

**Analysis of Acceptance, Efficacy and Retention Rate of Postpartum Intrauterine Contraceptive Device**

Dr. K.L.Malarvizhi³ MD.DGO.MNAMS., Dr. T.S. Meena¹ MD. DGO. Dr. K.S. Ramya^{2*}, Mr. R. Mothilal⁴ MA. DPS.

³Professor and HOD. ¹Professor, ²Assistant Professor of Department of Obstetrics and Gynecology

⁴Lecturer in Statistics and Demography, Department of Family Welfare

Government Kilpauk Medical College Hospital, Chennai-600 010

Correspondence Author: Dr. K.S. Ramya, MS.DGO, Assistant Professor of Department of Obstetrics and Gynecology Government Kilpauk Medical College Hospital, Chennai-600 010- India.

Conflicts of Interest: Nil

Abstract

Background: Postpartum intrauterine contraceptive device is an effective form of long acting reversible contraception. This study was done to determine the level of acceptance among Indian women according to their socio-demographic profile and to estimate the retention rate of postpartum intrauterine contraceptive device among mothers who accepted Cu T 380A with mode of insertion through vaginal and cesarean section delivery.

Methods: It is a cross sectional prospective study on mothers who were discharged after accepting postpartum intrauterine contraceptive device for the period from 1st April 2013 to 31st March 2014, was conducted during the month of August- October 2017 in tertiary care hospital.

Results: Total number of postpartum mothers who accepted Cu T 380A were 2276 for the year 2013-14. About 332 mothers were taken as random sample and followed up to know the current status of their Cu T insertion. 76.2 % of the mothers were continued Cu T up to 6 months. Only 10.2 % of mothers reported as expulsion of Cu T. 46.6 % of mothers stated Cu T removed for want of childbirth. 25.7 % of mothers stated Cu T was removed due to complications. The mean retention period of PPIUCD was 23.7 months. The Retention Rate of PPIUCD was 44.6 % up to two years.

The maximum period of retention of PPIUCD was about 5 years was found in two cases. 11.1% of mothers only were retained the PPIUCD for the maximum period of 4 to 5 years.

Conclusions: In the present study, the retention rate of postpartum intrauterine contraceptive device in women was 67.8%, 46.4 %, 27.7%, 11.1 % up to one, two, three and four years respectively. About 19.3 % of women stated that they were continuing the PPIUCD at the time of follow up. Women with complications for PPIUCD were found more in Caesarean section (15.3 %) than in women who had delivered vaginally (10.4%). The postpartum intrauterine contraceptive device acceptance and retention rate was found higher in caesarean section delivery than in vaginal delivery. The follow up services of PPIUCD acceptors should be strengthened.

Keywords: postpartum, retention, expulsion.

Introduction

The modern intrauterine contraceptive device is a highly effective, safe, long acting and rapidly reversible method of contraception. According to the 2005-2006 National Family Health Survey, 61% of births in India were spaced less than three years and that 22% of married women had an unmet need for family planning¹. A stratified analysis suggested that 65% of women in the first year postpartum

had an unmet need for family planning². Only 26% of women using any method of family planning during the first year postpartum³.

Although a remarkably low failure rate of less than 1 per 100 women in the first year of use, IUCDs are used by only 2% of current users of contraception in India¹. According to the Sample Registration System Statistical Report 2015, 51.6% of births in Tamilnadu were spaced greater than three years of the birth spacing between current and previous live⁴. After the introduction of JSY, JSSK in India increasing number of women are delivering their babies in hospitals. It allows opportunity to provide PPIUCD in an expandable manner as the women is highly motivated at this time to consider long acting contraceptive methods.

There is a common belief that PPIUCD insertion immediately after delivery is associated with higher expulsion rate. The PPIUCD insertion is done immediately after delivery to reduce maternal mortality rate and infant mortality rate and also to meet the unmet need for family planning. The objective of this study was to estimate the retention rate for PPIUCD in postpartum mothers and to assess the independence of attributes, mode of delivery and continuation of PPIUCD in postpartum mothers who had inserted Cu T 380A before discharge from Government Kilpauk Medical College Hospital in Chennai for the reference period from 1st April 2013 to 31st March 2014.

