

Compare the Immediate Postpartum Intrauterine Contraceptive Device (PPIUCD) Versus Interval IUCD in Caesarean and Vaginal Deliveries

Maryium Naz,¹ Sana Hassan,² Maria Tariq,³ Ayesha Javed,⁴ Uzma Nayyer,⁵ Bushra Kant⁶

¹Consultant Gynecologist, Social Security Hospital, Sargodha

²Senior Registrar, Akbar Niazi Teaching Hospital/IMDC, Islamabad

^{3,5}Assistant Professor, Akbar Niazi Teaching Hospital/IMDC, Islamabad

⁴Senior Registrar, Medicsi Hospital, Islamabad, ⁶Professor, Akbar Niazi Teaching Hospital/IMDC, Islamabad

Correspondence: Dr. Maria Tariq
Department of Obstetrics and Gynecology,
Islamabad Medical and Dental College,
Main Murree Road, Satran (17) Meel, Bhara Kahu, Islamabad.
Email: maria.tariq@imdcollge.edu.pk

Abstract

Objective: To compare the complications such as missing threads and irregular bleeding of immediate PPIUCD versus interval IUCD in cesarean and vaginal deliveries.

Methodology: A prospective comparative study involving 460 women was conducted at POF Hospital, Wah Cantt, Pakistan from November 2023 to November 2024. The study adhered to the WHO medical eligibility criteria for contraceptive use (MEC), with 230 women receiving the PPIUCD and 230 women receiving the interval IUCD. The participants were followed up at 1 month, 3 months, and 6 months post-insertion. The outcomes of the PPIUCD patients were compared with those of the interval IUCD patients. All the data were entered and analyzed using SPSS v 23.

The Pearson chi square test was used to compare the proportion of women with missing threads and irregular vaginal bleeding among patients.

Results: The average age of the women was 29.6±4.7 years. The rate of missing threads was significantly higher in patients with PPIUCD insertion (20.9%) compared to those with interval IUCD insertion (12.6%), with a $p < 0.05$. Irregular vaginal bleeding was more frequent in PPIUCD patients (18.7%) compared to those with interval IUCD insertion (10.9%), with a statistically significant difference ($p < 0.05$).

Conclusion: PPIUCD use was found to be a safe, simple, cost-effective, and reversible contraceptive method, with greater potential for long-term continuation.

Keywords: Cesarean section; Contraception; Family planning services; Intrauterine devices; Postpartum period.

Cite this article as: Naz M, Hassan S, Tariq M, Javed A, Nayyer U, Kant B. Compare the Immediate Postpartum Intrauterine Contraceptive Device (PPIUCD) Versus Interval IUCD in Caesarean and Vaginal Deliveries. *J Soc Obstet Gynaecol Pak.* 2025;15(2): 114-118. DOI. 10.71104/jsogp.v15i2.915

Introduction

According to the 2017 census, Pakistan's population is 210 million, with approximately nine million pregnancies occurring annually, of which 4.2 million were unintended.¹ Out of these unintended pregnancies, 54% led to induced abortions, while 34% resulted in unplanned births.² The postpartum period is a crucial time to address family planning needs and mitigate the risks of maternal mortality and child death.³ Intrauterine contraceptive devices (IUCDs), also referred to as long-acting reversible contraceptives (LARCs), offer several

benefits for postpartum use, including being an effective, long-term, reversible method of contraception. They are coitus-independent and do not interfere with breastfeeding.⁴

Postpartum family planning is typically initiated six weeks after childbirth. The early resumption of sexual activity, combined with unpredictable ovulation, often results in numerous unintended pregnancies within the first year postpartum.⁵ Additionally, in developing countries like Pakistan, women often do not return for

Authorship Contribution-^{1,2,3}Substantial contributions to the conception or design of the work or the acquisition, ¹Data Collection ³ Drafting the work or revising it critically for important intellectual content, ⁴Active participation in methodology, ⁶Final approval of the version to be published.

