



# Acceptance of Immediate Postpartum Intrauterine Contraceptive Device (PP-IUCD) Insertion and its Associated Factors: A Hospital Based Prospective Study

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## KEYWORDS

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## Abstract

**Introduction-** Orthodontic treatment is an effective way to cure aesthetic problems of teeth. With recent advanced, photobiomodulation (PBM) has become an important add-on in the orthodontic treatment. Current review aimed to evaluate the efficacy of PBM systematically on accelerating the alignment rate for further application in orthodontic treatment.

**Material and Method-** Articles were searched on Cochrane Library, ScienceDirect, PubMed, Scopus and Web of Science etc. Based on the guidelines of Cochrane Handbook for Systematic Reviews of Interventions and PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) we included 6 articles in the current review. Abstract, case-reports, animal studies, studies including <10 subjects and studies without vital data were excluded. Data was collected and analysed using Review Manager 5.3. P-value<0.05 was considered to be statistically significant.

**Result-** After applying exclusion criteria, we were left with 6 articles from different geographical areas in our review. PRISMA guidelines were used for articles selection. Two of the articles showed a high risk of bias and four articles showed low risk. This systematic review observed that PBM significantly increased the orthodontic tooth movement (OTM) and with due course of time the rate of OTM further increased. PBM showed no difference in OTM in the 1<sup>st</sup> month but in the 2<sup>nd</sup> and 3<sup>rd</sup> months, a significant difference was seen. Variability/Heterogeneity among articles was significant.

**Conclusion-** PBM can increase the rate of OTM especially in the 2<sup>nd</sup> and 3<sup>rd</sup> month due to the accumulative effect of radiation. Therefore, PBM can be an important adjunct to the orthodontic treatment.

## Introduction

The postpartum period represents a critical juncture in a woman's reproductive life, offering a unique window of opportunity for family planning interventions.(1) Immediate postpartum intrauterine contraceptive device (PP-IUCD) insertion, a safe and effective contraceptive option, holds the potential to address unmet contraceptive needs and contribute to maternal and child health.(2) However, despite its proven efficacy, the acceptance of PP-IUCD varies among postpartum women, influenced by multifaceted factors. Understanding the determinants of PP-IUCD

acceptance, the associated complications, and the nuanced interplay of sociodemographic and obstetric characteristics is essential for informing healthcare practices and policies.(3)

The acceptance or refusal of PP-IUCD involves intricate decision-making processes shaped by sociocultural, educational, and individual factors.(4) Exploring the reasons behind acceptance and refusal can guide healthcare providers in tailoring counselling strategies to address specific concerns and preferences. Additionally, assessing the rates of complications such as expulsion, abdominal pain, and bleeding is crucial for evaluating



the safety and acceptability of PP-IUCD in diverse postpartum populations.(5, 6)

Increasing numbers of women in India are having their babies born in hospitals after introduction of Janani Suraksha Yojana (JSY) and Janani Shishu Suraksha Karyakaram (JSSK).(7, 8) It allows opportunity for the state to provide PP-IUCD in a big way. IUCD can be inserted safely at any time during the first 48 hours after delivery, can also be inserted after 6 weeks postpartum (Extended PP) and after an abortion (Post Abortal).(9) Despite the many advantages of the IUCD as a method of family planning, in India, less than two percent of women use the IUCD as their modern contraceptive method of choice.(10) National program provides incentives to health care providers to promote sterilization, and very little importance is given to IUCD or other temporary contraceptive methods. Against this background, the primary objective of the present study was to determine the proportion of women accepting immediate postpartum intrauterine contraceptive device (PP-IUCD) insertion. The other objectives were to determine the factors (including sociodemographic, obstetric characteristics and future pregnancy desires) associated with acceptability of immediate PP-IUCD insertion in women; and to determine the rates of uterine perforation, expulsion, pelvic infection, lost strings, and displacement following PPIUCD insertion among the acceptors by 6 to 18 months.

