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Original Research Article

Factors associated with removal of postpartum intrauterine contraceptive device among acceptors in rural areas of Nadia district, West Bengal: a case-control study

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ABSTRACT

Background: The unmet need for contraception remains high in the postpartum period. Postpartum intrauterine contraceptive device (PPIUCD), despite being an effective and well-suited contraceptive method for this period, many women discontinue its use due to various reasons just after a few days or weeks. The study aimed to identify the factors associated with the removal of the same.
Methods: A community-based case-control study had been conducted in Nadia district of West Bengal. A multi-stage sampling technique had been applied to identify and interview the cases and controls with the help of a predesigned pretested semi-structured schedule.
Results: The overall removal and expulsion rates were found to be quite high (21.5% and 16.3% respectively). Multivariate analysis revealed that acceptors belonging to joint family, educated only up to middle level, if place of delivery and insertion of PPIUCD was BPHC, the same had been inserted by nursing staff, experienced pain after insertion, not given consent before insertion, not counselled ever on PPIUCD, not decided to accept PPIUCD before delivery, not satisfied with its use and undergone no follow up visit after its insertion, were having higher odds of removal of the same.
Conclusions: Rigorous counselling during the antenatal period should be focused to achieve a declining trend regarding PPIUCD removal.

Keywords: Case-control, Factors, Postpartum intrauterine contraceptive device, Removal, Rural, West Bengal

INTRODUCTION

India was the first country in the world to have launched a National Programme for Family Planning in 1952. Despite this fact, with a population of over 1.2 billion, it is expected to become the world's most populous country, in less than one and a half decade.[1] Family planning has a pivotal role not just in population stabilization but also in many important developmental issues like improvement of maternal and child health.[2] Too early, too many and too frequent pregnancies are important risk factors for maternal and child mortality and morbidity.[3] In India, approximately 27% of births occur in less than 24 months after a previous birth, another 34% of births occur between 24 and 35 months and 61% of births occur within the recommended birth spacing of approximately 36 months.[4] Over the decades, the national programme has undergone progress towards its goal and now according to NFHS-4 (2015-16) the total fertility rate (TFR) of the country has recorded a steady decline to the current levels of 2.2; yet the total unmet need of family planning stands at 12.9% and the unmet

need for spacing at 5.7%.[5] The key thrust tactics for population stabilization in India include to provide a wide variety of choices for contraceptives with newer initiatives in spacing like postpartum intrauterine contraceptive device (PPIUCD) in order to capitalize the opportunity provided by increased institutional deliveries.[6]

IUCD inserted within the 48 hours of delivery are known as postpartum intrauterine contraceptive device.[7] PPIUCD has been launched in the national family welfare programme in march 2010.[8] Despite being a cost-effective and relatively convenient contraceptive, PPIUCD is still not a preferred method of contraception among the acceptors due to various reasons.[6] Researches had been conducted to enlighten on this issue, yet there is scarcity of explorative studies specifically in West Bengal.[1,6] The current study had been framed with the aim to identify the factors associated with removal of PPIUCD among the acceptors in rural areas of Nadia district, West Bengal.

METHODS

A case-control study had been conducted in Nadia district of West Bengal between March 2019 to July 2019. Ethical clearance had been obtained from institutional ethics committee. The study population consisted of mothers who delivered at government institution in the study area and accepted PPIUCD at least 6 months prior to the date of the data collection. Mothers not giving consent, suffering from physical or mental illness, residing in urban areas of the district or delivered at private hospitals or home or in any institution (government/ private) outside the study area were excluded from the study. The case had been defined as mother delivered at government institution of the study area, accepted PPIUCD at least 6 months prior to the date of data collection and removed it voluntarily within 6 months and those who had not removed it voluntarily within 6 months of insertion were considered as controls.

Sample size had been calculated with software Epi info for unmatched case control study with the following assumptions: two-sided confidence interval of 95%, p value significance at <0.05, power at 80%, case to control ratio as 1:4 and proportion of controls and cases exposed to one major predictor of removal of PPIUCD (lack of counselling as found in pilot study) to be of 30% and 56.25% respectively.[9] Pilot study findings had been used to calculate the sample size which had been conducted before commencement of the original study. Thus, the required cases and controls were 33 and 133 respectively with a total sample size of 166.

