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A prospective study to evaluate the efficacy and complications of post partum intra uterine contraceptive device insertion

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Abstract

Background: India's rising population poses a significant challenge to the medical and healthcare facilities underscoring the need for effective postpartum contraceptive methods. Postpartum intrauterine contraceptive devices (PPIUCDs) are a safe, cost effective and long term contraceptives which are reversible, yet their acceptance remains suboptimal due to fear of complications, inadequate counselling and sociocultural factors.

Objectives: To evaluate the efficacy, complications, acceptance and satisfaction related to postpartum intrauterine contraceptive device insertion among women consulting in a tertiary care hospital.

Materials and Methods: This hospital-based prospective study was conducted in the Department of Obstetrics and Gynaecology at Mahatma Gandhi Medical College & Hospital, Jaipur, over 18 months, including 6 months of data collection and 12 months of follow-up. A total of 150 postpartum women who underwent PPIUCD insertion and consented to participate were included. Demographic characteristics, clinical outcomes, complications, discontinuation reasons, and satisfaction levels were analyzed using descriptive statistics and appropriate inferential tests, with $p < 0.05$ considered statistically significant.

Results: Most participants were over 35 years of age, multiparous, and belonged to the middle socioeconomic class. Higher education and parity were significantly associated with better acceptance of PPIUCDs. Complications were infrequent, with abdominal pain (6.67%), infection (6%), expulsion (10.67%), and a single case (0.67%) of partial uterine perforation. The majority of women reported no pain or minimal discomfort following insertion. Desire for future conception was the most common reason for discontinuation. Overall, 25.33% of participants expressed satisfaction and willingness to continue PPIUCD use.

Conclusion: PPIUCD is a safe, effective, and acceptable postpartum contraceptive method. Improved counseling, awareness, and provider training can further enhance its uptake and continuation.

Keywords: Postpartum intrauterine contraceptive device, PPIUCD, postpartum contraception, family planning, maternal health

Introduction

India has witnessed an exponential rise in population over several decades, with an average growing rate of 1.8% annually since 1999.^[1] Recent projections indicate that the population is expected to increase up to 1.69 billion by 2054, as projected by the United Nations Department of Economic and Social Affairs (DESA). Due to this, significant pressure has increased on the health system and highlights the urgent need for efficient family planning.

Sterilization has been practiced commonly in India, followed by condoms and oral contraceptives, while postpartum intrauterine contraceptive devices (PPIUCDs) are least preferred.^[2] The selection of contraceptive is largely influenced by demography, economic, cultural and social factors. Despite the proven efficacy of PPIUCDs, their usage remains very low. Recognizing this gap, the government of India has prioritized increasing the use of PPIUCDs as a part of the Family Planning 2020 initiative^[3].

Postpartum insertion of IUCDs has several clinical advantages.

The insertion of PPIUCDs has many advantages. Women in the immediate postpartum period are often open to use contraception, especially during the initial 48 hours of delivery. Many countries like China, Mexico and Egypt have been successful in implementing this approach and have increased contraceptive coverage^[4]. For younger women, this can avoid unplanned

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pregnancies and provide a safe and reliable contraceptive method. Despite these benefits, literature states the existence of multiple deterrents to PPIUCD acceptance. Some of which are incompletee information regarding the device, lack of family support, fear of complications and preference for alternative contraceptive methods. Resolving these issues are pivotal for improving use of PPIUCDs among women [5].

Sexual health education, awareness on contraceptive methods, availability of better health care infrastructure etc. are indispensably linked towards better maternity and women health care. As the available literature on PPIUCDs are limited, there is a need for contemporary investigations, examining the outcomes as well.

The present study seeks to elucidate factors directly or indirectly related to the acceptance, success and failure of PPIUCDs. The proposed measures include comprehensive patient counselling about PPIUCD function, benefits and potential adverse effects, motivational strategies for women and spouses related to contraception and gap between births, awareness campaigns and increasing trust between healthcare professionals and patients.

Material and Methods

This prospective study was conducted in the Postgraduate Department of Obstetrics and Gynaecology, Mahatma Gandhi Medical College & Hospital, Jaipur. It was designed to be a hospital based prospective study.

The duration of the study was 18 months which included 6 months of Data Collection and 12 months of follow up observations.

