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Original Research Article

A cross-sectional study to evaluate the safety and efficacy of post-placental and intra-cesarean insertion of intrauterine contraceptive device

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ABSTRACT

Background: India's growing population necessitates effective postpartum contraceptive methods to reduce unintended pregnancies and to improve reproductive health outcomes. Postpartum intrauterine contraceptive devices (PPIUCDs) offer a reversible, long-term solution, but insertion timing- post-placental or intra-cesarean may affect their safety and efficacy. Objective was to compare the safety and efficacy of post-placental versus intra-cesarean insertion of IUCDs among postpartum women in a tertiary care hospital in Assam, India.
Methods: This prospective observational study enrolled 210 postpartum women from June 2023 to May 2024 at the Fakhruddin Ali Ahmed Medical College and Hospital, Assam. Eligible participants underwent either post-placental or intra-caesarean insertion of CuT 380A IUCDs. Data on demographics, complications, and continuation status were collected at six months post-insertion. Statistical analysis was done using appropriate statistical tests.
Results: Participants' mean age was 28±4.1 years; 79.5% were primipara. Continuation rates of PPIUCD was 77.6%, with 26.4% and 19.3% discontinuing in the post-placental and intra-caesarean groups, respectively. Expulsion rates were higher in the post-placental group (15.4%) compared to intra-caesarean (1.7%) ($p<0.001$). Complications included excessive bleeding, pain, missing thread and expulsion. Factors such as age, parity, and insertion type influenced continuation, with multiparous women and intra-caesarean insertions demonstrating higher retention rates.
Conclusions: Intra-caesarean IUCD insertion is associated with lower expulsion rates and comparable continuation rates compared to post-placental insertion. Addressing social barriers and managing complications can further enhance PPIUCD utilization. These findings can help to design strategies for improving family planning interventions in similar settings.

Keywords: Cesarean section, Family planning, IUCD, Postpartum contraception, Reproductive health

INTRODUCTION

India, now the world's most populous country, faces a pressing need for effective family planning strategies. Family planning is a cornerstone of reproductive health, empowering individuals and couples to make informed decisions about the timing and spacing of pregnancies. Intrauterine contraceptive devices (IUCDs) have emerged as a highly effective, long-acting, and reversible contraceptive option as their failure rate has been estimated to be less than 1 pregnancy per 100 woman-years.[1]

A significant proportion of births In India occur at shorter intervals than recommended, highlighting an unmet need for contraception.[2] In recent years, there has been a growing interest in the use of postpartum IUCDs (PPIUCDs), which are inserted immediately after childbirth. The postpartum period presents a unique opportunity for initiating contraception, as women are

often highly motivated to prevent unintended pregnancies and are already in contact with healthcare providers. World Health Organization's medical eligibility criteria support the use of IUCDs both immediately postpartum and after a four-week delay.[3]

PPIUCDs offer numerous advantages, including addressing the unpredictable onset of ovulation, capitalizing on institutional deliveries, providing long-term, reversible, and highly effective contraception, being coitus-independent and safely insertable immediately after childbirth. However, the timing and method of delivery influence the insertion technique. Post-placental insertion allows for immediate contraception after vaginal delivery, capitalizing on the dilated cervix while intra-cesarean insertion provides direct visualization of the uterine cavity. Despite their efficacy, PPIUCDs are not without potential risks, including expulsion, uterine perforation, and infection.[4] Expulsion rates can vary, and factors such as timing of insertion and individual patient characteristics may influence this risk.[5] Nonetheless, PPIUCDs remain a valuable contraceptive option, particularly in settings with high rates of unintended pregnancies.

This study aims to evaluate the safety and efficacy of post-placental and intra-cesarean insertion of IUCDs in a tertiary care hospital in Assam, India. This study aims to generate evidence-based data to strengthen family planning policies and clinical guidelines on the timing of insertion with least complications and minimal expulsion rates. By addressing these critical issues, this study contributes to the overall goal of improving reproductive health and reducing unintended pregnancies in India.

Objective

To compare the safety and efficacy of post-placental and intra-cesarean insertion of IUCDs. To assess the factors influencing continuation of IUCD inserted in the postpartum period in a tertiary care hospital.

