8%) with C-section delivery (p<0.001). Fever occurred in 21(16.8%) vaginal delivery cases and 36(28.8%) C-section cases (p<0.001). Vaginal discharge was noted in 16(12.8%) females with vaginal delivery and 22(17.6%) with C-section delivery (p=0.291). Expulsion occurred in 14(11.2%) vaginal delivery cases and 6(4.8%) C-section cases (p=0.062). Missing strings were identified in 8(6.4%) vaginal delivery cases and 14(11.2%) C-section cases (p=0.180). Finally, removal was recorded in 7(5.6%) vaginal delivery cases and 11(8.8%) C-section cases (p=0.328), as seen in Table-II.

Table-II: Association of Adverse Outcome of Immediate Postpartum Intrauterine Contraceptive Device between Mode of Delivery (n=250)

		Mode of Delivery		Total	*p*-value
		Group-A n=125 n(%)	Group-B n=125 n(%)		
Menstrual irregularities:	Yes	40(32.0%)	37(29.6%)	77(30.8%)	0.681
	No	85(68.0%)	88(70.4%)	173(69.2%)	
Menorrhagia	Yes	40(32.0%)	11(8.8%)	51(20.4%)	<0.001
	No	85(68.0%)	114(91.2%)	199(79.6%)	
Fever	Yes	21(16.8%)	36(28.8%)	57(22.8%)	0.024
	No	104(83.2%)	89(71.2%)	193(77.2%)	
Vaginal Discharge	Yes	16(12.8%)	22(17.6%)	38(15.2%)	0.291
	No	109(87.2%)	103(82.4%)	212(84.8%)	
Expulsion	Yes	14(11.2%)	6(4.8%)	20(8.0%)	0.062
	No	111(88.8%)	119(95.2%)	230(92.0%)	
Missing String	Yes	8(6.4%)	14(11.2%)	22(8.8%)	0.180
	No	117(93.6%)	111(88.8%)	228(91.2%)	
Perforation	Yes	4(3.2%)	5(4.0%)	9(3.6%)	>0.999
	No	121(96.8%)	120(96.0%)	241(96.4%)	
Removal	Yes	7(5.6%)	11(8.8%)	18(7.2%)	0.328
	No	118(94.4%)	114(91.2%)	232(92.8%)	

DISCUSSION

In this trial, we observed that menstrual irregularities were observed in 40(32.0%) of those with vaginal delivery and 37(29.6%) of those with C-section delivery (p=0.681). Menorrhagia was reported in 40(32.0%) females with vaginal delivery compared to 11(8.8%) with C-section delivery (p<0.001). Fever occurred in 21(16.8%) vaginal delivery cases and 36(28.8%) C-section cases (p<0.001).

A new method of contraception called PPIUCD combines family planning with maternal-child health care. This postpartum method provides women with reversible, long-term contraception before they are discharged from the delivery setting.[10,11] Although tubal ligation and the rapid implantation of an intrauterine contraceptive device (IUCD) may be performed during caesarean delivery (CD), IUCDs may have some advantages.[12] A new method of

contraception called PPIUCD combines family planning with maternal-child health care. It is a postpartum technique that gives women long-term reversible contraception prior to their release from the hospital. To increase community knowledge and acceptability, further PPIUCD research is required.[13]

Habib *et al.*, conducted research and found that, in terms of problems, vaginal discharge, back pain, stomach pain, and irregular menstruation did not significantly differ between the two groups (p>0.05). Infection rates in 1(1.67%) and 1(1.67%) patient who underwent caesarean sections and vaginal births did not significantly differ between the two groups, and expulsion in 4(6.67%) and 2(3.33%) patients (p>0.05). With a p-value of 0.042, Compared to the vaginal group, the removal rate was greater in the C-section group (11.67% vs. 3.33%). There were no perforations in any group.[9]

In a study by Khan *et al.*, IUCD expulsion was observed in 29(5.8%) female patients, 21(6.08%) SVD patients, and 8(5.16%) C-section patients (p-value=0.68). Five (1%), three (0.86%), and 2(1.29%) ladies experienced device malposition during SVD and C-section, respectively (0.66). 81 females (16.2%) experienced vaginal discharge, compared to 54(15.65%) in SVD and 27(17.41%) in C-section patients. 89 females (17.8%), 58 females (16.8%) with SVD, and 31 females (23.22%) with C-section reported menstrual issues (p=0.38). In 37(7.4%) of the instances, IUCD was removed; in 28(8.1%) of the SVD patients; and in 9(5.8%) of the cases when IUCD was placed following a C-section (p=0.36).[14]

According to one study, PPIUCD is a successful strategy for both vaginal and caesarean deliveries. The majority of customers (65.7%) expressed satisfaction with the process, indicating that there are no significant changes in efficacy or safety (menstrual complaints, fever, and vaginal discharge; p>0.05) according on the insertion method. There were no instances of perforation or failure in either group, and the risk of infection was negligible (only 1.8% vaginal discharge). Three occurrences of vaginal insertion resulted in spontaneous ejection. Compared to the vaginal insertion group (25%; p=0.02), the caesarean group had a greater prevalence of missing strings (48.5%).[5]

Halder *et al.*, conducted a study on 200 women, discovered that acceptability of PPIUCD was highest among those aged 21–25 (44%) and 25–30 years (23%), in both groups (vaginal insertion and intra-caesarean).[15] In the intra-caesarean group 5, 5% of women had bleeding, while 10% of those vaginal group had bleeding. But in 2% of intra-caesarean insertions, 10% of immediate postpartum insertions, and 6.6% of post-placental insertions, there were irregular, moderate, and intermittent bleeding.[15] Similar research revealed that 6.6% of caesarean insertions resulted in haemorrhage.[16] A study conducted by Sudha *et al.*, showed that PPIUCD is a successful intervention for both vaginal and caesarean deliveries, with no appreciable variations in safety or effectiveness based on the insertion method.[17]

The copper IUD is a very effective form of emergency contraception.[18] The rate of failure is around 0.1%. When used as long-acting reversible contraception, IUDs are also quite affordable.[18,19] An efficient and secure way to minimise and space out deliveries is to use IUCD in the early postpartum phase.

LIMITATION OF STUDY

Our main limitation was a lack of long-term follow-up to see further effects, if any, of PPIUCDs.

CONCLUSION

Based on this study, we may conclude that there were no statistically significant differences in the outcomes of immediate postpartum intrauterine contraceptive device insertion between caesarean and vaginal deliveries, except for the occurrence of menorrhagia and fever.

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Authors' Contribution

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

HS & GW: Data acquisition, data analysis, critical review, approval of the final version to be published.

NZ & SN: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

SA: 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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