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Original Research Article

Comparative Observational Study on Acceptability and Complications of Postpartum Intrauterine Contraceptive Device After Vaginal Delivery and Caesarean Section in a Tertiary Care Centre

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Abstract

Introduction: Postpartum intrauterine contraceptive device (PPIUCD) insertion is a safe, reversible, and cost-effective method of contraception. It can be conveniently inserted after vaginal delivery or during caesarean section, providing immediate protection against unintended pregnancy. However, the acceptability and complication rates may vary depending on the mode of delivery.

Aims: To compare the acceptability and complications of PPIUCD insertion following vaginal delivery and caesarean section.

Materials and Methods: This prospective comparative observational study was conducted in the Department of Obstetrics and Gynaecology at Chittaranjan Seva Sadan College of Obstetrics, Gynaecology and Child Health, Kolkata, over a period of 18 months from December 2022 to May 2024. The first three months were utilized for planning and review of literature, the next twelve months for data collection, and the final three months for data analysis and dissertation writing. The study population comprised postpartum women eligible for immediate Copper T 380A insertion as per WHO Medical Eligibility Criteria (MEC), with a history of regular menstrual cycles for at least three months prior to the current pregnancy, and fulfilling all inclusion criteria. A total of 324 postpartum women were enrolled in the study**.**

Results: At 6 weeks follow-up, pelvic pain was significantly higher in Group A compared to Group B ($p = 0.0012$), while vaginal bleeding was comparable between the groups ($p = 0.8182$). At 3 months, expulsions were observed only in Group A (3.9%) but this difference was not statistically significant ($p = 0.073$). Missing IUCD strings were noted in both groups, more frequently in Group B (13.4% vs. 7.1%), though not statistically significant ($p = 0.0915$). Acceptability of PPIUCD was significantly higher in Group B (92.3%) compared to Group A (82.7%) ($p = 0.0168$).

Conclusion: PPIUCD is a highly acceptable and safe contraceptive method in both vaginal and caesarean deliveries. While expulsion is more common following vaginal insertion, caesarean insertion is associated with higher rates of missing strings. Proper counseling, skilled insertion, and regular follow-up can improve acceptability and minimize complications.

Keywords: Postpartum Contraception, Intrauterine Device, Vaginal Delivery, Caesarean Section, Acceptability, Complications.

Introduction

Family planning plays a crucial role in reducing maternal and infant morbidity and mortality by preventing unintended and closely spaced pregnancies [1].

The postpartum period offers a unique opportunity to initiate contraception, as women are highly motivated and are in contact with healthcare providers [2]. Among various methods, the postpartum intrauterine contraceptive device (PPIUCD) has emerged as a safe, effective, long-acting, and reversible contraceptive option [3]. The intrauterine contraceptive device (IUCD) has the advantages of being hormone-free, cost-effective, and rapidly reversible with high efficacy [4].

Postpartum insertion, either within 10 minutes of placental delivery after vaginal birth or during

caesarean section, ensures immediate protection against pregnancy or reduces the risk of unintended pregnancies in the first year after childbirth [5]. Acceptability of PPIUCD depends on factors such as counseling, education, cultural beliefs, and perceived safety [6]. Reported complications include pain, abnormal bleeding, infection, missing strings, expulsion, and rarely uterine perforation [7]. Expulsion rates are generally higher after vaginal insertion compared to caesarean insertion, while missing strings are more commonly reported after caesarean section [8].

Several studies from India and other developing countries have demonstrated that PPIUCD is underutilized despite its proven safety and effectiveness [9]. Hence, evaluating the acceptability and complications of PPIUCD following different modes of delivery is important to strengthen family planning services and improve maternal health outcomes [10].

The objective of this study is to evaluate the overall acceptability, expulsion rates, and complications associated with the use of postpartum intrauterine contraceptive device (PPIUCD). Specifically, it aims to assess the acceptance of postpartum contraception among couples, determine the expulsion rates, and identify various complications arising after insertion of CuT 380A within three months following delivery.

Materials and Methods

Study Design: Prospective comparative observational study conducted at a tertiary care centre.

Study Place: Department of Obstetrics and Gynaecology, The study was conducted at Chittaranjan Seva Sadan College of Obstetrics Gynaecology and Child Health, Kolkata.