Methods

The sample survey on postpartum mothers who came for delivery and accepted PPIUCD before discharge from the Government Kilpauk Medical College Hospital, Chennai-10 for the reference period from 1st April 2013 to 31st March 2014 was conducted during the month of August – October 2017. Around 2,267 postpartum mothers were inserted with Cu T 380A for the above said period and

332 mothers were followed and information collected using a survey schedule and the data entered in MS Excel sheet.

The statistical analysis Z test and χ^2 test (chi square) were used and also the statistical tools that proportion, percentage, ratios and measures of central tendency (mean, median) and dispersion (range & standard deviation) were used for discrete and continuous variable in this study. It is an analytical cross sectional study.

Results

Hypothesis - I (Z test)

H0: = 22% of postpartum mothers who had inserted with Cu T 380A retained it up to 2 years

H1: > 22% of postpartum mothers who had inserted with Cu T 380A retained it up to 2 years

Formula: $Z = \frac{p - P_0}{\sqrt{PQ/N}}$

Where p is the proportion stated in the sample, P₀ is the proportion stated in the null hypothesis ; N is the sample size and Q = 1 – P.

Calculation

$p = 154 / 332 = 0.46385$; $P_0 = 22\% = 0.22$

$Z = 0.24385 / 0.0227347 = 10.7258$ and P value = < 0.00001

Result

Since the calculated Z value | 10.7258 | is greater than the table value of 1.64 at (0.05) level of significance, the Null hypothesis may be rejected and the Alternative hypothesis can be accepted that 44.6 % of postpartum mothers retained Cu T up to 2 years is correct and statistically significant at $p < 0.05$.

Hypothesis - II (chi-square test)

H0: The two attributes, mode of delivery and continuance of PPIUCD are independent

H1: The two attributes, mode of delivery and continuance of PPIUCD are not independent.

Table: 1 Continuance of PPIUCD up to 3 years

Mode of delivery	Continuance up to 3 years		TOTAL	Chi-square =8.5057 p-value=0.00354 degrees of freedom = 1
	YES	NO		
LSCS	62	119	181	
Vaginal delivery	30	121	151	
TOTAL	92	240	332	

$$\text{Chi-square} = N \times \frac{(ad - bc)^2}{(a+b)(c+d)(a+c)(b+d)}$$

$$= 332 \times \frac{[(62 \times 121) - (119 \times 30)]^2}{(181 \times 151 \times 92 \times 240)} = 8.5057$$

Result

We may not accept the null hypothesis, since the calculated chi-square (8.5057) is greater than the table value of chi-square (3.84) and hence the two attributes that mode of delivery and continuance of PPIUCD were not independent at the long continuance period of three years and it is statistically significant at $p < 0.05$.

Table: 2 Age group wise PPIUCD Acceptation, Discontinuation and Continuation.

Age Group	No. of Acceptors	%	No. Discontinued	%	No. Continuing	%
15-19	12	3.6	12	3.6	0	-
20-24	154	46.4	127	38.3	27	8.1
25-29	124	37.3	98	29.5	26	7.8
30-34	37	11.2	29	8.7	8	2.4
35-39	5	1.5	2	0.6	3	0.9
40-44	-	-	-	-	-	-
45-49	-	-	-	-	-	-
TOTAL	332	100.0	268	80.7	64	19.3
MEDIAN	25.0		24.8		25.2	

The table 2 shows the PPIUCD acceptance, discontinuance and continuance were given and it reveals that the discontinuance rate and continuance rate were 80.7 % and 19.3% respectively. The median age of acceptance, discontinuance and continuance of PPIUCD were calculated and it was found to 25.0, 24.8 and 25.2 years respectively.

Table 3: Literacy status of PPIUCD Acceptors

Literacy level	Acceptors	%
Illiterate	3	0.9
Up to 5 th Std.	18	5.4
Up to 8 th Std.	70	21.1
9 th & 10 th Std.	22	6.6
Plus 2	158	47.6
Graduates	37	11.2
Post graduates	14	4.2
Diploma	10	3.0
Total	332	100.0

Table 3 shows the literacy level of PPIUCD Acceptors at the time of Cu T insertions. It reveals that 99.1 % had at least primary education, 47.6% had Higher Secondary education, 36.1% had Primary education which includes primary, middle and SSLC level and 15.4% had Higher education.