Sample Size

All females who report to Mahatma Gandhi Hospital with history of Post-Partum IUCD insertion during the 12 months of data collection and give consent will be included in the study after fulfilling the inclusion and exclusion criteria.

Inclusion criteria

1. All females who report to Mahatma Gandhi Hospital with history of Post-partum IUCD insertion, irrespective of their booking location.
2. All females willing to participate in study.

Exclusion criteria

Patients who refused to participate in the study.

Statistical Analysis

All the collected data was recorded in Microsoft Excel and analyzed. Categorical variables have been described as frequencies and percentages. Discrete variables have been described in terms of median and interquartile range. Continuous variables will be summarized as mean and standard deviation and finally the appropriate statistical tests will be applied for data analysis. p value <0.05 will be considered statistically significant.

Results

The study analyzed the demographic, clinical, and satisfaction data of 150 women who received postpartum intrauterine contraceptive devices (PPIUCD). Significant associations were found between age, socio-economic status, education, parity, and other factors with the outcomes of PPIUCD use, particularly expulsion and complications. Most women reported minimal pain during insertion, and the majority expressed satisfaction with the method. Common causes for discontinuation included desire to conceive and complications. Table 1 represents the age distribution in which the majority of the participants were over 35 years and significant difference between the distribution was observed. Most of the participants belonged to the middle class and very few were from lower and upper class. This difference was statistically significant. Participants with higher education were significantly more acceptable towards PPIUCD as compared to the other groups. Multiparous women were predominant, showing significant outcome differences by parity ($p<0.01$), while mode of delivery differences were not significant (Table 2). Only 6.67% participants experienced lower abdominal pain after insertion of PPIUCD. Around 10.67% patients faced expulsion of PPIUCD. Maximum participants (59.34%) did not feel any pain or discomfort after the application of PPIUCD while some of them felt little discomfort or pain (Table 4). Around 34% participants wanted to remove PPIUCD as they wanted to conceive again and 25% wanted to continue to with this form of contraception (Table 5). Around 25.34% participants were satisfied with the experience of using PPIUCD (Table 6). A single case of perforation was seen in the study population. Transvaginal ultrasonography suggested intrauterine location of the PPIUCD; however, hysteroscopic evaluation revealed perforation with the Cu T embedded within the endometrium and its horizontal limbs partially buried. After carefully incising the endometrium around the impacted arms and freeing the surrounding tissue, the Cu T was successfully grasped and removed intact, confirming a case of partial uterine perforation by the device (Fig. 1 to 3).

Table 1: Distribution of Participants by Age Group and Association with PPIUCD Outcomes

		Number of patients	Percent	Chi square value	p value
Age groups	20-25	35	23.33	11.16	0.03*
	26-35	47	31.33		
	>35	68	45.33		
$n = 150$, p value was calculated using χ^2 , df = 2, * $p<0.05$					
Socio-economic status	Lower	47	31.34	22.36	<0.01**
	Middle	75	50		
	Upper	28	18.67		
$n = 150$, p value was calculated using χ^2 , df = 2, ** $p<0.01$					
Occupation	Housewife	44	29.34	1.44	0.48
	Employed	50	33.34		
	Others	56	37.34		
$n = 150$, p value was calculated using χ^2 , df = 2, ** $p<0.01$					
Education	Graduate	97	64.67	134.21	<0.01**
	Primary	18	12		
	Secondary	30	20		
	Non-Formal	5	3.34		
$n = 150$, p value was calculated using χ^2 , df = 3, ** $p<0.01$					

Table 2: Parity and Mode of Delivery among Participants

Parity		Number of patients	Percent	Chi square value	p value
	Primi	53	35.34	12.90	<0.01**
Multi	Multi	97	64.67		
	n = 150, p value was calculated using χ^2 , df = 2, **p<0.01				
Mode of delivery	Normal Vaginal	86	57.34	3.22	0.07
	LSCS	64	42.67		
n = 150, p value was calculated using χ^2 , df = 1					

Table 3: Complications and Satisfaction Levels Post-PPIUCD Insertion

Complications	Yes	Percent
Lower Abdominal Pain	10	6.67
Heavy Menstrual Bleeding	3	2.00
Infection	9	6.00
Thread not visible	3	2.00
Perforation	1	0.67