## Materials and methods

This was a prospective study conducted in the department of Obstetrics and Gynaecology, Vinayaka Mission's Kiruparananda Variyar Medical College and Hospital, Salem between June 2020, and June 2021. The study was approved by the Institute Human Ethics Committee (IHEC). The content of Participant Information Sheet (PIS) in local language was provided to the participants (and their attenders) and contents were read to them in their own language to their satisfaction. The participants were enrolled in the study after obtaining written informed consent. The study enrolled all women 18 to 40 years of age, between 36 and 40 weeks of gestation, admitted and delivered at the department, counselled for PP-IUCD, had desire to have Cu-T after counselling, with haemoglobin more than 8 gm/dl and without infections. However, women presenting with fever during labour and delivery, active sexually transmitted diseases (STD), other lower genital tract infection or high risk for STD, known to have

ruptured membranes for more than 24 hours prior to delivery, known case of uterine abnormalities e.g., bicornuate/septate uterus, uterine myomas, patients with manual removal of the placenta and unresolved postpartum haemorrhage or postpartum uterine atony requiring use of additional oxytocic agents in addition to active management of third stage of labour were excluded.

We used nonprobability convenient sampling technique to include a total of 100 cases. The insertion techniques followed were post-placental insertion – with modified Kelley placental forceps using no-touch technique; and intra-caesarean insertion of the IUCD. Prior to discharge, the patient was informed about the IUCD side effects, normal postpartum symptoms, IUCD follow-up/postnatal care/newborn check-up, and danger signs (foul smelling vaginal discharge, lower abdominal pain, especially if accompanied by fever or chills).

The data obtained was manually entered into Microsoft Excel, coded, and recoded. Analysis was done using Statistical Package for the Social Sciences (SPSS) v23. Descriptive analysis was presented using numbers and percentages for categorical variables and mean (standard deviation) or median (interquartile range) for continuous variables. To test for association, Chi-square test or Fisher's exact test (two sided) was used for categorical data. Statistical significance was considered at  $p < 0.05$ .

## Results

In the present study, it was observed that 60.0% participants declined PP-IUCD insertion, resulting in an acceptance rate of 40.0% ( $n = 100$ ). The most common reason for refusal was lack of partner consent (37.3%), followed by preference for other methods (32.0%). Other reasons were fear of pain and/or heavy bleeding (17.3%), religious concerns (4.0%) and no specific reason (9.3%), in that order. On the other hand, the most common reasons for acceptance were sense of safety (43.0%) and need for limited hospital visits (37.0%). Other reasons were its long-term utility (11.0%), reversible nature (4.0%), non-interference with breast feeding (3.0%), and non-hormonal characteristic (2.0%), in that order.

**Distribution of study participants:** The mean (SD) age of the participants was 23.3 years (2.9), with majority between 18 and 24 years of age. More than one third (38.0%), were between 25 and 29 years of age. Nearly half (44.0%) had completed secondary education, and more than one in three (36.0%) had completed primary



education. Based on socioeconomic status, nearly two third (60.0%) were from class III. Three fourth participants (76.0%), followed by 18.0% being Christians. Based on parity, 76.0% were primiparous and 24.0% were multiparous. More than half the participants (57.0%) delivered through normal vaginal, whereas 4.0% required assisted or instrumental vaginal and 39.0% required caesarean section (39.0%).

**Complication reported from PP-IUCD insertion:** The complications reported from PP-IUCD insertion in summarised in Table 2. Though 56.0% participants reported no pain, 22.0% participants reported somewhat pain or very much pain. Three fourth participants reported (74.0%) no complications; however, the rate of expulsion was 5.0%, abdominal pain was 4.0%, lost strings was 6.0%, and menstrual problem or bleeding was 9.0%. Of the five participants reporting expulsion, 80.0% of expulsion happened within a week and the remaining 20.0% reported expulsion between one and six weeks.

**Association between complications and age, parity and mode of delivery:** The results of the association between complications and age showed that expulsion of PP-IUCD was significantly associated with increasing age – 3.3% women aged 18 to 24 years had expulsion, compared to 5.3% among women aged 25 to 29 years and 100% among women 30 to 34 years of age ( $p < 0.05$ ). However, the results showed no statistical association between lost strings, abdominal pain, bleeding and age ( $p > 0.05$ ).

The results of the tests of association between complications and parity showed that the rate of expulsion was higher among multiparous women (16.7%) in comparison with primiparous women – a statistically significant difference ( $p < 0.05$ ). However, the results showed no statistical association between lost strings, abdominal pain, bleeding and parity ( $p > 0.05$ ).

