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A Prospective Study on Comparison of Depot Medroxyprogesterone Acetate and Postpartum Intrauterine Contraceptive Device as Contraceptive Method

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Abstract

Introduction: Contraception is one of the proximate determinants of fertility and the most important predictor of fertility transition. Depot Medroxyprogesterone Acetate (DMPA) and Intrauterine Contraceptive Device (IUCD) share some common features- both are Long Acting and Reversible Contraceptives (LARC), but the mechanisms are different. DMPA is a non-invasive, hormonal man oeuvre while IUCD is an invasive, non-hormonal one. The aim of our study was to compare the acceptance and reasons for non-compliance between DMPA and Postpartum Intrauterine Contraceptive (PPIUCD).

Materials & Methods: This hospital-based prospective and comparative study was conducted in the Department of Obstetrics and Gynaecology at SMS Medical College and Hospital, Jaipur. Women with a PPIUCD in-situ who were willing and medically fit to continue its use, as well as those willing and fit to use the DMPA injection, were included. Total of 200 post-partum women (100 in each group) were randomly assigned to two groups: Group A (DMPA as contraception) and Group B (PPIUCD as contraception).

Results: The mean age for DMPA group was 27.8 years while for PPIUCD group mean age is 25.6 years. Primi parous women wished to continue PPIUCD more than women with two or more children (X^2=6.71 & P-value=0.03). 25% of DMPA users and 10% of PPIUCD users had previously used oral pills, while 37% of DMPA users and 35% of PPIUCD users had used condoms. The DMPA group reported more irregular spotting and high rate of amenorrhea as menstrual changes while PPIUCD group reported more irregular increased menstrual flow. Weight gain is significantly higher in the DMPA group (22%) compared to the PPIUCD group (5%) (χ^2 = 30.2, P = 0.001). Injection site reactions were unique to the DMPA group, while overall complication rates were higher in the PPIUCD group. Continuation rates were higher in the DMPA group (85%) compared to the PPIUCD group (70%) (χ^2 = 1.2, P = 0.01). The

pregnancy rate was low, with only one case reported in the PPIUCD group.

Conclusion: Both methods effectively prevent pregnancy, but DMPA is more acceptable and more compliant method as compared to PPIUCD in women in post-partum period.

Keywords: DMPA, PPIUCD, Contraceptive Method.

Introduction

Family planning is adopted voluntarily, upon the basis of knowledge, attitude and responsible decisions by individual and couples, to promote the welfare of the family and thus, contribute effectively to the social development of the country (WHO).Planning, provision and use of birth control is called family planning.[1] It is an essential fundamental human right for the welfare of the individual, family and society as a whole. Birth control methods have been used since ancient times, but effective and safe methods only became available in the 20th century.[2] The use of safe and effective contraception is the need of the hour as India is the second largest populous country in the world accounting for 17.5% of the world's population.[3] India was the first country in the world to implement a Family Planning, as early as 1952, with an aim of controlling its population which has already reached 1.26 billion. Considering the high decadal growth rate of 17.64, the country's population is slated to surpass that of China by 2028 United Nations Development Programme (UNDP). Family planning can avert more than 30% of maternal deaths and 10% of child death if couples spaced their pregnancies more than two years apart. In India, 65% of women in the first year postpartum have an unmet need for family planning.[4]

Intrauterine Contraceptive Devices (IUCD) provide very effective, safe and long-term yet reversible protection from pregnancy. It can safely be used for many years (for 10 years for Cu IUCD 380A, and for five years for Cu IUCD 375). Postpartum lactating women can also use Cu IUCD safely, as it does not interfere with breastfeeding. Postpartum IUCD can be inserted immediately after vaginal delivery, during caesarean section and up to 48 hours after birth, before women gets discharged from the health facilities.[5]

Depot Medroxyprogesterone Acetate (DMPA) is a hormonal contraceptive wit satisfaction level as it is provided by an injection every three months, which can be given outside the clinical facilities. It is also low cost and highly effective long acting method. It is also a reversible method and women's chances of getting pregnant after stopping its use are no different from those who have not used DMPA.[6]

Studies on Comparison of DMPA and PPIUCD as contraceptive method in Indian scenario are sparse. Therefore, we conducted this study to evaluate the same in the Indian context at a Tertiary care center which serve to a large area of population.

Material and Methods

This was an Hospital based Prospective & Comparative Study conducted at Department of Obstetrics and Gynecology SMS Medical College and Hospital, Jaipur. Every eligible case fulfilling the inclusion and exclusion criteria were included as a sample till the desire sample size of 200 cases was achieved.