Funding Source: none
Conflict of Interest: none

Received: Dec 19, 2024
Accepted: April 17, 2025

routine postpartum check-ups after being discharged, let alone seek contraception services. This may be attributed to a lack of education and awareness, social pressures, and limited access to nearby healthcare facilities.⁶ IUCDs are typically inserted as an interval procedure, which occurs six weeks after delivery, or as a PPIUCD insertion, which can be performed post-placental (after placental expulsion in vaginal delivery) or intra-cesarean (during a cesarean section).^{7,8}

The objective of this study was to compare the complications such as missing threads and irregular bleeding of immediate PPIUCD versus interval IUCD in cesarean and vaginal deliveries.

Methodology

This prospective comparative study involving 460 women was conducted at Obstetrics and Gynecology Department Pakistan Ordinance Factories (POF) Hospital, Wah Cantt, Pakistan from November 2023 to November 2024. Following ethical approval from the institutional review board (Ref. No. POFH/ERC/156/24, Dated: 27/11/24), the women were consecutively enrolled in the study, with 230 assigned to the PPIUCD patients and 230 to the interval IUCD patients. The sample was determined using the WHO proportion formula, with a 95% confidence interval, an 80% test power, a 5% alpha type I error, and proportions of 7.9% for PPIUCD patients and 2.7% for interval IUCD patients.⁹ The study adhered to the WHO medical eligibility criteria for contraceptive use (MEC), women were included based on MEC criteria: vaginal or cesarean delivery (elective or emergency), received postpartum contraception counseling, consent for PPIUCD insertion, age over 22 years, and parity of two or more. Women were excluded if they had any of the following conditions: chorioamnionitis, prolonged rupture of membranes (>18 hours), unresolved postpartum hemorrhage, puerperal sepsis, or coagulation disorders.

Per speculum examination was performed using Cusco's speculum to assess IUCD thread visibility at the cervical Os. In cases where the thread was not visualized, ultrasonography (US) was used to confirm the presence and position of the IUCD. Irregular vaginal bleeding was assessed based on the patient's history in comparison to their previous menstrual patterns.

A structured proforma was designed to document complications. The patient's complete history, physical

examination, investigations, and verbal informed consent were obtained. There were three followed up visits at 1st, 3rd, and 6th months, with data collected by the authors.

IUCD used was Copper T 380A. Only gynecologists trained in IUCD insertion according to the national training program were responsible for inserting the devices. Proper fundal placement using long curved Kelly's placental forceps was strongly emphasized. AMTSL was routinely performed. After insertion counseling was provided before discharge. This included the IUCD client card, which indicated the type of IUCD, the insertion, and the review dates, along with advice on potential complication such as missing threads and irregular vaginal bleeding. The patients were advised to followed up at 1st, 3rd, and 6th months after insertion. At followed up, outcome measures were assessed in terms of missing threads, and irregular bleeding. These outcomes were compared between vaginal and cesarean insertions.

All the data were entered and analyzed using SPSS v 23. Descriptive statistics were used to analyze both quantitative and qualitative data. The Pearson chi square test was used to compare the proportion of women with missing threads and irregular vaginal bleeding among patients. A p value of ≤ 0.05 was considered significant. The relative risk, along with 95% CI, was calculated.

Results

A total of 460 women who delivered either vaginally or via C-section were selected. IUCD insertion was performed in 230 women in the PPIUCD patients and 230 women in the interval IUCD patients. The average age of the women was 29.6 ± 4.7 years. The average followed up period was 3.3 ± 2.1 months. The sociodemographic and obstetric profiles of PPIUCD patients and IUCD patients are presented in Table I.

A detailed comparison of missing thread distribution between PPIUCD and interval IUCD patients based on the mode of delivery and parity (Table II). The occurrence of missing threads is lower in vaginal deliveries (12.6%) compared to cesarean deliveries (20.9%). The number of women with missing threads is higher in PPIUCD patients than in interval IUCD patients across nearly all parity levels. A detailed comparison of irregular vaginal bleeding between PPIUCD and interval IUCD patients based on the mode of delivery (Table II). The number of women

experiencing irregular vaginal bleeding is higher in vaginal deliveries compared to cesarean deliveries.

