



INTRAUTERINE CONTRACEPTIVE DEVICE; EFFECTIVENESS COMPARISON OF POSTPARTUM INTRAUTERINE CONTRACEPTIVE DEVICE (PPIUCD) VERSUS INTERVAL IUCD

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ABSTRACT... Objectives: To compare the frequency of effectiveness of postpartum IUCD (PPIUCD) with interval IUCD at Tertiary care Hospital in Hyderabad. **Study Design:** Randomized controlled trial. **Setting:** Gynaecological and Obstetrical Department, Liaquat University Hospital, Hyderabad. **Period:** Six months from February 2016 to July 2016. **Material and Methods:** Total 100 women were studied. All the women with age 18 to 40 years, having at least one alive child were included in the study. Women were divided in two groups according to contraception methods of IUCD (50 women in each group). In Group-A IUCD were inserted after placental delivery within 10 minutes to 48 hours (PPIUCD) and in group-B IUCD were inserted any time of women's menstrual cycle (Interval IUCD). All the women were followed for 6 months. All the data regarding effectiveness among both groups was recorded. **Results:** Mean \pm SD age of group-A (PPIUCD) patients was 26.02 ± 5.87 years while group-B (Interval IUCD) was 26.34 ± 5.95 years. Majority of patient's i-e; 76.0% of group-A and 68.0% of group-B were from urban areas. IUCD was successfully place among 94.0% women of group-A and among 98.0% women in group-B. At the end of 6 months follow-up, 86.0% patients of group-A continued PPIUCD while in group-B, 96.0% women continued Interval IUCD. After 6 months follow-up, effectiveness of IUCD was 90.0% in group-B and 80.0% in group-A. Stratified analysis revealed that there was a non-significant effect of age on effectiveness of IUCD among both groups (P values= 0.094 & 0.223 respectively) so was the parity (P values= 0.384 & 0.747 respectively). **Conclusion:** It was concluded that interval IUCD found to be effective method as compare to post partum IUCD (PPIUCD). While women have recently given birth to neonate were more agreed to practice of PPIUCD, due to its quick insertion.

Keywords: Contraception, Postpartum IUCD, Interval IUCD, Effectiveness.

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INTRODUCTION

Rapid growth in population is increasing socio-economic problems on one hand while on the other hand it directly increases the health related problems especially the rate of obstetrical morbidity and mortality.¹ Deaths of women during or after pregnancies / childbirth lead to more serious and unlimited adversity for the affected family. The only solution to this is control of child birth through family planning. Although contraceptive knowledge in Pakistan is quite high (>90%) still the contraceptive prevalence rate (CPR) is low i-e 30%.^{2,3} One potent reason of this low CPR is socio-cultural setup of Pakistan in which despite of willingness of reproductive age women does

not favor them to reach the healthcare center for getting a contraceptive method between two pregnancies.⁴ It is very crucial to note that for many such women delivery is a unique opportunity to uptake a contraceptive methods like intrauterine contraceptive devices (IUCDs). It is 99% effective in preventing pregnancy.⁵ Worldwide; the IUCD is most widely used reversible contraceptive method as it prevents an estimated 60 million unwanted pregnancies per year. The IUCD remains effective for 5–12 years continuously. Copper-bearing IUCDs (CuT-380A and Multiload Cu-375) and hormone-containing IUCDs (Levonorgestrel intrauterine system LNG-IUS) are some of its types.⁶ IUCDs can be inserted

soon after delivery, or delayed for 6 weeks when a woman returns for a routine postpartum care visit.⁷ If inserted upto 48 hours (but preferably within 10 minutes) of placental delivery then it is called post partum IUCD (PPIUCD) while if inserted after 4th week postpartum or completely unrelated to the pregnancy then it is called interval IUCD.^{8,9}