Table 4: Patient Perception of Post-PPIUCD Insertion Experience

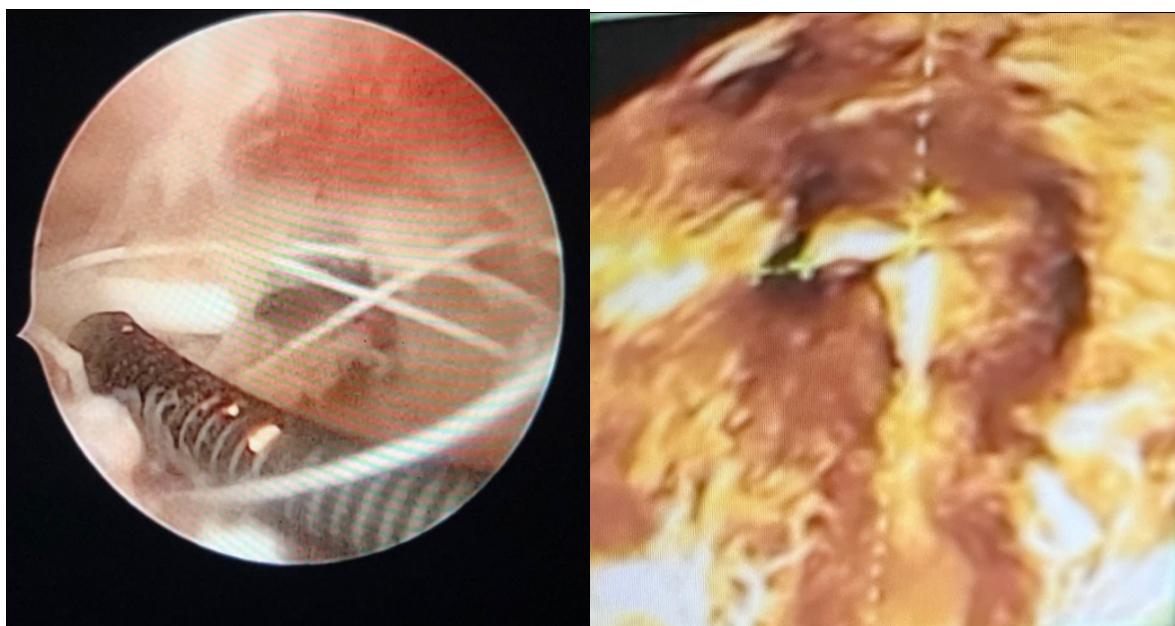
Client Perception after PPIUCD Insertion	Number of patients	Percent
No Pain	89	59.34
Little Discomfort	25	16.67
Somewhat Painful	22	14.67
Very Painful	14	9.34

Table 5: Reasons for Discontinuation of PPIUCD

Causes for discontinuation of PPIUCD	No. of patients	Percent
Complications	32	21.33
Sexual interference	5	3.33
Preference for other methods	12	8.00
Fear of side effects	11	7.33
Want to conceive	15	10.00