Table I: The sociodemographic and obstetric profiles of women. (n=460)

Variables		PPIUCD patients (n=230) N (%)	Interval IUCD patients (n=230) N (%)
Age (years)	Mean ± SD	27.7±3.8	31.5±5.7
Age categories (years)	≤ 27	112 (48.7)	100 (43.5)
	> 27	118 (51.3)	130 (56.5)
Parity	2	69 (30)	49 (21.3)
	> 2	161 (70)	181 (78.7)
Gestational age (weeks)	36	53 (23)	65 (28.3)
	> 36	177 (77)	165 (71.7)
Delivery method	C-section	161 (70)	150 (65.2)
	Vaginal	69 (30)	80 (34.8)

Table II: Comparison of missing thread and irregular vaginal bleeding between PPIUCD and interval IUCD patients.

Variables		PPIUCD patients (n=230) N (%)	Interval IUCD patients (n=230) N (%)
Missing thread	C-section	38 (16.5)	23 (10)
	Vaginal	10 (4.4)	6 (2.6)
	Total	48 (20.9)	29 (12.6)
Parity	2	9 (3.9)	5 (2.2)
	> 2	39 (17)	24 (10.4)
Irregular vaginal bleeding	C-section	16 (7)	27 (11.7)
	Vaginal	9 (3.9)	16 (7)
	Total	25 (10.9)	43 (18.7)

The percentage of women experiencing irregular vaginal bleeding is higher in interval IUCD patients (18.7%) compared to PPIUCD patients (10.9%).

Table III presents the risk analysis for missing threads and irregular vaginal bleeding. A significant association was found between the contraceptive method (PPIUCD and interval IUCD) and the occurrence of missing threads ($p < 0.05$). Additionally, a significant association was observed between PPIUCD and interval IUCD patients and irregular vaginal bleeding ($p < 0.05$).

Table IV presents the association for missing threads and irregular vaginal bleeding with parity, gestational age and ages of the women.

Missing threads during follow-up visits raised concerns among patients. In PPIUCD patients, the incidence was higher among cesarean delivery patients (16.5%) compared to those with vaginal delivery (4.4%). Similarly, in interval IUCD patients, it was higher in cesarean cases (10%) than in vaginal deliveries (2.6%). This difference was statistically significant ($p =$

0.001). There was no observed increase in thread appearance over time (Table V).

Table III: Risk Analysis for missing threads and irregular vaginal bleeding.

	Missing thread		p-value	Odd ratio	95% CI	
	Yes	No			Lower	Upper
PPIUCD (n=230)	48	182				
Interval IUCD (n=230)	29	201	.018	1.83	1.11	3.02
Total	460	77	383			
Irregular vaginal bleeding						
PPIUCD	230	25	205			
Interval IUCD	230	43	187	.018	0.53	0.31
Total	460	68	392			

Table IV: Association for missing threads and irregular vaginal bleeding.

Variables		PPIUCD patients n=230		Interval IUCD patients, n=230		p-value
		Missing thread				
		Yes	No	Yes	No	
Ages (years)	≤ 27	24	88	7	56	.04
	> 27	24	94	22	145	
Parity	2	9	60	5	44	.02
	> 2	39	122	24	157	
Gestational age (weeks)	36	12	41	10	55	.02
	> 36	36	141	19	146	
Irregular vaginal bleeding						
		Yes	No	Yes	No	p-value
Ages (years)	≤ 27	12	100	19	44	.04
	> 27	13	105	24	143	
Parity	2	7	62	12	37	.05
	> 2	18	143	31	150	
Gestational age (weeks)	36	6	47	15	50	.05
	> 36	19	158	28	137	

Table V: Complications at follow up.