Study Population: Women presenting at Obstetrics and Gynaecology department Of Chittaranjan seva sadan college of obstetrics gynaecology and child health, Kolkata who were eligible for immediate postpartum copper T 380A insertion as per WHO Medical Eligibility Criteria (MEC) [11], with previous regular menstrual cycles for at least 3 months before the current pregnancy, and those who meet the inclusion criteria.

Study Period: The study was conducted over a period of 18 months where first 3months was utilised for planning of study and review of literature, for next 12months data was collected followed by data compilation. Analyses of results and writing of dissertation was done in last 3 months. (December 2022 to May 2024).

Sample Size: 320 postpartum women.

Divided in 2 groups – VD / C/S

- VD = Vaginal Delivery
- C/S = Cesarean Section

A total of 320 women were initially enrolled in the study, with 160 participants assigned to each group: Group A (vaginal delivery) and Group B (cesarean section). During the 6-week follow-up period, 23 participants were lost to follow-up, leaving 297 women available for analysis, comprising 143 in Group A and 154 in Group B.

Inclusion Criteria

- Mothers between 18-45 years of age.
- Mothers with gestational age between 36 – 40 weeks.
- Mothers willing for PPIUCD and having no contraindication as per WHO Medical Eligibility Criteria (MEC) [11]
- Mothers willing for follow-up

Exclusion Criteria

- Women refusing to participate in study
- Women with fever during labour and/or delivery
- Women with active STD or other lower genital tract infection or high risk of STD.
- Women with history of unexplained vaginal bleeding.
- Women with ruptured membranes for more than 18 hours prior to delivery

Study Variables

- Pelvic pain at 6 Weeks
- Vaginal Bleeding at 6 Weeks
- Expulsion at 3 Months
- Missing String at 3 Months
- Acceptability

Statistical Analysis: Data from the study were analyzed using SPSS software, with continuous variables expressed as mean ± SD and compared using t-tests or Mann–Whitney U tests. Categorical variables were presented as frequencies and percentages, and compared using Chi-square or Fisher's exact tests. Kaplan-Meier analysis may be used for time-to-intervention comparisons. A p-value < 0.05 was considered significant.

Result

Table 1: Association of Pelvic pain between both groups at 6 Weeks

Group				
Pelvic Pain At 6 Weeks	**Group-A**	**Group-B**	**Total**	**P value**
Mild	7(4.9%)	9(5.8%)	16(5.4%)	0.0012
Moderate	23(16.1%)	6(3.9%)	29(9.8%)	
No	99(69.2%)	131(85.1%)	23(77.4%)	
Severe	14(9.8%)	8(5.2%)	22(7.4%)	
Total	143(100%)	154(100%)	297(100%)	

Table 2: Association of Vaginal Bleeding between both groups at 6 Weeks

Group				
Vaginal Bleeding at 6 Weeks	**Group-A**	**Group-B**	**Total**	**P value**
No	107(74.8%)	117(76%)	224(75.4%)	0.8182
Yes	36(25.2%)	37(24%)	73(24.6%)	
Total	143 (100%)	154(100%)	297(100%)	

Table 3: Association of Expulsion between both groups at 3 Months

Group				
Expulsion at 3 Months	**Group-A**	**Group-B**	**Total**	**P value**
No	122(96.1%)	142(100%)	264(98.2%)	0.073
Yes	5(3.9%)	0(0%)	5(1.8%)	
Total	127(100%)	142(100%)	269(100%)	

Table 4: Association of Missing String between both groups at 3 Months

Group				
Missing String at 3 Months	**Group-A**	**Group-B**	**Total**	**P value**
No	118(92.9%)	123(86.6%)	241(89.6%)	0.0915
Yes	9(7.1%)	19(13.4%)	28(10.4%)	
Total	127(100%)	142(100%)	269(100%)	

Table 5: Association of Acceptability between both groups

Group				
Acceptability	**Group-A**	**Group-B**	**Total**	**P value**
Acceptable	105(82.7%)	131(92.3%)	236(87.7%)	0.0168
Not Acceptable	22(17.3%)	11(7.7%)	33(12.3%)	
Total	127(100%)	142((100%)	269((100%)	