Multistage sampling technique had been applied to collect the samples. One subdivision was selected randomly out of four such in Nadia district. Then four blocks were selected randomly out of seven blocks of the selected subdivision and four sub-centres were selected randomly from each block i.e. a total of 16 subcentres were included in the study. Three cases and nine controls were planned to be taken from each sub-centre. Two separate sample frames were considered for PPIUCD removal and PPIUCD non-removal groups. These frames had been prepared by line listing of women who had been inserted with PPIUCD in the month of September and October 2018 of that particular sub-centre including their present status of PPIUCD (continuation/ spontaneous expulsion/ voluntary removal) with the help of RCH registers and the local staffs. From this frame, required number of cases and controls were selected randomly.

A face to face interview by house to house visit had been conducted with a questionnaire. The questionnaire was first prepared in English. Then it was translated into Bengali by a linguistic expert keeping semantic equivalence. To check the translation, it was re-translated into English by two independent researchers who were unaware of the first English version. Face validity of each item had been checked from previous researches in the presence of public health experts. They also decided the content validity of each domain. Reliability was checked by test-retest method (r=0.9). Pretesting followed by pilot testing was conducted. Necessary corrections and modifications of the questionnaire were done accordingly.

Statistical analysis

Data thus collected had been entered in MS Excel and analyzed subsequently in SPSS 20.0 version using descriptive and inferential statistics. Associations between dependent and independent variables were checked through Chi-square or Fisher's Exact test whichever was applicable. Odd's ratios were calculated to find out the strength of association. All the independent variables having statistically significant association with dependent variable were included in multivariate analyses. All analyses were two tailed with $p \leq 0.05$ considered statistically significant. Modified B. G. Prasad scale (2018) had been used to classify socio-economic status of the participants.[10]

RESULTS

Majority (71.5%) of the acceptors belonged to the age group of 15-25 years with the median age of 22 (19-25) years, Hindu (59.3%) religion, general caste (74.4%) and joint family (73.3%). Most of them (61% and 52.3%) had only one living child and at least one living male child respectively. Regarding educational background, most of the mothers were educated up to middle level (31.4%) and majority of their husbands had passed the primary standard (30.8%). According to the modified B. G. Prasad scale (2018) for socio-economic class, majority of the families belonged to class I (45.5%) followed by class IV (21.3%). Nearly all the acceptors (92.4%) were home-makers and majority (40.7%) of their husbands were

found to be engaged in non-agricultural labour work followed by small businesses (26.2%).

Table 1: Distribution of cases according to facts related to removal (n=37).

Variables	Frequency (n)	Percent (%)
Time of removal		
Within 1 month of insertion	3	8.1
1-2 months of insertion	9	24.3
2-3 months of insertion	8	21.6
3-4 months of insertion	5	13.5
4-5 months of insertion	6	16.2
5-6 months of insertion	6	16.2
Causes of removal*		
String is hurting/missing	9	24.3
Uncomfortable to wear	10	27.0
Fear	11	29.7
Menstrual problem (pain/bleeding disturbances)	10	27.0
Other health problems	12	32.4
Desire for other FP methods	3	8.1
Wish for pregnancy	1	2.7
Restriction of activity in day to day life	5	13.5
Place of removal was same as that of the insertion?		
Yes	2	5.4
No	35	94.6
Place of removal		
Home (herself/untrained dai/nurse)	10	27.0
BPHC	2	5.4
Subcentre	2	5.4
Private clinic/nursing home	23	62.2
*Multiple responses.		

Majority (62.2%) of the participants were found to be continuing their PPIUCD whereas 16.3% had spontaneous expulsion and 21.5% had their PPIUCD removed.