Variables		1st month	2nd month	3rd month
Missing thread in PPIUCD	C-section	38 (16.5)	38 (16.5)	38 (16.5)
	Vaginal	10 (4.4)	10 (4.4)	10 (4.4)
	p-value	0.001	0.001	0.001
Missing thread in interval IUCD	C-section	23 (10)	23 (10)	23 (10)
	Vaginal	6 (2.6)	6 (2.6)	6 (2.6)
	p-value	0.001	0.001	0.001
Irregular vaginal bleeding in PPIUCD	C-section	16 (7)	16 (7)	16 (7)
	Vaginal	9 (3.9)	9 (3.9)	9 (3.9)
	p-value	> 0.05	> 0.05	> 0.05
Irregular vaginal bleeding in interval IUCD	C-section	27 (11.7)	27 (11.7)	27 (11.7)
	Vaginal	16 (7)	16 (7)	16 (7)
	p-value	> 0.05	> 0.05	> 0.05

Discussion

This study compared IUCD complications, such as missing threads and irregular vaginal bleeding, between PPIUCD and interval IUCD in both cesarean and vaginal deliveries. The occurrence of missing threads is higher in PPIUCD (20.9%) compared to interval insertions (12.6%) ($p < 0.05$). Irregular vaginal bleeding is more common in interval IUCD (18.7%) compared to PPIUCD (10.9%). The results indicate that women with PPIUCD are more likely to experience missing threads, while those with interval IUCD are more prone to irregular vaginal bleeding.

In the context of the current global population explosion, the need for birth rate control has become a worldwide priority. As the 6th most populous country in the world, Pakistan is working to establish a system that promotes and ensures the effective use of contraception. Despite high contraceptive knowledge in Pakistan (> 90%), the contraceptive prevalence rate (CPR) remains low at 30%.¹⁰ The low CPR is primarily attributed to the socio-cultural setup in Pakistan, where, despite the willingness of women of reproductive age, cultural barriers prevent them from accessing healthcare centers to obtain a contraceptive method between pregnancies.¹¹ For many such women, childbirth presents a unique opportunity to adopt a contraceptive method like IUCD.¹² The IUCD is the most widely used reversible contraceptive method, preventing an estimated 60 million unintended pregnancies annually. The IUCD provides continuous effectiveness for 5 to 12 years.¹³

WHO states that IUCDs are cost-effective, with benefits outweighing the disadvantages, and they can be inserted by a mid-level skilled birth attendant.¹⁴ Women are offered IUCD placement at 4 points. The interval IUCD is inserted after 6 weeks of delivery. The PPIUCD is placed within 10 minutes after the expulsion of the placenta following vaginal delivery. The immediate PPIUCD is inserted after the post-placental period but within 48 hours of delivery. The intra-cesarean IUCD is placed during a C-section before suturing the uterine incision.¹⁵

Therefore, immediate PPIUCD insertion can be regarded as a safe and effective contraceptive method. It is a postpartum method that offers long-term, reversible contraception to women prior to their discharge from the delivery setting.¹⁶ Education and counseling can enhance the acceptance and continuation of immediate PPIUCD.

Conclusion

It is concluded that PPIUCD use was found to be a safe, simple, cost-effective, and reversible contraceptive method, with greater potential for long-term continuation to women prior to their discharge from the delivery setting. The results show that women with PPIUCD are less likely to experience vaginal bleeding, whereas women with interval IUCD are more likely to have irregular vaginal bleeding. The promotion of PPIUCD practice can play a significant role in increasing contraceptive acceptance in Pakistan.