Difference between the two types is that with PPIUCD, the woman is already present at health facility, highly motivated and not in need to come in contact with medical services again, while there is high risk of drop out of a majority women if they are called for interval IUCD. Also complications are minimal with PPIUCD.^{10,11} A study compared the two IUCD methods and reported that successful placement of IUCD occurred in 98% clients of PPIUCD while 90% in interval IUCD patients.¹² Expulsion rate with PPIUCD was 24% within 6 months while with 4.4% with interval IUCD (P value = 0.008). More women i-e; 84.3% still continued PPIUCD after 6 months or more compared to 76.5% with interval IUCD (P value = 0.032).¹²

Another study comparing two methods found that at the 3 months follow-up, the expulsion rate was 16% with PPIUCD compared to 2.7% with interval insertions (P value <0.003).¹³ Further a very recent study reported that bleeding as a cause of removal was significantly more in interval IUCD group (88.5%) compared to 23.5% among PPIUCD group.¹⁴ Though the method is very effective yet there is conflicting evidence from different studies.^{12,14} There is an immediate need of a safe, effective and long acting method of contraception in local population which should have been tested in local setting. Kafiye Eroglua, et al compared in his study immediate postplacental and early postpartum intrauterine device (PPIUCD) insertions with interval IUCD insertions with respect to efficacy and complications in 268 women in whom the TCu 380A IUCD insertions were performed. Complications and pregnancies encountered at the end of one year following IPP, EP and INT insertions were compared and found that IPP and EP insertion of the TCu 380A IUCD is an effective and convenient procedure, and though expulsion

rates in these groups are higher than in the INT group.¹⁵ There was very little research no such research study done in Pakistan which compared PPIUCD with interval IUCD. Because there are physical, social, psychological & demographic variations between populations of different regions and cultures; therefore a separated study in our population is necessary. This provides a strong rationale for conduction of this study. The results of this study will recommend the safest and more effective method to address unmet need of family planning. Further if; PPIUCD is found to be more effective then it will be recommended.

MATERIAL AND METHOD

This randomized controlled Trial was conducted at gynaecological and Obstetrical department of Liaquat University Hospital, Hyderabad. Study duration was 6 months from February 2016 to July 2016. All the women with age 18 up to 45 years, having at least one alive child were included in the study. All the women with chorioamnionitis during labour, prolonged rupture of membranes (more than 18 hours), peurpural sepsis, postpartum endometritis, History of purulent (Pus like) vaginal / cervical discharge (due to Gynaecological infection like PID, gonorrhoea, or Chlamydia), history of abnormal uterine bleeding and immediately after septic abortion were excluded from the study.

The process of data collection was started with taking written consent from the patients' husbands. Only consenting patients were included in the study. Selection criteria were strictly followed. There were two groups in the study. Group allocation was made by asking women to choose any one of two opaque envelopes (containing name of a group) from a transparent jar. Group-A comprised of women accepting PPIUCD. The group A got PPIUCD insertion within 48 hours after delivery; Group-B were offered interval IUCD which was inserted after puerperium. In group- A patients, IUCD was implanted with ten minutes of delivery by the trained obstetrician using a Kelly's placental forceps. Group-B constituted of the women who were administered interval IUCD after puerperium.

Data were gathered on a prescribed proforma. Data on demographic variable like name, husbands name, women age, parity, address were collected. Data on study variables like type of insertion (PPIUCD or Interval IUCD), successful placement, continuation & the outcome variable i-e; effectiveness of IUCD at the 6 months follow-up were collected by the researcher.

Data Analysis Plan

SPSS version 20 was used for data entry and analysis. Continuous variables like age, parity were analyzed as mean + standard deviation. Frequencies & percentages were calculated for successful placement, continuation rate & the outcome variable i-e; effectiveness of IUCD at the 6 months follow-up. Age, parity were stratified to look for effect modification of effectiveness of IUCD in either group. It was followed by application of Chi-square to test the hypothesis and significance of difference between the effectiveness of IUCD among the two groups. P value <0.05 was taken as significant.