METHODS

The study was a prospective observational study conducted on antenatal women who were admitted for delivery and consented for family planning using PPIUCD. The study was conducted at the department of obstetrics and gynecology, Fakhruddin Ali Ahmed Medical College and Hospital, Barpeta, Assam, India, from June 2023 to May 2024. Ethical approval was obtained from the institutional ethics committee, and informed consent was obtained from all participants.

Eligible pregnant women who met the inclusion criteria, including willingness to participate and commitment to follow-up, were enrolled. Exclusion criteria included severe postpartum haemorrhage, uterine anomalies, gravida ≥3, prolonged rupture of membranes, intrapartum fever, active infections, and patient refusal. A total of 210 eligible women were enrolled in the study based on inclusion and exclusion criteria by complete enumeration method. A specially designed proforma was used to collect data on demographics, medical history, type of insertion, follow-up details, and outcomes. IUCD CuT 380A was inserted immediately post-delivery. It was placed within 10 minutes of placental delivery in women who delivered vaginally and at the uterine fundus prior to closure of the uterine incision for women who underwent caesarean section.

Participants were followed up at six months post-insertion to assess for complications clinical examinations, including pelvic examinations and ultrasound, were performed to evaluate the device's position and integrity. Data analysis was performed using PSPP software. Categorical data was presented as frequencies and percentages, while continuous data was expressed as mean and standard deviation. Chi-square test was used to compare the incidence of expulsion and complication between two methods of IUCD insertion. A p value of <0.05 was considered statistically significant.

RESULTS

The mean age of study participants was 28±4.1 years. The sociodemographic profile of the study participants is enumerated in Table 1.

Table 1: Sociodemographic profile of the study participants.

Age groups (years)	No. of cases	Percentage
20-25	125	59.5
25-30	85	40.5
Education		
Graduate	22	10.5
HSS	81	38.6
Primary	86	41
Uneducated	21	10
Religion		
Christian	8	3.8
Hindu	62	29.5
Muslim	140	66.7

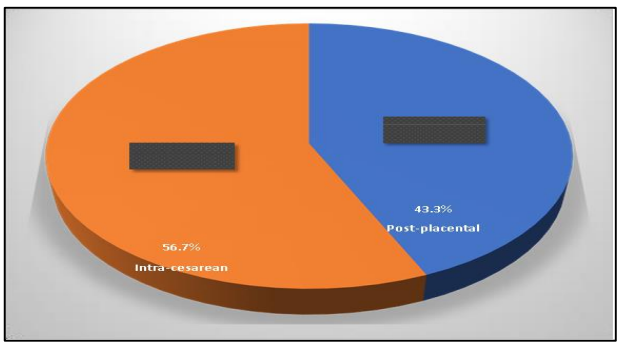

Figure 1: Distribution of cases according to the time of insertion of IUCD.

Table 2: Comparison of continuation status and time of IUCD insertion.

Insertion	Continuation status				Total		Chi-square statistic	P value
	Continuing		Discontinued					
	N	%	N	%	N	%		
Post-placental	67	73.6	24	26.4	91	100	1.474	0.225
Intra-cesarean	96	80.7	23	19.3	119	100		

Table 3: Association between complications and continuation status.

Risk factors	Continuing		Discontinued		P value
	N	%	N	%	
WDPV	10	62.5	6	37.5	0.131
Excessive menstrual bleeding	8	44.4	10	55.6	<0.001*
Missing thread	18	100	0	0	0.017*
Pain abdomen	0	0	7	100	<0.001*
Social factor and myths	0	0	8	100	<0.001*

*Statistically significant.

Table 4: Association between expulsion status and time of insertion.

Type of insertion	Expulsion				Total		Chi-square statistic	P value
	Yes		No					
	N	%	N	%	N	%		
Post-placental	14	15.4	77	84.6	91	100	13.759	<0.001*
Intra-cesarean	2	1.7	117	98.3	119	100		

*Statistically significant.

A majority 167 (79.5%) were primiparous while rest were multiparous. The distribution of intra caesarean and post placental IUCD insertions are enumerated in Figure 1.