Table 4 Spatial Distribution of PPIUCD Acceptors

Residence	Acceptors	%
Rural	72	21.7
Urban	260	78.3
Total	332	100.0

The table 4 shows the spatial distribution of PPIUCD Acceptors. It shows that urban areas women were more accepted PPIUCD than in rural areas women and it was 78.3% and 21.7% respectively.

Figure 1: No. of Living children at the time of insertion

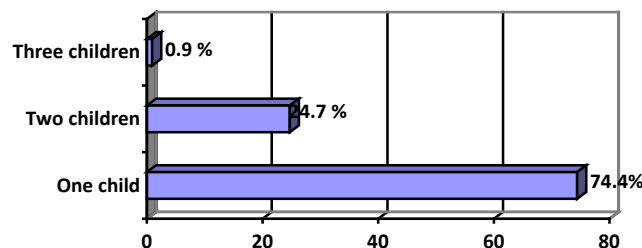


Figure 1 shows the women who had accepted PPIUCD with the number of living children at the time of Cu T 380A insertion. It reveals that 3/4th of the mothers had inserted Cu T 380A with one child and the rest of them inserted Cu T 380A with multi children immediately after the delivery.

Figure 2: Religion wise PPIUCD Acceptors

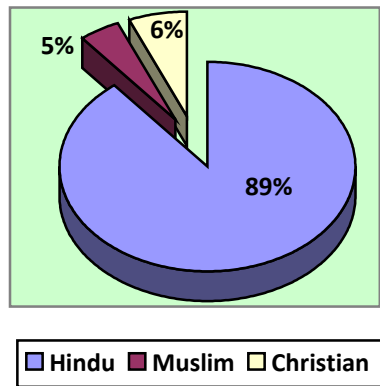


Figure 2 shows the religion wise PPIUCD Acceptors. It reveals that Hindu religious women had accepted more PPIUCD followed by other religious and it was 9:1 ratio.

Table 5: Reasons for removal of Cu T 380A

Reasons	Nos.	%
Want of Child birth	125	46.6
Complications	69	25.8
To accept other methods	25	9.3
Family problems	2	0.8
Any other reasons	47	17.5
Total	268	100.0

The table 5 shows the various reasons for removal of Cu T 380A. Nearly 80% of the PPIUCD acceptors were removed Cu T 380A and most of them removed Cu T 380A for want of child birth (46.6%), due to complications (25.8%), to adopt other FP methods (9.3%), Parter and family refusal (0.8%) and other reasons (17.5%).

Table 6: Mode delivery and Acceptance, Removal, Expulsion, Discontinued and continued.

Mode of delivery	Accepted	Removed	Expelled	Discontinued	Continued	Percentage		
						Accepted	Discontinued	Continued
LSCS	181	127	15	142	39	54.5	42.7	11.8
Vaginal	151	107	19	126	25	45.5	38.0	7.5
Total	332	234	34	268	64	100.0	80.7	19.3

According to the Table 6, PPIUCD accepted by mothers who had delivered through in caesarean section and vaginally was 54.5% and 45.5% respectively. Totally 80.7% of them discontinued where in about 10% were due to expulsion of Cu T 380A. It shows that proper follow up services were not given to the PPIUCD acceptors clinically. Only 19.3% were stated that they had continued the PPIUCD at the time of interview with them. The discontinuation rate and continuation rate were higher in caesarean section than in vaginal deliveries. 42.7% mothers who had given birth with LSCS discontinued PPIUCD whereas their PIUCD continuation rate was 11.8%. Similarly, it was 38.0% whereas the continuation rate was 7.5% in vaginal deliveries.