References

1. Memon Z, Mian A, Ahmed W, Jawwad M, Muhammad S, Noorani AQ. Predictors of voluntary uptake of modern contraceptive methods in rural Sindh, Pakistan. *PLOS Glob Public Health*. 2024;4(4):e0002419. <https://doi.org/10.1371/journal.pgph.0002419>
2. Sathar Z, Singh S, Shah IH, Niazi MR, Parveen T, Mulhern O, et al. Abortion and unintended pregnancy in Pakistan: new evidence for 2023 and trends over the past decade. *BMJ Glob Health*. 2025;10(1):e017239. <https://doi.org/10.1136/bmjgh-2024-017239>
3. Gahungu J, Vahdaninia M, Regmi PR. The unmet needs for modern family planning methods among postpartum women in Sub-Saharan Africa: a systematic review of the literature. *Reprod Health*. 2021;18:1-5. <https://doi.org/10.1186/s12978-021-01089-9>
4. Bolling KR, Wahdan Y, Warnock N, Lott J, Schoendorf J, Pisa F, et al. Utilisation, effectiveness, and safety of immediate postpartum intrauterine device insertion: a systematic literature review. *BMJ Sex Reprod Health*. 2023;49(2):e1. <https://doi.org/10.1136/bmjshr-2022-201579>
5. Andualem G, Akilu A, Belay G, Feyisa W, Alemnew F. Factors associated with utilization of modern postpartum family planning methods during the extended postpartum period among mothers who gave birth in the last 12 months at Injibara town, Northwest, Ethiopia: a cross-sectional study. *Contracept Reprod Med*. 2022;7(1):25. <https://doi.org/10.1186/s40834-022-00191-y>
6. Baig M, Ali SA, Mubeen K, Lakhani A. Induced abortions in Pakistan: an afflicting challenge needing addressal. *Br J Midwifery*. 2021;29(2):94-98. <https://doi.org/10.12968/bjom.2021.29.2.94>
7. Kassa BG, Ayele AD, Belay HG, Tefera AG, Tiruneh GA, Ayenew NT, et al. Postpartum intrauterine contraceptive device use and its associated factors in Ethiopia: systematic review and meta-analysis. *Reprod Health*. 2021;18:1-12. <https://doi.org/10.1186/s12978-021-01273-x>
8. Koorapati S, Sandhya B, Kamma RC, Radhika P. A comparative study on safety and efficacy and complications of intra caesarean insertion of IUCD and post cesarean insertion of IUCD. *Int J Med Public Health*. 2023;13(4):136-140.
9. Amjad R, Yasmin RS, Ali A, Khattak MA, Iqbal F, Aziz I. Causes of induced abortion in married women of district Turbat of Baluchistan, Pakistan. *J Med Sci*. 2024;32(4):346-349. <https://doi.org/10.52764/jms.24.32.4.10>
10. Azmat SK, Temmerman M, Ali M. Accessibility and uptake of modern contraceptive methods in Pakistan—a critical view on what works. *J Pak Med Assoc*. 2021;71(11):20-32.
11. Ahmed F, Malik NI, Bashir S, Noureen N, Ullah S, Ahmed JB, et al. "An obedient wife never says "no" to her virtual god." High fertility conceptions and barriers to contraceptive use among mothers of

- Southern Pakistan: a qualitative study. *BMC Public Health*. 2024;24(1):2157. <https://doi.org/10.1186/s12889-024-19484-9>
12. Ghani A, Hashmi HA, e Sadaf D, Nadeem MS. Exploring Cultural Hindrances: A Thorough Examination of Men's Views on Family Planning, Decision-Making Authority, and Use of Contraception. *Pak J Humanit Soc Sci*. 2024;12(2):1241-1251. <https://doi.org/10.52131/pjhss.2024.v12i2.2140>
 13. Rana MJ, Goli S. The road from ICPD to SDGs: Health returns of reducing the unmet need for family planning in India. *Midwifery*. 2021;103:103107. <https://doi.org/10.1016/j.midw.2021.103107>
 14. Perry HB, Sachs JD. The investment case for strengthening primary healthcare and community health worker programs in low-and lower-middle-income countries. In *Oxford Research Encyclopedia of Global Public Health*. 2024. <https://doi.org/10.1093/acrefore/9780190632366.013.334>
 15. Davenport A, Morello L, Arora KS. Decision-making regarding immediate vs. interval postpartum levonorgestrel intrauterine device insertion timing. *Contracept Reprod Med*. 2023;8(1):24. <https://doi.org/10.1186/s40834-023-00221-3>
 16. Provinciatto H, Dias YJ, Magdalena SL, Moreira MV, de Freitas LR, Balieiro CC, et al. Immediate vs delayed postpartum insertion of long-acting reversible contraception methods: meta-analysis of randomized controlled trials. *Am J Obstet Gynecol*. 2024;232(2):139-149. <https://doi.org/10.1016/j.ajog.2024.09.019>