RESULTS

The study comprised of two groups which were administered with two different types of IUCD insertions (Postpartum versus Interval). The results of this show that the both the groups were similar regarding basic demographic features of patients in them. Mean \pm SD age of group-A (Postpartum IUCD) patients was 26.02 ± 5.87 years, while mean \pm SD age of those in group-B (Interval IUCD) was 26.34 ± 5.95 years. More than half of patients i-e; 62% (n= 31) in group-A & 54% (n= 27) were of age between 21-30 years. Those of age less than 20 years were 18% (n= 9) in group-A while 22% (n=11) in group-B. Likewise; those of age 31-40 years were 20% (n= 10) in group-A while 23% (n=12) in group-B. (Table-I)

The mean \pm SD parity of the group-A was 1.90 ± 1.07 children with a range from 1 to 4; while in Group-B the mean \pm SD of parity was 1.76 ± 0.98 children with a range from 1 to 4. (Table-I)

Majority of patients i-e; 76% (n=38) in group-A and 68% (n=34) in group-B belonged to urban areas. (Table-I)

IUCD was successfully placed in 94% (n= 47) patients of group-A and in 98% (n= 49) patients in group-B. (Table-II)

At the end of 6 months follow-up, 86% (n= 43) patients of group-A continued the use of the intrauterine device (PPIUCD) while in group-B, 96% (n= 48) patients continued the use of the intrauterine device (Interval IUCD). (Table-II)

Non-expulsion (retention) rates of IUCD done it was noted that 84% (n= 42) patients of group-A while in group-B, 96% (n= 48) patients has retained the intrauterine device. (Table-II)

The final outcome at 6 months follow-up of this study was the effectiveness of IUCD among the two groups. It was noted that interval IUCD [group-B: i-e; 90% (n=45) was more effective as compared to the PPIUCD [group-A: i-e; 80% (n= 40)]. (Figure-1)

Overall comparison followed by application of chi-square test showed that there was insignificant difference between the two the methods of IUCD, however; the difference was not supported by statistical significance i-e; p value = 0.131. Stratified analysis further revealed that the age of patient was a non-significant effect modifier on the effectiveness among the two groups. In group-B, the effectiveness of IUCD slightly decreased but remained 100% at both ends of age categories. On the other hand the effectiveness of IUCD constantly decreased with increasing age among group-A (PPIUCD) patients. The findings were not significant (P values= 0.094 & 0.223 respectively). (Table-III) Stratified analysis of parity came with the mimicking difference; that with the increase in parity there was decrease of the effectiveness among PPIUCD (group-A). Conversely; in group-B (interval IUCD), the effectiveness of IUCD increased with increasing parity. The findings were not significant (P values= 0.384 & 0.747 respectively). (Table-III).

| Variables | Group A Frequency (%) | Group B Frequency (%) | P-value |
|---------------------------|-----------------------|-----------------------|---------|
| Age Groups | | | |
| 18-25 | 09(18.0%) | 11(22.0%) | 0.831 |
| 26-32 | 31(62.0%) | 27(54.0%) | |
| 31-40 | 10(20.0%) | 12(24.0%) | |
| Total | 50(100.0%) | 50(100.0%) | |
| Parity | | | |
| 1-2 | 13(26.0%) | 15(30.0%) | 0.094 |
| 3-5 or >5 | 37(74.0%) | 35(70.0%) | |
| Total | 50(100.0%) | 50(100.0%) | |
| Residential Status | | | |
| Rural | 12(24.0%) | 16(32.0%) | 0.085 |
| Urban | 38(76.0%) | 34(68.0%) | |
| Total | 50(100.0%) | 50(100.0%) | |