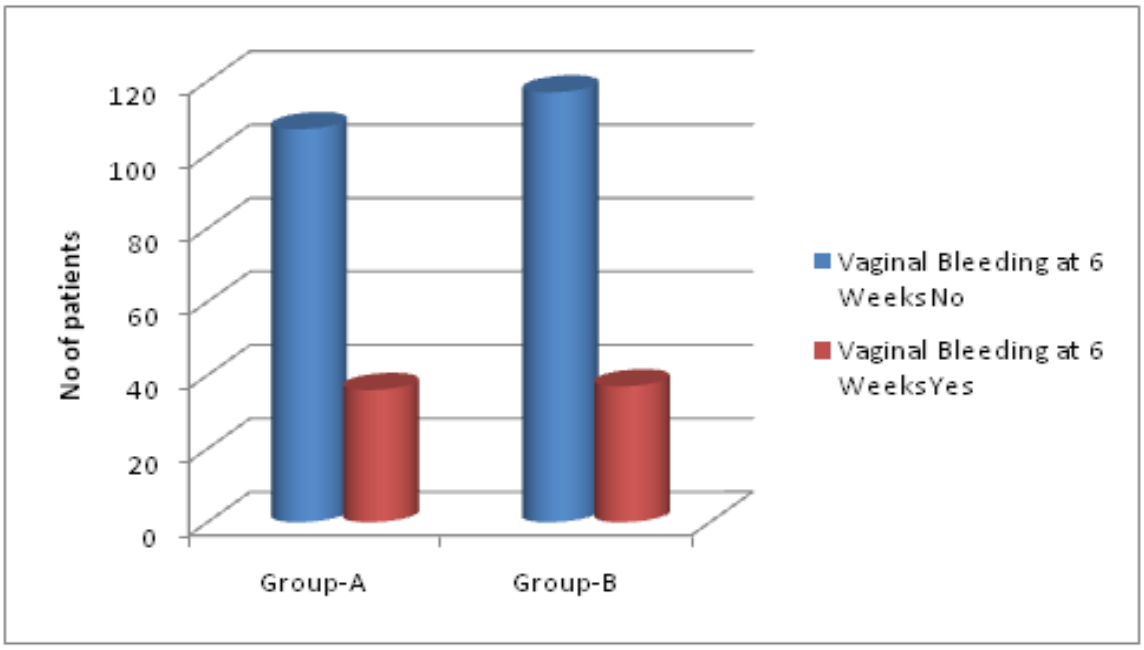

Figure 1: Association of Vaginal Bleeding between both groups at 6 Weeks

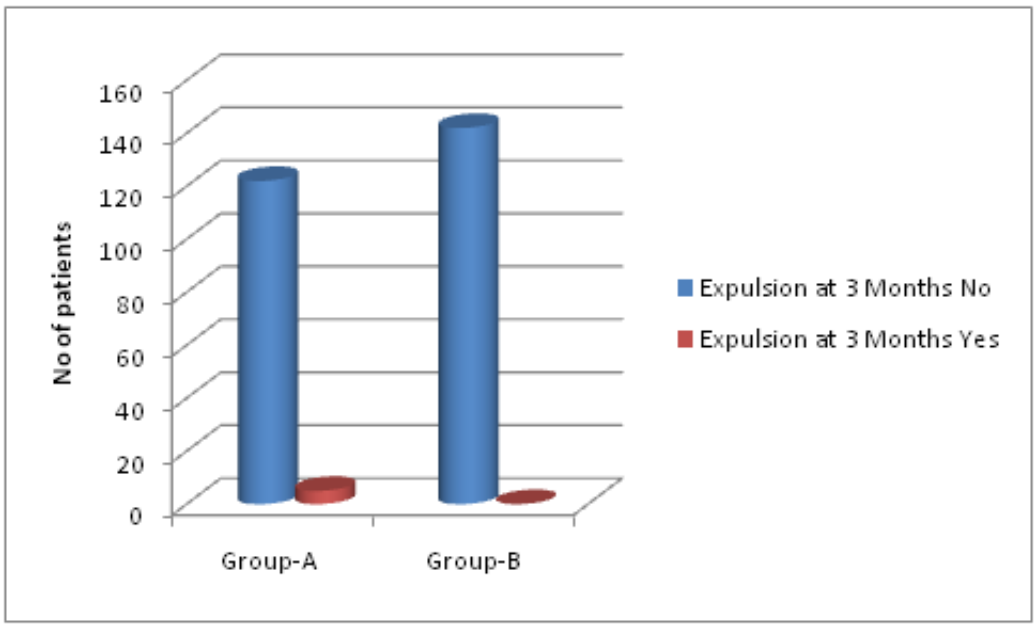

Figure 2: Association of Expulsion between both groups at 3 Months

In our study, at 6 weeks follow-up, pelvic pain was reported in both groups with varying severity. In Group A, 7 women (4.9%) had mild pain, 23 women (16.1%) had moderate pain, and 14 women (9.8%) had severe pain, while 99 women (69.2%) reported no pain. In Group B, 9 women (5.8%) had mild pain, 6 women (3.9%) had moderate pain, and 8 women (5.2%) had severe pain, while 131 women (85.1%) reported no pain. This showed a statistically significant difference ($p = 0.0012$).

In our study at 6 weeks, vaginal bleeding was reported in both groups. In Group A, 36 women (25.2%) reported bleeding while 107 women (74.8%) had no bleeding. In Group B, 37 women (24%) reported bleeding while 117 women (76%) had no bleeding. Which was not statistically significant ($p = 0.8182$).

In our study , At 3 months follow-up, expulsion of PPIUCD was observed only in Group A, where 5 women (3.9%) experienced expulsion, while 122 women (96.1%) retained the device. In Group B, no cases of expulsion were reported, with 142 women (100%) retaining the device .Which was not statistically significant ($p = 0.073$). In our study, At 3 months, missing IUCD strings were observed in both groups. In Group A, 9 women (7.1%) had missing strings, while 118 women (92.9%) had visible strings. In Group B, 19 women (13.4%) had missing strings, while 123 women (86.6%) had visible strings. which was not statistically significant ($p = 0.0915$). In our study, In terms of acceptability, Group A had 105 women (82.7%) who accepted PPIUCD, while 22 women (17.3%) did not. In Group B, 131 women (92.3%) accepted PPIUCD, whereas 11 women (7.7%) did not. Which was found to be statistically significant ($p = 0.0168$).

Discussion

In our study, pelvic pain at 6 weeks was significantly more common following vaginal PPIUCD insertion compared to intra-cesarean insertion. This observation is consistent with earlier reports, which noted that discomfort is more frequent after vaginal procedures due to less controlled placement and uterine contractions [12, 13].Vaginal bleeding at 6 weeks, however, was similar in both groups, showing no significant difference. Similar findings have been reported in previous studies, which also documented comparable bleeding and infection rates between vaginal and cesarean insertions [14,15]. Expulsion of the device was observed only in the vaginal insertion group in our study, though this was not statistically significant. A systematic review and meta-analysis reported higher expulsion rates after vaginal delivery compared to cesarean section, with pooled estimates suggesting nearly a fourfold difference [16, 17].