At 6 months of follow up 163 (77.6%) had IUCD in place while 47 (22.4%) had discontinued. Among the women who discontinued, in 16 (34.1%) IUCD was expulsed while in 31 (65.9%) IUCD was removed due to complications. We observed age group and parity were significantly associated with continuation status ($p<0.05$-significant) The parity of study participants was significantly associated with continuation status. The comparison of continuation status and time of IUCD insertion is enumerated in Table 2.

The association between complications and continuation status of IUCD is enumerated in Table 3.

Table 4 shows comparison between expulsion status and time of insertion.

None of the study participants reported pregnancy indicating 100% efficacy over 6 months for both the insertion timings.

DISCUSSION

The present study aimed to understand the safety and efficacy of post-placental and intra-cesarean insertion of IUCDs and factors affecting continuation rate of IUCD among post-partum women with a focus on the timing of insertion. The PPIUCD acceptors in our study were in 25-30 years age group. This aligns with the studies of Gupta et al and Doyel et al who observed that higher age was associated with increased PPIUCD acceptance.[6,7] This trend could be attributed to the fact that women in this age range are often more aware of family planning methods and may have already achieved their desired family size. The continuation rate was significantly associated with age group with the older age group showing a better continuation rate of PPIUCD. The finding is in congruence with the findings of Agarwal et al and Chauhan et al.[6,8] The largest group in our study had primary education, although no significant association was observed in continuation rates with respect to educational status. This is a novel finding in our study signifying widespread accessibility and acceptance of this contraceptive method. Most of the women in our study were primiparous. Multiparas demonstrated a notably higher continuation rate (90.7%) compared to primiparas. Similarly, Doyel et al and Dorairajan et al reported in their study that multiparous women have more experience with contraceptive methods and may be better equipped to manage minor side effects.[7,9] We observed high continuation rate (77.6%) in our study which aligns with the findings of Agarwal et al who reported a continuation rate of 76.70% and Chauhan et al observed a continuation rate of 77.7%.[8,10] The discontinuation was predominantly due to removal and the expulsion rate was very low. This is in congruence with

Nalini et al and Shukla et al who also reported a very low expulsion rate in their studies.[11,12] In our study continuation rates were marginally high among the post caesarean group however the difference was not statistically significant. Similarly, Doley et al and Agarwal et al found higher acceptance of PPIUCD among women undergoing caesarean section.[7,10] Excessive menstrual bleeding, missing thread, pain abdomen and social factors were the significant factors resulting in discontinuation. Shukla et al, Nalini et al and Gupta et al also highlighted the same risk factors for discontinuation in their study.[6,11,12] More strikingly, post-placental insertions had significantly higher expulsion rates compared to intra-caesarean insertions. This aligns with findings from Shukla et al. who reported lower expulsion rates in caesarean section deliveries compared to vaginal deliveries. The higher expulsion rates in post-placental insertions compared to intra-caesarean insertions may be attributed to the differences in uterine conditions and insertion techniques between vaginal and caesarean deliveries. No accidental pregnancies were reported in our study demonstrating 100% effectiveness of PPIUCD among the study cohort. The findings align with previous research, including studies by Nalini et al and Dawoud et al which reported similar findings of no pregnancies in their PPIUCD cohorts at follow-up.[11,13]

Though we tried our best to evaluate the safety and efficacy of PPIUCD without biases, certain limitations were unavoidable like being a single centre study may limit its generalizability. Also, study's follow-up period of 6 months, while informative, may not capture long-term continuation rates.

CONCLUSION

In conclusion, while PPIUCD demonstrates promising continuation rates, its success can be further be improved by tailoring counselling and follow-up care based on factors such as age, parity, and cultural background. Addressing complications promptly, managing side effects effectively, and educating communities about IUCD can enhance the acceptability and continuation rates of this contraceptive method. These findings can help to design strategies to strengthen PPIUCD programs and improve reproductive health outcomes.

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Ethical approval: The study was approved by the Institutional Ethics Committee of Fakhruddin Ali Ahmed Medical College and Hospital, Assam with reference number FAAMC&H/IEC_PG/498/2020/4098

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