Table-I. Demographic characteristics of patients n=100

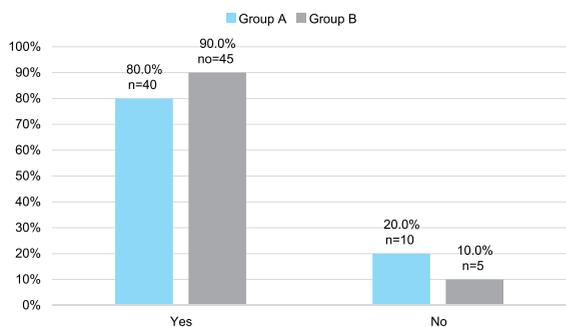
Group-A (Postpartum IUCD) (mean age =26.02+5.87 years), Group-B (interval IUCD) (mean age =26.34+5.95 years)

| Variables | Group A Frequency (%) | Group B Frequency (%) | P-value |
|--|-----------------------|-----------------------|---------|
| Successful Placement of IUCD | | | |
| Yes | 47(94.0%) | 49(98.0%) | 0.231 |
| No | 03(06.0%) | 01(02.0%) | |
| Total | 50(100.0%) | 50(100.0%) | |
| Continuation of IUCD | | | |
| Yes | 43(86.0%) | 48(96.0%) | 0.089 |
| No | 07(14.0%) | 02(04.0%) | |
| Total | 50(100.0%) | 50(100.0%) | |
| Non-expulsion (Retention) of IUCD | | | |
| Yes | 42(84.0%) | 48(96.0%) | 0.095 |
| No | 08(16.0%) | 02(04.0%) | |
| Total | 50(100.0%) | 50(100.0%) | |

Table-II. Comparison of successful placement of IUCD in the two groups. n=100

| Age Categories (Years) | Effectiveness | | | |
|------------------------|---------------|----|---------|----|
| | Group A | | Group B | |
| | Yes | No | Yes | No |
| 18 to 25 | 9 | 0 | 11 | 0 |
| 26 to 32 | 24 | 7 | 22 | 5 |
| 33 to 40 | 7 | 3 | 12 | 0 |
| Total | 40 | 10 | 45 | 05 |
| P-value | 0.094 | | 0.223 | |
| Parity | | | | |
| 1-2 | 9 | 4 | 12 | 3 |
| 3-5 or >5 | 31 | 6 | 33 | 2 |
| Total | 40 | 10 | 45 | 05 |
| P-value | 0.348 | | 0.747 | |

Table-III. Effect of age and parity on effectiveness among two groups of IUCD insertion. n=100



p-value
Figure-1. Effectiveness of postpartum IUCD and interval IUCD at 6 months follow-up in both groups. n=100

DISCUSSION

The current study was undertaken to evaluate and compare the effectiveness of two different time modes of insertion of IUCD for purpose of contraception. Intrauterine devices inserted anytime during menstrual cycle of women have been found to be very effective method of contraception. However; a newer and different timing of its insertion in which the IUCD is inserted soon after the delivery and called as postpartum IUCD has not been studied in our patients.^{12,14}

Post postpartum IUCD (PPIUCD) insertion is the technique of placing an IUCD (up to 48 hours but preferably) within 10 minutes of placental delivery while interval insertion of IUCD is at any time between pregnancies at or after 4th week postpartum or completely unrelated to the pregnancy.^{16,17} PPIUCD provision and uptake are feasible for both providers and clients. PPFP that includes PPIUCDs has been used in several countries to reinvigorate family planning, especially in light of the health benefits to infants and mothers when the couple avoids a closely spaced or unintended pregnancy. Global efforts are encouraging women to go to health facilities for childbirth. This effort doubles as an opportunity for PPFP, as the PPIUCD can be used for spacing or limiting future pregnancies.¹⁵

In Pakistan; were a large majority of the women live in rural area and have limited access to medical facilities. In this scenario, they reach to tertiary care institution for delivery and at that time they are offered with a unique opportunity of

practicing a long term contraceptive method i-e; the PPIUCD. This offer will invariably lead most of them to accept the offer. If these women are properly counseled for this contraception method and are dealt well then it will be favorable for them as well as for the health of their family.