It had been found that majority of removals took place within 3 months of insertion (54%) followed by 4-6 months of insertion (32.4%) with a mean removal time of 101.19 (48.95) days, minimum of 7 days and maximum 180 days. Main reason for removal was health problems (59.4%) including menstruation related problem, lower abdominal pain or other general health problems; while other significant reasons for removal were fear related to PPIUCD/IUCD (29%), inconvenience due to it or restriction in day to day life (cumulatively 40.5%) and issues related to string (24.3%). Only 2.7% of removal were desired due to wish for pregnancy and only 8.1% of removal was desired for switching to other family planning method. Majority of removals had taken place in some private clinic or nursing home (62.2%) followed by at home by herself or with the help of untrained dai or nurses (27%) (Table 1).

Table 2: Distribution of samples according to facts related to expulsion (n=28).

Variables	Frequency (n)	Percent (%)
Have you sought for reinsertion after expulsion?		
No	28	100
Causes of not willingness of reinsertion*		
Other methods preferred	20	71.4
Health problems	11	39.3
Uncomfortable to wear/ restriction of activity due to it	7	25
Fear	5	17.9
Not discussed yet with husband	1	3.6
Time of expulsion		
Within 1 month of insertion	21	75.0
1-2 months of insertion	2	7.1
2-3 months of insertion	1	3.6
3-4 months of insertion	0	0
4-5 months of insertion	2	7.1
5-6 months of insertion	2	7.1

*Multiple responses.

All the respondents those who experienced expulsion of it never asked for reinsertion. Majority of them (71.4%) reported the reason for their unwillingness of reinsertion as preference for other family planning method. Other did not want reinsertion due to health problem faced (39.3%), discomfort or restriction in day to day life (25%) and excessive fear of it (17.9%). Three forth of the spontaneous expulsions occurred within one month of insertion with a mean expulsion time of 40.36 (53.67) days, minimum of 1 day and maximum of 180 days (Table 2).

Regarding medical complication related to PPIUCD insertion, pain was experienced in only 18.1% of the respondents during PPIUCD insertion. But this percentage raised to 54% when they were asked that whether they experienced pain due to it ever after its insertion. Majority (76.7%) of them reported some or the other health complication after commencement of its use. Majority (54.5%) experienced problem related to menstruation, followed by 26.5% reporting lower abdominal pain and occurrence or exaggeration of leukorrhea (15.2%). But, only 25.6% seek any medical assistance for their health issues (Table 3).

Majority (86.6%) reported that consent had not been taken before insertion of PPIUCD. Only 32% of mothers in the sample consented that they ever had some counselling regarding PPIUCD. Among them 98.2% were counselled by ASHA during their ANC period (89.1%). Majority (27.3%) received counselling more

than six times before insertion of PPIUCD. However, among those who were counselled only 36.4% were satisfied with the counselling on PPIUCD. Majority (79.7%) were not able to take decision regarding its use prior to its insertion. Among those who took prior decision of its use, majority (74.3%) took the decision during ANC period. Those who chose PPIUCD as their method of family planning, they wanted it because it provides freedom from being pregnant (34.3%), it is safer than other family planning methods (28.6%) and it provides long term protection/ spacing (28.6%).

Table 3: Distribution of study population according to medical complication before or after PPIUCD insertion (n=172).

Variables	Frequency (n)	Percent (%)
Pain during insertion		
No pain at all	141	82
Mild	18	10.5
Very much	13	7.6
Pain after insertion		
No pain at all	79	45.9
Mild	57	33.1
Very much	36	20.9
Any other complication afterwards		
Yes	132	76.7
No	40	23.3
Specification of problem afterwards (n=132)*		
Menstrual problem	72	54.5
Leucorrhoea	20	15.2
Lower abdominal pain	35	26.5
Other health related problem	15	11.4
Painful intercourse	11	8.3
Seek medical help for problems (n=132)		
Yes	44	25.6
No	128	74.4

*Multiple responses.

Only 40.7% of the PPIUCD acceptors reported satisfaction with its use. Other were not satisfied. The major reasons for dissatisfaction was health problem faced or possible health effects due to its use (51%) followed by inconvenience in day to day life (44.1%). Fear of unknown side effect was also a significant reason of dissatisfaction (25.5%). Follow up visit was observed in 27.3% of PPIUCD acceptors with majority (57.4%) had that only once and satisfaction with follow up visit was noted in only 19.1% of them (Table 4).