The results of the tests of association between complications of PP-IUCD insertion and mode of delivery showed that none of the complications (expulsion, lost strings, abdominal pain, bleeding or menorrhagia) were statistically associated with mode of delivery ( $p > 0.05$ ).

## Discussion

In the present study, acceptance rate of 40.0% is noteworthy, and the reasons for both acceptance and refusal shed light on the complex factors influencing postpartum contraceptive choices. The finding that lack

of partner consent was the most common reason for refusal aligns with existing literature on the significance of spousal approval in contraceptive decision-making.(11, 12) This underscores the importance of involving partners in family planning discussions and interventions. The preference for other contraceptive methods, reported by 32.0% of refusers, emphasizes the need for a diverse array of family planning options to meet the varied preferences and needs of postpartum women.(13) The reasons for acceptance, such as a sense of safety and the need for limited hospital visits, suggest that perceived safety and convenience are significant drivers of PP-IUCD acceptance. Similar findings have been reported in studies highlighting the role of perceived efficacy and ease of use in contraceptive decision-making.(14, 15) The recognition of long-term utility and reversibility as factors contributing to acceptance underscores the importance of education and counselling in conveying the advantages of PP-IUCD as a reliable and reversible contraceptive option.(16) To address the high rate of partner non-consent, interventions promoting spousal communication and education about the benefits of PP-IUCD could be implemented. Targeted educational campaigns may dispel misconceptions and alleviate concerns related to the contraceptive method. Recognizing that fear of pain and/or heavy bleeding is a prevalent reason for refusal, healthcare providers should emphasize pain management strategies and provide detailed information about expected side effects during counselling sessions.(17) Policies promoting joint decision-making and family planning education could contribute to increased acceptance rates.(18) Patient-centered care, where individual preferences and concerns are acknowledged, can contribute to improved contraceptive outcomes.(19)

The mean age of participants (23.3 years) indicates a relatively young cohort, with a majority falling between 18 and 24 years. This finding aligns with the global trend of early childbearing in certain populations, emphasizing the need for effective family planning options among young women.(20) Younger age groups often face unique challenges and considerations in contraceptive decision-making, and understanding these factors is crucial for tailoring family planning interventions to specific age demographics.(21) The educational distribution, with a significant proportion having completed secondary education (44.0%), and a substantial number with primary education (36.0%),



reflects the diverse educational backgrounds of the study participants. Education has been shown to correlate with contraceptive knowledge and use.(22) The majority of participants belonging to socioeconomic class III (60.0%) may have implications for the accessibility and affordability of contraceptive services. Socioeconomic factors are known to influence contraceptive choices, with disparities in usage observed across different socioeconomic strata.(23) The fact that 76.0% of participants identified as Hindus and 18.0% as Christians indicates a religiously diverse study population. Understanding the influence of religious beliefs on contraceptive decision-making is important, as religious values can impact the acceptability of certain contraceptive methods.(24) The high percentage of primiparous participants (76.0%) suggests that a substantial portion of the study population was experiencing their first childbirth. Primiparity is often associated with unique considerations in family planning, and addressing the needs of first-time mothers is critical for promoting effective contraceptive use.(25) The distribution of delivery modes highlights the diversity in obstetric experiences. Different modes of delivery may impact postpartum contraceptive decision-making, with considerations for recovery and future fertility intentions.(26) The demographic and obstetric characteristics discussed above have implications for the counselling and accessibility of PP-IUCD. Tailoring counselling messages to address the specific needs and concerns of young, primiparous women with varying educational backgrounds is crucial. Socioeconomic status may influence the availability of healthcare resources and services, highlighting the importance of ensuring equitable access to PP-IUCD for all socioeconomic classes.