Inclusion Criteria

- Women with PPIUCD in situ willing to continue and fit for continue as contraceptive method.
- Women who willing for injection DMPA and fit for continue as contraceptive method.

Exclusion Criteria

1. Women taking part in any other study.
2. Women not giving consent.
3. Women who are anemic (<7 gm/dl).
4. Women with genital tract infections.

5. Women with current breast cancer, severe hypertension, active thrombophlebitis, thromboembolic disorders, or cerebral vascular disease
6. Women who are more than 40 years age.

Methodology

A hospital based prospective study performed at department of Obstetrics and Gynaecology SMS Medical College. Socio-demographic data i.e age, address, ethnicity, parity, age at marriage, age at last child birth, mode of birth and menstrual history collected about each participant. All women included from immediate postpartum till 8 months of delivery. Patient selected and divided into two groups randomly.

Group A- DMPA as contraception: Depot Medroxy Progesterone Acetate given through intramuscular route (DMPA IM) in the luteal or deltoid region of dose 150 mg every 3 month. First dose of DMPA was given at or after 6 week of postpartum and second dose to be given 3 month after 1st dose of DMPA. Follow up was done at 3 month and 6 month for complication and compliance.

Group B- PPIUCD as contraception: IUCD inserted postpartum, right after birth (post placental)-10 minutes after expulsion of placenta or soon after birth (immediate post partum)-within 48 hours after delivery or during cesarean section (Trans cesarean) or upto 8 months.

Statistical Analysis

Data from the questionnaires were entered in Microsoft Office Excel 2007 and two Master Charts were prepared (one for each method of contraception). Data from the tables were transferred to IBM Statistical Package for the Social Sciences, version 20.0 (SPSS Inc., Chicago, IL, USA). Pearson's Chi-square test was used for variables and p-values were calculated to find out the statistical significance of the variables. The p-value <0.05 was considered statistically significant.

Results and Observation

In the present study, the mean age for DMPA group was 27.8 years while for PPIUCD group mean age is 25.6 years. We found that primiparous women wished to continue PPIUCD more than women with two or more children. We did not find significant difference in education levels between the groups (P - value 0.32). We observed that Lower socioeconomic group is more associated with PPIUCD use while middle socioeconomic group have more DMPA users. We did not find significant difference in mean weight (DMPA - 65.4 kg, PPIUCD - 62.8 kg), height, and BMI between the groups. We found that, 25% of DMPA users and 10% of PPIUCD users both previously preferred oral pills as contraceptive method and 37% of DMPA users and 35% of PPIUCD users had relied on condoms as their previous contraceptive method.

We found that that mean duration of use was higher in the DMPA group i.e. 13.5 months as compared to the PPIUCD group i.e. 10.8 months. Regarding pregnancy rates, no pregnancies were reported in the DMPA group, while there was a 1% pregnancy rate in the PPIUCD group. Satisfaction levels were measured on a scale from 1 to 10, with DMPA users reporting a higher average satisfaction level of 7.8, whereas PPIUCD users reported a lower average satisfaction level of 6.5.

Table 1: Menstrual Changes

Menstrual Change	DMPA Group (N=100)	PPIUCD Group (N=100)	X^2	P value
No Change	34	60	12.54	0.0001
Irregular Spotting	36	10	17.6	0.0001
Increased Menstrual Flow	2	28	24.51	0.0001
Amenorrhea	28	2	24.51	0.0001

In table 1, We found that menstrual changes seen in both the groups - DMPA group and PPIUCD group. DMPA group reported more amenorrhea and irregular spotting than PPIUCD group. PPIUCD group reported more increased irregular menstrual flow.

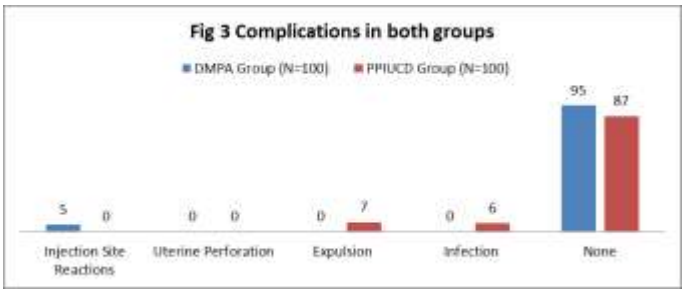
Table 2: Side Effects Experienced

Side Effect	DMPA Group (N=100)	PPIUC D Group (N=100)	X^2	P value
Weight Gain	22	5	10.9	0.001
Headaches	6	6	0	1
Lower abdominal Pain	2	25	20.7	0.0001
Mood Swings	10	6	0.6	0.4
Breast Tenderness	10	6	0.6	0.4
None	50	52	0	1

In table 2, There was various side effects seen with DMPA users and PPIUCD users like weight gain, headaches, lower abdominal pain, mood swings and breast tenderness. We found that Weight gain is significantly higher in the DMPA group (22%) compared to the PPIUCD group (5%) i.e($\chi^2 = 10.9$, P = 0.001).