Table 6: PPIUCD satisfaction

	No. of patients	Percent
Want to continue with PPIUCD/ Satisfied	38	25.33

**Fig 1:** (a) TVS suggestive of intrauterine presence of Cu T (b): PPIUCD lying in utero on hysteroscopic entry

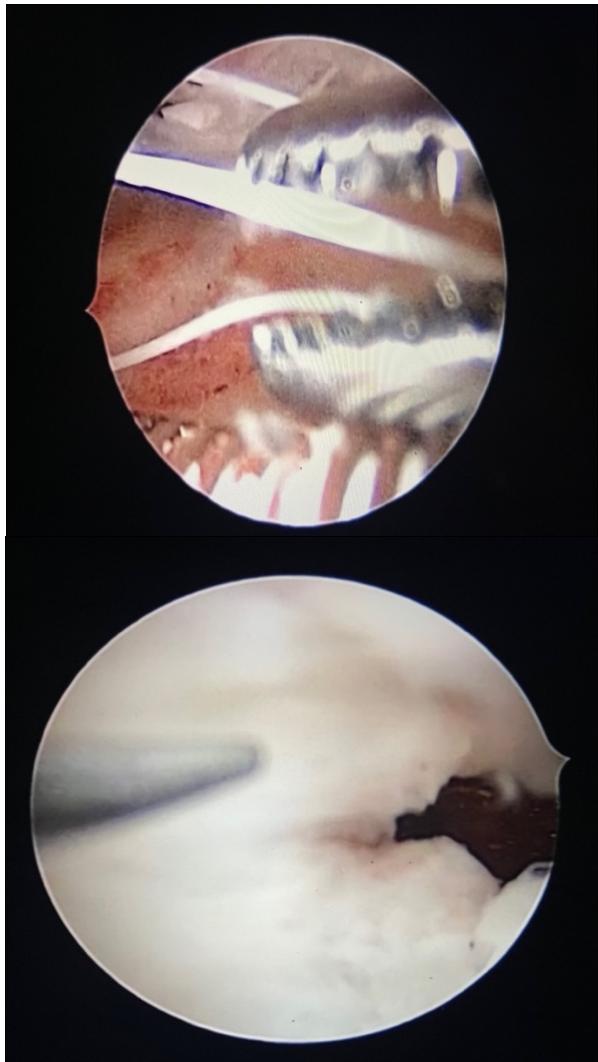


Fig 2: Endometrium cut around the ends of the horizontal limbs (b): After releasing the surrounding endometrium, Cu T threads pulled out using a grasper

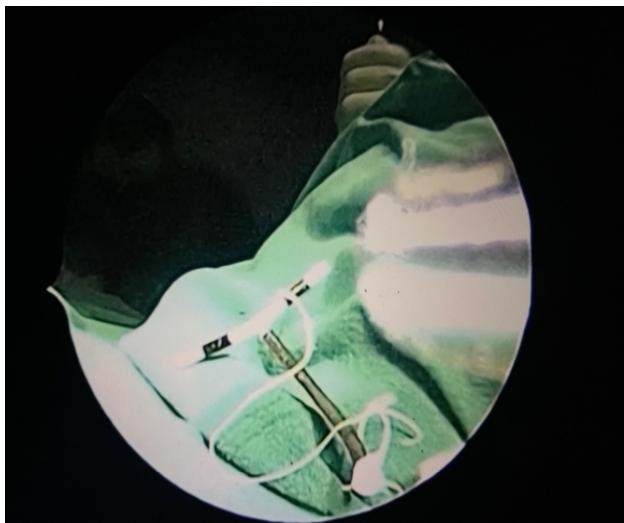


Fig 3: (c) The retrieved Cu T

Discussion

India's exponentially increasing population necessitates immediate efforts towards birth control measures. The regulatory bodies promote both semi permanent and permanent contraceptive methods. In India, following cultural norms, female sterilisation is the most common contraceptive method

while male sterilization and use of condoms is less favoured.⁶ PPIUCDs can provide an effective, long term and low maintenance contraception which is cost effective and empowering for women.

Women in rural areas often become pregnant soon after childbirth, sometimes within a year owing to early resumption of sexual activity and limited contraceptive counselling. Women often don't visit healthcare facilities for post partum follow ups, exacerbates this cycle. To address these barriers, the current study was designed to assess both complications and factors contributing to PPIUCD non acceptance.

Out of the 150 participants, the majority were above 35 years. This distribution was statistically significant, aligning with national trends indicating that older multigravida women are more likely to consider PPIUCDs. These results were supported by the studies of Halder *et al.*, 2016 and Katheit and Agarwari, 2013^[7, 8]. In terms of gravida, 64.67% women were multigravida echoing findings published by Aluka *et al.*, 2018^[9].

It was observed that majority of participants who accepted PPIUCDs were employed formally or informally. Furthermore, women who were graduates or had higher education also made majority of the cohort implying that education and occupation both play a crucial role in accepting contraceptive methods. Agarwal *et al.*, 2013^[8] and Jairaj, 2016^[10] had published similar kind of data. Women with multiple pregnancies were more open to PPIUCDs and the difference was statistically significant. Gupta *et al.*, 2023 also published results aligning with the current study^[11]. The difference between the type of delivery was not significant.

One of the major issues for denial of PPIUCDs is fear of complications. In the present study we observed that majority of women, *i.e.* 82% of the total patients did not have any complications while a very little percent of women (6.67%) experienced abdominal pain. The difference was statistically significant implying that the use of PPIUCDs did not have any side effects on majority of the patients. Similar results were presented by Nalini *et al.*, 2023 and Bharia *et al.*, 2023^[12, 13]. Some other complications such as heavy menstrual bleeding and infection were encountered by patients, lost strings were reported in 2% patients. Similar percentage of complications were also reported by Vishwakarma *et al.*, 2020^[14].