Figure 3: Expulsion Rate of PPIUCD

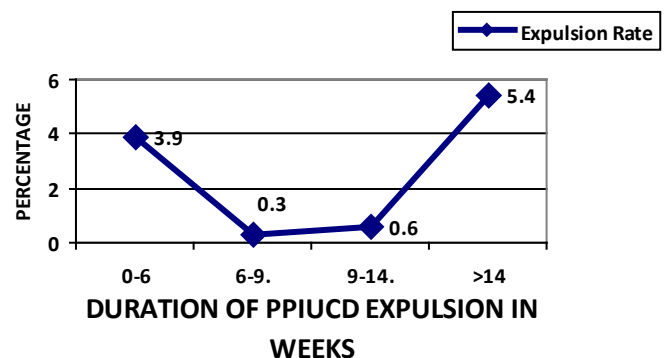


Figure 3 shows that the Cu T 380A expulsion period and its rates. It reveals that nearly 4% of the PPIUCD expulsion was made within the first 6 weeks of insertion and 10.2% mothers were discontinued the PPIUCD due to expulsion of Cu T 380A. This shows that lag of follow up services as well as the in negligence of the insertions. The

Service Providers should monitor the follow up services of PPIUCD Acceptors to reduce the expulsion rate.

Table 7: Number of PPIUCD Acceptors with Retention Period.

Mode Of Delivery	Total Ppiucd Acceptors	Number Retained UP To The Period Among Removed And Continued Ppiucd Acceptors										
		Two Weeks	One Month	Six Weeks	Three Months	Six Months	One Year	Two Years	Three Years	Four Years	4.5 Year	After
LSCS	181	172	168	163	157	141	125	91	62	24	2	0
VAGINAL	151	145	137	137	129	112	100	63	30	13	0	0
TOTAL	332	317	305	300	286	253	225	154	92	37	2	0
Retention Rate (%)	95.5	91.9	90.4	86.1	76.2	67.8	46.4	27.7	11.1	0.6	-	-

The table 7 shows the number of PPIUCD acceptors with their retention period. It reveals that 95.5% were continued the PPIUCD up to two weeks and 4.5% of them not continued at least two weeks from date of acceptance. The retention rate of PPIUCD Acceptance were given at various interval periods as shown in the above table 7 and it is noted that the retention rate was gradually decreased up to six weeks from the date of insertions and then started in decreasing trend up to 4 years. The maximum retention rate was found in up to two weeks (95.5%) minimum at four years (11.1%). The average retention rate of PPIUCD was 46.4%.

Table 8: Number of Mothers and PPIUCD Retention period.

Retention Period (in months)	No. of mothers	Retention Period (in months)	No. of mothers
0-6	79	30-36	23
6-12	28	36-42	20
12-18	30	42-48	35
18-24	41	48-54	35
24-30	39	54-60	2

The table 8 shows the number of PPIUCD acceptors and their duration of keeping Cu T 380A. From the above table 11, mean retention period was calculated and it was

found to 23.7 months where the retention rate was estimated as 46.4 % approximately.

Discussion

In present study, majority of the women were in the age group 20-29 years (83.7%). Their median age was 25 years (SD \pm 3.77); the time for the settlement of both career and family so they accepted PPIUCD as an effective method of birth spacing. Mwinyi Ali RA found that mean age of PPIUCD acceptors was 27.6 years (SD \pm 5.68)⁵. Shivani Barala et al found that majority of women were in the age group 20-29 years (77.8%), their mean age was 24.16 years (SD \pm 2.16)⁶.

In present study, majority of the women (99.1%) had at least primary level education. Acceptance of PPIUCD was higher among women with secondary, primary education (47.6, 36.1% respectively) than those with no formal education (0.9%). This finding confirms importance of education in deciding future pregnancy. Higher education women (15.4%) had lower acceptance of PPIUCD as they have easy access to other methods of contraception like condoms, OCPs and permanent sterilization. This was similar to a study done in India by Barala S et. Al where women with no formal education had acceptance of 28%, while those with higher education 27%, primary 40.3% and secondary education 32.8%⁶. Egypt by Safwat et al. Where women with no formal education had an acceptance of 9.4%, while those with formal education was 19.4%⁷.

During this study, it is seen that the acceptance rate of PPIUCD was higher among urban women (78.3%) as compared to rural women (21.7%). This is because the women of rural areas rely on other methods of contraception like OCPs, condoms, permanent sterilization. It was also cleared from the study that lag of proper information and motivation lead to small acceptance of PPIUCD among rural woman. Katheit G et

al found that the acceptance of PPIUCD was almost equal in rural (47.6%) and urban women (52.4%)⁸.