Approximately 56.0% of participants reported no pain, indicating that a substantial proportion experienced a painless or minimally painful insertion process. This aligns with previous research suggesting that the pain associated with IUCD insertion varies among individuals, with factors such as anxiety, parity, and clinician skill influencing the perception of pain.(27, 28) The majority of participants (74.0%) reported no complications following PP-IUCD insertion, indicating a generally well-tolerated procedure. This finding is consistent with studies demonstrating the safety and efficacy of immediate PP-IUCD insertion.(29) The reported rates of expulsion (5.0%), abdominal pain (4.0%), lost strings (6.0%), and menstrual problems or

bleeding (9.0%) are within the range reported in the literature.(29, 30) These complications, while relatively low, highlight the importance of post-insertion follow-up and counselling to address and manage potential issues. The observation that 80.0% of expulsions occurred within a week after insertion suggests that early post-insertion monitoring is crucial. Early expulsion is a known phenomenon, and understanding the timing can guide healthcare providers in determining the appropriate duration and intensity of post-insertion care and education.(31) The remaining 20.0% reporting expulsion between one and six weeks indicates the need for sustained vigilance and communication with patients during the initial post-insertion period. Extended follow-up and clear communication regarding signs of expulsion are essential for addressing delayed complications.(32) The findings emphasize the importance of comprehensive pre-insertion counselling to manage patient expectations and minimize anxiety. Clear communication about potential complications, their likelihood, and strategies for addressing them is critical. Post-insertion counselling should also include guidance on recognizing and reporting complications, especially expulsion. Early detection and timely intervention can contribute to better outcomes and patient satisfaction.(33)

The finding that expulsion of PP-IUCD was significantly associated with increasing age is intriguing. This age-related association suggests that older women may have unique anatomical or physiological factors influencing expulsion rates. Age-related differences in uterine tone, involution, or the healing process after childbirth may contribute to the observed association.(34) Further research is warranted to explore the mechanisms underlying this age-dependent variation in expulsion rates. The higher rate of expulsion among multiparous women (16.7%) compared to primiparous women is a significant finding. This aligns with existing literature suggesting that women with a history of multiple pregnancies may have alterations in uterine anatomy or tone that affect IUCD retention.(35) Multiparity has been associated with increased uterine size and laxity, potentially influencing the likelihood of IUCD expulsion.(36, 37) Recognizing the association between parity and expulsion rates is critical for informing contraceptive counselling and follow-up care.



## Conclusion

This study has provided valuable insights into the acceptance, complications, and associated factors of immediate postpartum intrauterine contraceptive device (PP-IUCD) insertion among a diverse cohort of postpartum women. The acceptance rate of 40.0% highlights the importance of understanding the factors influencing decision-making in this critical postpartum period. The most common reason for refusal was lack of partner consent, emphasizing the need for spousal involvement in family planning discussions. Conversely, the acceptance was driven by a sense of safety and the desire for limited hospital visits, showcasing the significance of perceived efficacy and convenience in contraceptive choices. Complication rates were relatively low, with 74.0% reporting no complications. The significant association between expulsion and increasing age, as well as higher expulsion rates among multiparous women, underscores the necessity for individualized counselling and close follow-up care, especially for older and multiparous individuals. These findings contribute to the existing body of knowledge on PP-IUCD, shedding light on the nuanced interplay of demographic factors, decision-making dynamics, and complication rates in the postpartum population. Healthcare providers should consider these insights when developing tailored family planning interventions and counselling strategies.

As we move forward, further research is warranted to delve deeper into the mechanisms underlying age-related variations in expulsion rates and to explore the long-term satisfaction and continuation rates among PP-IUCD acceptors. Additionally, efforts to address barriers related to partner involvement and to enhance education and communication about postpartum contraceptive options are essential for improving acceptance rates and overall maternal health. In summary, this study contributes valuable data to the field of postpartum contraception, emphasizing the need for personalized and culturally sensitive approaches to family planning. As we continue to advance our understanding, the goal is to promote informed decision-making, enhance the safety and acceptability of contraceptive methods, and ultimately improve the overall reproductive health outcomes for postpartum women.