Perforation is a rare occurrence but yet one case of partial perforation was observed in the current investigation. The occurrence of PPIUCD perforation is 1 in 1000 cases. Gupta *et al.*, 2016 also reported a rare case of PPIUCD perforation^[15].

The aim of the current study was to understand the perception of patients after PPIUCD insertion. As the experience will determine whether they will continue with the same type of contraception or will they shift to something else. To understand this, in the follow up visits we observed that most of the patients under study did not experience any pain or discomfort (59.34%) while 16.67% felt a little discomfort. Around 14.67% patients felt a little pain after insertion while 9.34% patients reported the high levels of pain after insertion of PPIUCD. Similar results were reported by Kumar *et al.*, 2014.

Apart from this, 52% of the patients who want to conceive again also opted for PPIUCDs as it gives a proper time period to plan their next pregnancy. In the present study, higher percentage of women did not face any complications and were satisfied with this type of contraception implying that with better healthcare facilities and awareness, the use of PPIUCDs can be increased. Patients wanted to discontinue their PPIUCD due to various reasons in their follow up visits. Around 10% of patients wanted to remove the PPIUCD as they want to conceive again while 8%

patients prefer other methods of contraception as compared to PPIUCD. Around 21.33% patients faced some complications due to which they opted for removal while 7.33% of the patients feared complications due to IUD. Very few percent of patients (3.33%) found PPIUCD to be interfering with intercourse. Similar results were presented by Shiferaw *et al.*, 2023 [17]. It was interesting to note that 25.33% of the patients wanted to continue using PPIUCD as a method of contraception.

Conclusion

The present study provides valuable insights into the acceptance, effectiveness, and complications associated with postpartum intrauterine contraceptive device (PPIUCD) insertion in an Indian population. The findings indicate that PPIUCD is a safe, effective, and viable method of contraception, particularly in resource-limited settings where follow-up visits for contraception counseling and administration may be challenging.

A significant proportion of the study population successfully retained their PPIUCDs without experiencing major complications, suggesting that with proper counseling and insertion techniques, PPIUCD can serve as a reliable long-term contraceptive method. The overall expulsion rate was within the range reported in previous studies, and while some women did experience minor complications such as pain, string loss, and expulsion, these were not severe enough to undermine the overall safety and feasibility of the intervention. Importantly, cases of perforation were rare, reinforcing the clinical safety of this contraceptive option when inserted under proper guidelines. One of the critical observations in this study was that fear of complications remains a major barrier to PPIUCD acceptance. Despite the demonstrated safety profile, misconceptions regarding pain, potential side effects, and interference with sexual activity influenced some women's decisions to discontinue use. This highlights the need for more targeted awareness campaigns and comprehensive counseling to address these concerns, ensuring that women are making informed choices based on evidence rather than fear or societal norms.

Another key finding is that women who had previous childbirth experiences were more likely to opt for PPIUCD, reflecting an increased acceptance among multiparous women. Additionally, educational and socioeconomic factors influenced decision-making, with a higher proportion of educated women opting for PPIUCD use. This suggests that better access to information and healthcare services can improve uptake rates.

The study also revealed that many women discontinued PPIUCD due to their desire for future pregnancies rather than complications, indicating that those who adopted this method largely found it acceptable and effective. Given that many women in rural areas do not return for follow-up visits after childbirth, immediate postpartum PPIUCD insertion offers a critical opportunity to provide long-term contraception at a time when women are already engaged with the healthcare system.

Furthermore, healthcare provider perceptions played a role in the overall success of PPIUCD adoption. Most providers found insertion to be a straightforward process, and proper training in insertion techniques can further reduce the risk of complications such as expulsion and string loss.

In summary, this study underscores the potential of PPIUCD as a cost-effective and practical contraceptive strategy in India and other developing countries. However, increasing awareness, improving provider training, and addressing myths and fears surrounding PPIUCDs are essential steps to enhance acceptance and continuity of use. With appropriate healthcare interventions,

PPIUCD could become a widely accepted and preferred method of postpartum contraception, ultimately contributing to better family planning outcomes and improved maternal health.

Conflict of Interest

Not available

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