In the present study, 1/4th of the women (25.6%) who accepted PPIUCD had 2 children (24.7%) and 3 children (0.9%) as they want some long term or permanent method of contraception contrary to permanent sterilization. This was similar to the study done by Katheit G et al where they found 35.76% of the women were para-2 who accepted PPIUCD⁸. Grand multiparous women had lower acceptance of PPIUCD in our study because they wanted permanent sterilization.

In the present study, a significant number of women (46.6%) removed PPIUCD because of want of child birth followed by complications (25.7 %). About 26.5% of the PPIUCD acceptors had delivered a baby after the removal of PPIUCD and accepted terminal method. 5.6% of them accepted other temporary method. A few of them (0.7%), less than one percentage removed PPIUCD because of family refusal and partner. This reveals the importance of partner involvement during counseling and decision making. Many studies have shown that when the partner is involved in contraceptive counseling and decision making, the acceptance and continuation rates were higher. Unfortunately in our setup women who visit the antenatal clinic are usually not accompanied by their partners and therefore couple counseling is lost during this period. Furthermore, during the short postpartum period, partners usually come in contact with their spouses during discharge which is not appropriate for counseling. If the partners fail to agree on the method, or do not know how to use it well, even highly effective method will not be used well. Therefore, this is a good reason for including both partners when helping a couple to choose a contraceptive method which will also increase the compliance. In the Africa postpartum study done by FHI, husbands' desires for IUCD removals was a significant

reason for removal, emphasizing the importance of involving the husband in prenatal counseling⁹. Similar results were obtained in the study done by Mishra S, Bolangir, Odisha, India where one of the main reason for refusal of PPIUCD was partner and family refusal (50.28%)¹⁰.

In the present study, the expulsion rate of PPIUCD at 6 weeks follow up was 3.9%. In the study done by Mishra S, Bolangir, Odisha, India expulsion rate was 8.29% at 4 weeks follow up¹⁰. In a multi country study done in Belgium, Chile and Philippines the expulsion rate at 1 month ranges from 4.6 to 16%¹¹. Expulsion rate of PPIUCD in a study done in China by Chi et al in 1994 was 9.5-12.5%¹².

A study was done by the Directorate of Family Welfare, Chennai-6 to know the Retention rate of PPIUCD in TamilNadu was 90.1%, 78.7%, 63.6%, 49.2% and 21.9% in respect of less than one month, up to 3 months, 6 months, 12 months and 24 months interval period¹³. In the present study, the Retention rate of PPIUCD was found that 91.9%, 86.1%, 76.2%, 67.8%, 46.4%, 27.7%,11.1% and 0.6% in respect of the interval period of up to one month, up to 3 months, 6 months, 12 months, 24 months, 36 months, 48 months and up to 54 months respectively.

Conclusion

In the present study, the retention rate of postpartum intrauterine contraceptive device in women was 67.8%, 46.4 %, 27.7%, 11.1 % up to one year, two years, three years and four years respectively. The postpartum intrauterine contraceptive device acceptance and retention rate were found higher in Cesarean section delivery than in vaginal delivery. In the present study, the Retention rate of PPIUCD Acceptance up to 2 years was found as 46.4 % and it was proved statistically significant at $p < 0.05$. The attributes that mode deliveries and

continuance of PPIUCD were not independent at long run of retention of PPIUCD say 3 years and also it was statistically significant at $p < 0.05$. Women had complications for PPIUCD was found more in Caesarean section (15.3 %) than in women who had delivered vaginally (10.4%). About 80.7% were discontinued PPIUCD where in about 10% was due to expulsion of Cu T 380A. In the expulsion, nearly 4% of them was within the first 6 weeks of insertion of Cu T 380 A. It indicates that the follow up services was given to the acceptors of PPIUCD was not up to the level and it should be strengthened.

The mean retention period of PPIUCD by mothers was found that 23.7 months and hence the Retention rate of PPIUCD among them was estimated as 46.4% approximately. About 19.3 % of women stated that they were continuing the PPIUCD at the time of interview.