Regarding factors associated with removal of PPIUCD, multivariate analysis revealed that acceptors belonging to joint family, educated only up to middle level, if place of delivery and insertion of PPIUCD was BPHC, the same had been inserted by nursing staff, experienced pain after insertion, not given consent before insertion, not counselled ever on PPIUCD, not decided to accept PPIUCD before delivery, not satisfied with its use and undergone no follow up visit after its insertion, were having higher odds of removal of the same (Table 5).

Table 4: Distribution of study population according to counselling and decision making regarding PPIUCD (n=172).

Variables	Frequency (n)	Percent (%)
Consent taken before insertion		
Yes	23	13.4
No	149	86.6
Ever counselled on PPIUCD		
Yes	55	32
No	117	68
Who counselled? * (n=55)		
ASHA	54	98.2
ANM	1	1.8
Nurse	2	3.6
Others/ Designation not known	5	9.1
When counselled? * (n=55)		
ANC	49	89.1
At the time of delivery	7	12.7
Other time	1	1.8
How many times counselling done? (n=55)		
1	6	10.9
2	6	10.9
3	8	14.5
4	9	16.4
5	2	3.6
6	9	16.4
>6	15	27.3
Satisfied with counselling (n=55)		
Yes	20	36.4
No	35	63.6
Who took decision of PPIUCD?		
No decided prior to insertion	137	79.7
Husband wife jointly	17	9.9
Wife	17	9.9
Husband	1	0.6
Timing of decision making (n=35)		
ANC	26	74.3
During delivery	4	11.4
Other times	5	19.2
Reasons for choosing PPIUCD over other methods during decision making* (n=35)		
Freedom from fear of being pregnant	12	34.3
Safer than other methods	10	28.6
Forget to take OCP regularly	4	11.4
To try it for the first time	2	5.7
Other family member also accepted	2	5.7

Variables	Frequency (n)	Percent (%)
Provides long term protection/ spacing	10	28.6
Satisfied after using PPIUCD		
Yes	70	40.7
No	102	59.3
Reasons for dissatisfaction* (n=102)		
Fear due to unknown side effects	23	22.5
Possible health effects	26	25.5
String is hurting	15	14.7
Uncomfortable to use it in day to day life	45	44.1
Menstrual problem	26	25.5
Problem in sexual intercourse	10	9.8

Variables	Frequency (n)	Percent (%)
Follow up visits after insertion		
No	125	72.7
Yes	47	27.3
Number of follow up visits (n=47)		
1	27	57.44
2	14	29.79
3	3	6.38
4	1	2.13
5	1	2.13
7	1	2.13
Satisfied with follow up visits (n=47)		
Yes	9	19.1
No	38	80.9

*Multiple responses.

Table 5: Factors related to removal of PPIUCD (n=172).

Variables	Removal		Test of significance	OR (95% CI)	AOR (95% CI)
	Yes n (%)	No n (%)			
Age (in completed years)					
≤ 22 (median)	22 (22.7)	75 (77.3)	$\chi2$=0.180, df=1, p=0.671	1.173 (0.560-2.456)	-
>22	15 (20.0)	60 (80.0)			
Religion					
Muslim	21 (30.0)	49 (70.0)	$\chi2$=5.037, df=1, p=0.025	2.304 (1.100-4.823)	1.708 (0.619-4.711)
Hindu	16 (15.7)	86 (84.3)			
Caste					
Others	15 (34.1)	29 (65.9)	$\chi2$=5.541, df=1, p=0.019	2.492 (1.149-5.405)	2.204 (0.708-6.860)
General	22 (17.2)	106 (82.8)			
SES					
III, IV, V	33 (22.1)	116 (77.9)	Fisher's Exact test, p=0.787	1.351 (0.430-4.248)	-
I and II	4 (17.4)	19 (82.6)			
Total no of living children					
≤1	29 (26.6)	80 (73.4)	$\chi2$=4.573, df=1, p=0.032	2.492 (1.060-5.858)	1.846 (0.606-6.5.621)
>1	8 (12.7)	55 (87.3)			
Total no of living male children					
≤1	36 (22.8)	122 (77.2)	$\chi2$=1.864, df=1, p=0.172	3.836 (0.485-30.329)	-
>1	1 (7.1)	13(92.9)			
Type of family					
Joint	33 (26.2)	93 (73.8)	$\chi2$=6.109, df=1, p=0.013	3.726 (1.240-11.191)	2.747 (1.710-10.630)
Nuclear	4 (8.7)	42 (91.3)			
Education of wife					
Up to middle level	28 (27.2)	75 (72.8)	$\chi2$=4.894, df=1, p=0.027	2.489 (1.092-5.675)	3.379 (1.133-10.077)
Secondary and above	9 (13.0)	60 (87.0)			
Education of husband					
Up to middle level	25 (20.2)	99 (79.8)	$\chi2$=0.480, df=1, p=0.488	0.758 (0.345-1.664)	-
Secondary and above	12 (25.0)	36 (75.0)			
Type of delivery					
Vaginal	24 (28.6)	60 (71.4)	$\chi2$=4.847, df=1, p=0.028	2.308 (1.084-4.912)	1.530 (0.390-7.250)
Caesarean	13 (14.8)	75 (85.2)			
Place of delivery					
BPHC	11 (37.9)	18 (62.1)	$\chi2$=5.570, df=1, p=0.018	2.750 (1.161-6.512)	2.331 (1.020-9.664)
DH, SDH, MC	26 (18.2)	117 (81.8)			