Other studies also demonstrated that expulsion is significantly more likely after vaginal insertion, though absolute rates remain low [18]. Missing IUCD strings were found to be more frequent in the cesarean group in our study, although not statistically significant. This is supported by Kanwat et al., who reported higher rates of missing strings following cesarean compared to vaginal insertion [12].With regard to acceptability, our study found significantly higher acceptance of PPIUCD in the cesarean group compared to the vaginal group. This aligns with the findings of Gunasingh et al., who observed that primiparous women undergoing cesarean section were more likely to accept the device [14]. However, Biswas et al. reported contrasting results, showing higher

acceptability in women following vaginal delivery [13]. These differences may be attributable to variations in counseling quality, cultural context, and perceptions of convenience between different populations.

Overall, our results suggest that intra-cesarean PPIUCD insertion has advantages in terms of comfort and acceptability, while vaginal insertion may carry a higher risk of expulsion. Missing strings appear to be more common in cesarean insertions, though without significant clinical consequences. These findings are consistent with international studies, which highlight that while both routes are safe and effective, careful counseling and follow-up are crucial to ensure sustained use and satisfaction [16, 19–21]

Conclusion

In our study, pelvic pain was more frequently reported following vaginal insertion compared to caesarean insertion, and this difference was statistically significant. Vaginal bleeding was observed in both groups at a similar rate, with no significant difference. Expulsion of the device occurred only after vaginal insertion but was not statistically significant.

Missing strings were more common after caesarean insertion, though the difference was not statistically significant. Overall, acceptability of PPIUCD was higher among women undergoing caesarean section, and this difference was statistically significant.

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