The maximum period of retention of PPIUCD by mothers about 5 years was found in 2 cases. 11.1% mothers only were retained the PPIUCD for the maximum period of 4 to 5 years. The mothers who had inserted Cu T 380A with one child was 74.4% in this study. It shows the use effectiveness of Cu T 380A insertions was made to mothers of parturition.

Acknowledgements

Our sincere thanks to Dr. Banuppavitra K., Anusya, Haripriya, Dr. Harish S.P., Janakiraman, Lokesh, Jeevadurai, Jeevanandam and Murali CRRI medical Student and Dr. Janani Post graduate medical student for extending their cooperation for follow up services and obtained information from them using the survey schedules and to Miss. Meerabhai ANM and Mrs. Amudha RMNCH Counsellor of Postpartum Partum Centre, for providing the PPIUCD registers for taking sample cases at the Family Planning Clinic, Government Kilpauk Medical College Hospital, Chennai-600010.

References

- [1]. International Institute for Population Sciences (IIPS) and Macro International: National Family Health Survey (NFHS-3), 2005-06, India, Key Findings. Mumbai, IIPS, 2007. In Accessed at <http://www.measuredhs.com/pubs/pdf/SR128.pdf> on March 14, 2013.
- [2]. Borda M. Family Planning Needs during the Extended Postpartum Period in India. Access Family Planning Initiative Brief, 2009. In Accessed at http://www.accesstohealth.org/toolres/pdfs/India_Analysis.pdf, on March 14, 2013.
- [3]. Post-partum IUCD reference manual; Family Welfare, Govt. of India. 2010; 1:2.
- [4]. Registrar General of India, GOI. In: Statistical Report 2015, Sample Registration System. Available from: http://www.censusindia.gov.in/vital_statistics/SRS_Reports_2015.html.
- [5]. Mwinyi Ali RA. Acceptability and safety of postpartum intrauterine contraceptive device among parturients at Muhimbili National Hospital, Tanzania. [muhas.ac.tz:8080/.../Error free dissertation PPIUCD.pdf](http://www.muhas.ac.tz:8080/.../Error_free_dissertation_PPIUCD.pdf). Muhimbili University of Health Sciences, Tanzania.
- [6]. Barala S et al. Analysis of awareness, acceptance, safety and continuance rate of postplacental and intra-caesarean insertion of intrauterine contraceptive device, Int J Reprod Contracept Obstet Gynecol. 2016 June; 5(6): 1974-1980.
- [7]. Safwat A Mohamed Momen A, Kamel Omar M, Shaaban HT, Salem. Acceptability for the use of Postpartum Intrauterine Contraceptive Devices: Assuit Experience, Medical Principles and Practice. 2003;12:170-5.
- [8]. Katheit G, Agarwal J. Evaluation of PPIUCD in terms of awareness, acceptance and expulsion in a tertiary care

center. *Int J Reprod Contracept Obstet Gynecol.* 2013; 2:539-43.

[9]. Redmond MA. Couple-directed contraceptive counseling, *Canadian Nurse.* 1982;78(8):38-9.

[10]. Mishra S. Evaluation of Safety, Efficacy and Expulsion of Post-Placental and Intra-Caesarean Insertion of Intrauterine Contraceptive Devices(PPIUCD). *The Journal of Obstetrics and Gynecology of India,* 2014; 64(5):337-43.

[11]. Blanchard H Mac Kaig C. ACCESS-FP Program. 2006. Postpartum contraception. http://www.k4health.org/sites/default/files/postpartumabortion_English.pdf.

[12]. Chi IC. Postpartum IUD insertion: timing, route, lactation and uterine perforation. In: c.WayneBardin, Daniel R. Mischell, Jr editor(s). *Proceedings from the Fourth International Conference on IUDs.* Boston: Butterworth-Heinemann. 1994:219-27.

[13]. The Directorate of Family Welfare, Chennai-6. Findings of PPIUCD Study in Tamil Nadu. In accessed at <http://www.tnhealth.org/dfw/dfwotherpub.php> on October 2017.