The current study noted that the patients in both groups at the end of six months follow-up had higher rates of retention and continuation of IUCD. Based on these parameters it was found in this study that interval IUCD was more effective as compared to the PPIUCD. Although; the finding was not statistically significant (P value = 0.131) yet, it reiterates the findings of the other contemporary studies. One such study by Katheith G, et al., (2013)¹⁸ and another study by Kittur S, et al., (2012)¹⁹ found that PPIUCD was effective among 83% & 85% respectively. Another study by Celen S and coworkers²⁰ documented that effectiveness of PPIUCD was reported to be 81.6% till 6 months follow-up. These studies' results not resemble current study results.

While consistently; other studies like Gupta A, et al.,¹⁴ Mohammad SA, et al.,²¹ and other reported that though PPIUCD is an effective but the interval IUCD is relatively more effective than postpartum approach.^{22,23} The effectiveness of interval IUCD peaked upto 99% in some of these studies. The acceptability of PPIUCD is also good.^{24,25}

The current study noted that insertion with any difficulty and successful placement of IUCD was quite easy with the PPIUCD especially the cases delivered through caesarean section because of clear exposure. However; the successful placement was also much high regarding interval IUCD. The experience of service provider had great role in proper insertion in interval IUCD. Uneventful insertion of IUCD further leads to lesser side effects and lesser expulsion rates.^{7-11,14}

The current study noted that safe placement/successful insertion of IUCD was more in PPIUCD group. While retention of IUCD/ non-expulsion and continuation as a contraceptive was slightly more common among the women in group of interval IUCD. This overall affected the

effectiveness which turned out to be more among interval IUCD group. The current study like other studies has found that the expulsion rates are higher among women using PPIUCD. Sudha CP, et al.,²⁶ reported that in their study 1.7% PPIUCD and expulsion occurred while Kittur S et al.²⁷ who have reported it to be 5.23%. In current study the PPIUCD expulsion rate was in concordance with these rates (i.e;16%) while that of Interval IUCD was only 10%. In current study we noted that mean age of both groups was about 26 years which shows that the sample in both groups was of younger age patients which were highly fertile which was represented from their parity as well. These women were the ideal candidates for these methods of contraception. The current study also noted that about half of the study participants were in their 3rd decade of life & one third other were in their 4th decade of life. Other studies have reported that majority of their study participants were in 3rd decade of life & only small number was in the 4th decade of life.^{5-12,14,23} This difference of age is purely demographic difference. Stratified analysis in this study found that the effectiveness of interval IUCD was maximum in younger and elder age women as compared to PPIUCD wherein; the effectiveness of IUCD decreased with increasing age. (P values= 0.094 & 0.223 respectively).

Like all other invasive interventions, the postpartum IUCD insertion, is not free from its complications and side effects. It may increase the risk of perforation of uterus, pain, bleeding as well as may decrease the effectiveness through expulsion of IUCD. Side effects of have been reported variable with either mode of insertions of IUCD.^{5-12,14,23} Studies have suggested that pain, discomfort, bleeding complications and displacement into the abdominal cavity are some of the side effects- but the current study did not work on these as it was not within the scope of this study.

This short, smaller scope study along with all its limitations like small sample, shorter duration of follow-up has provided the good piece of evidence that postpartum IUCD insertion is a useful technique. Although it is not as effective

as the interval IUCD is, still it is the best approach to streamline the potential family planning consumers which otherwise would not be able to adopt contraception.

Definitely; the approach will help enhance the contraceptive prevalence rate and put positive results over the health of mother and the newborn.

CONCLUSION

It was concluded that interval IUCD found to be effective method as compare to post partum IUCD (PPIUCD). Successful Placement, continuation and Retention rates were insignificantly higher among interval IUCD. While women have recently given birth to neonate were more agreed to practice of PPIUCD, due to its quick insertion. Although it is slightly less effective than the interval IUCD method yet the propagated practice of PPIUCD can play a great role in accepting contraception in our country.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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|-------|--------------------|---|---|
| 1 | Faryal Sardar | Data collection, and manuscript writing |  |
| 2 | Ifat Balouch | Manuscript writing and review |  |
| 3 | Naseem Bajari | Data analysis and review the manuscript |  |