Variables	Removal		Test of significance	OR (95% CI)	AOR (95% CI)
	Yes n (%)	No n (%)			
Place of PPIUCD insertion					
BPHC	11 (39.3)	17 (60.7)	$\chi2$=6.258, df=1, p=0.012	2.937 (1.231-7.004)	1.780 (1.013-10.114)
DH, SDH, MC	26 (18.1)	118 (81.9)			
Designation of PPIUCD inserter					
Nurse	25 (20.1)	58 (69.9)	$\chi2$=7.041, df=1, p=0.008	2.766 (1.283-5.962)	2.769 (1.200-38.367)
Doctor	12 (3.5)	77 (86.5)			
Pain during insertion					
Yes	11 (35.5)	20 (64.5)	$\chi2$=4.372, df=1, p=0.037	2.433 (1.040-5.691)	1.364 (0.367-4.954)
No	26 (18.4)	115 (81.6)			
Pain after insertion					
Yes	26 (30.2)	60 (69.8)	$\chi2$=8.966, df=1, p=0.003	3.776 (1.524-9.358)	2.829 (1.817-9.791)
No	7 (10.3)	61 (89.7)			
Complication other than pain after insertion of PPIUCD					
Yes	33 (25.0)	99 (75.0)	$\chi2$=4.091, df=1, p=0.043	3 (1.093-9.063)	1.132 (0.552-5.241)
No	4 (10.0)	36 (90.0)			
Any previous gynaecological problem					
Yes	15 (34.1)	29 (65.9)	$\chi2$=5.541, df=1, p=0.019	2.492 (1.149-5.405)	1.453 (0.495-4.267)
No	22 (17.2)	106 (82.8)			
Consent taken before insertion					
No	36 (24.2)	113 (75.8)	Fisher's Exact test, p=0.030	7.009 (1.012-53.839)	2.113 (1.070-17.641)
Yes	1 (4.3)	22 (95.7)			
Ever counselled on PPIUCD					
No	32 (27.4)	85 (72.6)	$\chi2$=7.388, df=1, p=0.007	3.765 (1.378-10.287)	2.128 (1.231-7.972)
Yes	5 (9.1)	50 (90.9)			
Decided to accept PPIUCD before delivery					
No	36 (26.3)	101 (73.7)	Fisher's Exact test, p=0.002	12.119 (1.6-91.781)	8.729 (1.52-44.554)
Yes	1 (2.9)	34 (97.1)			
Satisfied after using PPIUCD					
No	33 (32.4)	69 (67.6)	$\chi2$=17.447, df=1, p=0.000	7.891 (2.650-23.498)	2.516 (1.499-12.682)
Yes	4 (5.7)	66 (94.3)			
Follow up visits attended after insertion of PPIUCD					
No	34 (27.2)	91 (72.8)	$\chi2$=8.767, df=1, p=0.003	5.480 (1.595-18.825)	2.209 (1.302-16.150)
Yes	3 (6.4)	44 (93.6)			

Hosmer Lemeshow test, p=0.871; Nagelkerke R2=0.530.