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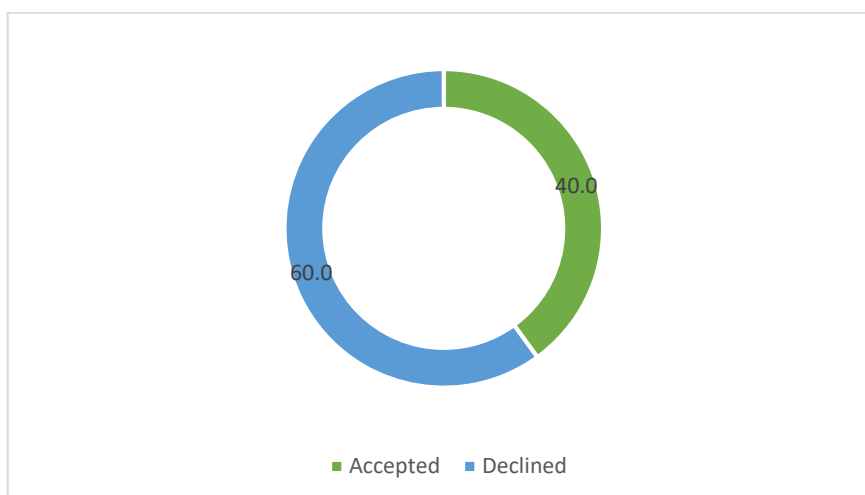


Figure 1: Proportion of women accepting immediate PPIUCD insertion

Table 1: Baseline characteristics of the study participants

Variables		Number (N)	Percentage (%)
Age (in years)	18 to 24	61	61.0
	25 to 29	38	38.0
	30 to 34	1	1.0
Education	Illiterate	2	2.0
	Primary	36	36.0
	Secondary	44	44.0
	University	18	18.0
Socioeconomic status	I	9	9.0
	II	15	15.0
	III	60	60.0
	IV	16	16.0
Religion	Hindu	76	76.0
	Muslim	6	6.0
	Christian	18	18.0
Parity	P1	76	76.0



	P2	24	24.0
Mode of delivery	Normal vaginal	57	57.0
	Instrumental vaginal	4	4.0
	Caesarean section	39	39.0

Table 2: Complications of PP-IUCD insertion

Variables		Number (N)	Percentage (%)
Perception of pain	No pain	56	56.0
	Little pain	22	22.0
	Somewhat pain	18	18.0
	Very painful	4	4.0
Complications	None	74	74.0
	Expulsion	5	5.0
	Abdominal pain	4	4.0
	Lost strings	6	6.0
	Menstrual problem or bleeding	9	9.0
Timing of expulsion	Within 1 week	4	80.0
	1 to 6 weeks	1	20.0

Table 3: Association between complications and age

		18 to 24 N = 61	25 to 29 N = 38	30 to 34 N = 1	P value
Expulsion	Yes	2 (3.3)	2 (5.3)	1 (100)	<0.001*
	No	59 (96.7)	36 (94.7)	0 (0.0)	
Lost strings	Yes	4 (6.6)	2 (5.3)	0 (0.0)	0.831
	No	57 (93.4)	36 (94.7)	1 (100)	
Abdominal pain	Yes	3 (4.9)	1 (2.6)	0 (0.0)	0.936
	No	58 (95.1)	37 (97.4)	1 (100)	
Bleeding or Menorrhagia	Yes	6 (9.8)	3 (7.9)	0 (0.0)	0.901
	No	55 (90.2)	35 (92.1)	1 (100)	

Table 4: Association between complications and parity

		P1 N = 76	P2 N = 24	P value
Expulsion	Yes	1 (1.3)	4 (16.7)	0.002*
	No	75 (98.7)	20 (83.3)	
Lost strings	Yes	3 (3.9)	3 (12.5)	0.124
	No	73 (96.1)	21 (87.5)	
Abdominal pain	Yes	4 (5.3)	0 (0.0)	0.259
	No	72 (94.3)	24 (100)	
Bleeding or Menorrhagia	Yes	6 (7.9)	3 (12.5)	0.491
	No	70 (92.1)	21 (87.5)	





Table 5: Association between complications and modes of delivery

		<b>Normal vaginal</b>	<b>Instrumental vaginal</b>	<b>Caesarean section</b>	<b>P value</b>
		<b>N = 57</b>	<b>N = 4</b>	<b>N = 39</b>	
Expulsion	Yes	5	0	0	0.130
	No	52	4	39	
Lost strings	Yes	3	0	3	0.772
	No	54	4	36	
Abdominal pain	Yes	2	0	2	0.846
	No	55	4	37	
Bleeding or Menorrhagia	Yes	7	0	2	0.391
	No	50	4	37	