Lower abdominal pain significantly higher in the PPIUCD group (25%) compared to the DMPA group (2%) i.e (X^2=20.7, P=0.0001)

Graph 1:



In Graph 1, We found that Injection site reactions were unique to the DMPA group. Similarly in PPIUCD users expulsion of PPIUCD seen. Overall complication rates were higher in PPIUCD group.

Table 3: Continuation and Discontinuation Rates

Status		DMPA Group (N=100)	PPIUC D Group (N=100)	P-Value
Continuation		85	70	0.01
Discontinuation	Pregnancy	0	1	
	Menstrual Changes	12	18	
	Family pressure	0	4	
	Missing Thread	N/A	5	
	Wanted pregnancy	3	2	

In table 3, we observed that Continuation rates were higher in the DMPA group (85%) compared to the PPIUCD group (70%, $\chi^2 = 1.2$, P = 0.01). That is not significant difference. The study shows distinct differences in side effects, complications, and user satisfaction between DMPA and PPIUCD, with PPIUCD generally showing higher complications and lesser satisfaction.

We found that the pregnancy rate was low with only one case reported in the PPIUCD group.

Discussion

In the present study, the significant age difference between the DMPA and PPIUCD groups ($\chi^2 = 7.8$, P = 0.001) reflects a trend observed in several studies. For instance, Sougata Kumar Burman et al.[7] (2021) was found that acceptance of PPIUCD in women of age group 21-25 years was significantly higher than women of other age groups.

We observed that primiparous women were more inclined towards PPIUCD and multiparous women with one and two children accepted DMPA method was consistent with existing literature. This trend supported by Ashwini Najan[8] (2023) On analyzing the association

between the acceptance of PPIUCD and obstetrics history in the present study, it was found that in Group A the majority of women who accepted PPIUCD were gravida 1 and 2 whereas no such association of parity with acceptance was seen in Group B.

We found that higher satisfaction levels and longer duration of use in the DMPA group suggest better overall user experience compared to PPIUCD**.** This is consistent with the finding of Sougata Kumar Burman et al[7](2021) supports this, the total acceptance of DMPA was found to be significantly more than that of PPIUCD (p-value=0.004).

In the present study, DMPA group reported higher rates of amenorrhea and irregular spotting, which is a known effect of DMPA. This finding aligns with the study by Meczekalski B.et al.(2022) found that prolonged use of DMPA causes atrophy of the endometrium, which leads to amenorrhea wnd irregular spotting in women using this form of contraception. After 12 months of usage amenorrhea has been reported in 55% of women and after 1 month in 24-68% of women. Agarwal, Swati (2022) observed most of the women (56.7%) had no complaints with PPIUCD use, while abdominal pain and irregular heavy menstrual bleeding were the most common side effects observed in 132(15%) and 117 women(13.3%), respectively.

We found Continuation rates were higher in the DMPA group (85% vs. 70%) as compare to the PPIUCD group, reflecting better adherence and satisfaction. This trend is supported by the study by Burman SK et al[7] (2021) also found overall acceptance of DMPA (87.3%) was found to be much more than that of PPIUCD (63.6%). Gupta et al[8](2023) found that removal rata of PPIUCD was 13.9% at six months postpartum. The main reason for discontinuation included pain, AUB, infection, and family pressure. Curtis et al[9] (2016), which found higher continuation rates with DMPA compared to IUDs due to user preferences and convenience.

Conclusion

The study shows that older and middle socioeconomic women preferred DMPA, while younger and lower socioeconomic women chose PPIUCD. DMPA group reported higher rates of amenorrhea and irregular spotting. PPIUCD Lower abdominal pain and irregular heavy menstrual bleeding were most common side effect seen with PPIUCD users. Both methods effectively prevent pregnancy, but DMPA users reported higher satisfaction and longer use despite more weight gain and higher rates of amenorrhea. Personalized counselling is essential to address individual needs, guiding the choice between DMPA and PPIUCD based on age, socioeconomic status, and side effects.

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