DISCUSSION

Present study investigated the factors associated with removal of PPIUCD in rural women of Nadia district, West Bengal. Overall voluntary removal rate found in this study was 21.5%, whereas 16.3% had experienced spontaneous expulsion of the same. A study by Mishra S. in 2012 found that removal was 14.7% and expulsion rates at 4-weeks interval were 6.4%.[11] Both the rates were quite low than those found in the present study. The fact that most of the expulsions occur in first few months after insertion had been supported by previous researches.[11-13] Tatum et al, reported that the expulsion rates of PPIUCD at 1 and 12 months in Belgium and Chile were quite similar (4% and 7% respectively), but comparatively high in the Philippines (19% at 1 month and 28% at 12-months).[14] The current study also revealed that majority of removals and expulsions were taken place within 2 months of insertion (32.4% and 75% respectively).

Main reasons for removal as found in this study were health problems (59.4%) including menstruation related problem, lower abdominal pain or other general health problems. In consistency with the findings, Mishra S. found that in 55.8% of cases removal was due to either bleeding, changes in menstrual cycle or pain in abdomen or perineum. Chethan R et al, also reported that menstrual disturbances were one of the major causes of discontinuation.[6,11] Multivariate analysis in this study revealed that women from joint families had higher odds of removal than those belonged to nuclear families depicting the fact that family opinion mattered a lot. Similar to the finding Goswami G et al, also found that major reason for removal was family pressure.[15]

Mishra S, reported that lack of knowledge about PPIUCD (66.94%), refusal from partner or family (50.28%), fear of pain and heavy bleeding (25.77%) were the major causes of refusal to acceptance of PPIUCD in his study; while the current study also demonstrated that fear is a major issue for removal.[11]

The current study revealed that only 27.3% of the acceptors had follow-up visits which was quite low than found by Mishra S, in 2012.[11] The later showed that 59.98% of the acceptors had follow-up visits. Multivariate analysis also demonstrated that acceptors who had not undergone follow-up visits had higher odds of removal.

Lack of education of woman or counselling regarding PPIUCD were major predictors of PPIUCD non-acceptance or removal as found in this study and also in previous researches.[11,16,17]

Counselling is highly effective if it is conducted during antenatal period and at frequent interval with involvement of partners or family members. But unfortunately, only the post-partum period is utilized for this which is not the ideal time to do so. Sometimes, with the joy of a new birth the woman or the husband gives consent carrying a little knowledge and without proper motivation. But as time passes, they used to make their mind for removal of the same due to various reasons which could have been counteracted through proper counselling at correct time.

The current study had various limitations. Due to time, manpower and financial constraints the study did not take the account of design effect in sample size calculation. Therefore, with a limited sample size and constraints in methodology the results might not reflect the actual picture of the whole district. There were several other issues which could not be addressed by the frame of a quantitative study. Researches with large sample size or in-depth qualitative studied should be done to evaluate the issue further.

CONCLUSION

The current study revealed that removal and expulsion rates of PPIUCD were quite high (21.5% and 16.3% respectively). Regarding factors related to removal, type of family, education, place of delivery and insertion of PPIUCD, designation of inserter, pain after insertion, prior decision making, consent with understanding, counselling, satisfaction with its use and follow-up visits were significantly associated with removal.

As the nation is slowly approaching towards population stabilisation contraceptives like PPIUCDs should be highly promoted through the front-line workers to cut down the unwanted pregnancies during post-partum period. The study clearly depicted that with mere counselling at frequent interval involving the partners and family members removal rate can be declined to a desired level. Regular training of the front-line workers, introduction of incentives, supportive supervision from higher authority are of utmost need. It is the antenatal period which should be utilised the maximum for inculcation of correct knowledge regarding every aspect of PPIUCD and decision making which in turn helps in identification of actual complications, motivation for follow-up visits and leads to a higher grade of satisfaction. The ultimate yield of declining the rate of removal thereby can be achieved in near future.

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