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A study on association of pelvic inflammatory disease following PPIUCD insertion

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Abstract
To assure and motivate patients that IUCD (intrauterine contraceptive device) is not a risk factor for development of PID. (Pelvic inflammatory disease). Post placental IUCD insertion after normal vaginal delivery and intra-caesarean IUCD insertion is not associated with complications like menorrhagia, excessive vaginal discharge, lower abdominal pain.

Keywords: PID- Pelvic inflammatory disease. IUCD- intrauterine contraceptive device. PPIUCD- post placental IUCD

Introduction
PID is the clinical syndrome caused by microorganisms that ascend from cervix or vagina to upper genital tract [6]. PID is caused by endogenous vaginal flora (anaerobic and aerobic bacteria), aerobic streptococci, mycobacterium tuberculosis and STI's such as Chlamydia trachomatis and Neisseria gonorrhoea [6]. PID leads to infertility, ectopic pregnancy, etc., IUCD insertion introduces temporary microbial contamination into the uterus which may increase the risk of pelvic inflammatory disease. So, it is important to know whether IUCD insertion increase the risk of PID [13]. Among the contraception devices, Copper releasing IUCD's may have lesser risk for pelvic inflammatory disease and also gives contraception which is safe, long acting, reversible without any major complications [1].

Aim & Objective
To investigate the background and reproductive history of women presenting with PID. To identify the risk factors for PID and to examine whether PPIUCD use is an independent risk factor for PID. To look for association of PID among PPIUCD users.

Materials and Methods
This prospective study done on 50 patients who had IUCD insertion after normal vaginal and cesarean delivery during the period May 2019 - October 2021 in Rajah Muthiah Medical College and Hospital. Consent obtained. A detailed history, systemic examination and basic investigations done. History noted regarding antenatal, intrapartum and postnatal period regarding source of infection. Patients followed up after 6 weeks of PPIUCD insertion with WBC, CBC with ESR and high vaginal swab to find out the evidence of infection among PPIUCD users which can lead to pelvic inflammatory disease. Patients who met inclusion and exclusion criteria are included in this study.

Sample Size
50 patients.

Inclusion Criteria
All patients who had PPIUCD following normal vaginal delivery and Caesarean section.

Exclusion Criteria
- Patients who had other comorbidities like Diabetes Mellitus, Systemic Hypertension, Cardiac disease, Renal disease.

- Patients with local cervical lesion like polyp.
- Sexually transmitted disease.

Statistical Analysis

The collected data were subjected to statistical analysis using SPSS17 version software.

Results

Among normal delivery 79% belonged to age group 21-25 years, among caesarean 79% belonged to 18-20 years age group. At 6 weeks follow up lower abdominal pain was 6.9%, 3.6% among normal delivery and caesarean patients respectively. Menstrual irregularities was 3.4%, 1.8% at 6 weeks follow up among normal and caesarean delivery respectively. Excessive Vaginal discharge was 4.3%, 5.3% in normal and caesarean delivery after 6 weeks. IUCD removal was higher in normal delivery after 6 weeks 8.6% compared to caesarean patients. ESR value before and after 6 weeks of IUCD insertion was 38.04±21.93, 57.87±23.35; respectively. TLC was 10429.83±2828.37 before and 12679±3825.07 after 6 weeks, normal and caesarean respectively. Missed strings were more among normal delivery at 6 weeks 13.17% than 3.2% in caesarean deliveries. No case of uterine perforation noted. On high vaginal swab report, the commonest organism growth found in high vaginal swab is *E. coli* is the highest among all the in the both the mode of the delivery (p value < 0.004).

The commonest organism growth found in high vaginal swab is *E. coli* is the highest ppicud insertion cesarean delivery <0.005. Which is statistically more significant when compared to normal delivery review.

Table 1: Age Distribution

AGE Frequency	Normal delivery	Cesarian	P value
18-20	5 (7%)	10 (79%)	0.639
21-25	10 (79%)	5(11%)	
26-30	5 (11%)	10 (11%)	
Total	**25**	**25**	

Table 2: Hematological parameters in control and study subjects (values are mean ± SD)

Parameters	Before insertion PPICUD (n = 50)	After 6 weeks of review
PCV	31.49± 4.08	31.42± 2.72 NS
Hemoglobin	10.8 ± 2.72	11.39 ± 1.54 NS
ESR	38.04± 21.93	57.87 ± 23.35 †
TLC	10429.83± 2828.37	12679 ± 3825.07 ‡
Neutrophils	74.69 ± 7.41	77.87± 9.51 NS
Lymphocytes	19.12± 7.57	17.82 ± 7.87 NS
Monocytes	0.45± 0.50	0.82± 0.84*
Eosinophils	0.93 ± 0.97	0.75 ± 0.89 NS
Basophils	0.419 ± 0.5	0.675 ± 0.61*

Table 3: Follow Up At 6th Week

6th Week follow up	Normal delivery (group A)	Cesarian (group B)	p Value
Lower abdominal cramp	10(7.9%)	8(6.6%)	0.676
Presence of Menstrual irregularities	8(6.3%)	4(3.3%)	0.260
Excessive vaginal discharge	11(8.7%)	12(9.8%)	0.828
Infection	3(2.3%)	2(1.6%)	1.000
H/o of IUCD removal	4(3.2%)	3(2.5%)	0.734
Threads seen on per speculum	5 (4.3%)	6(5.6%)	0.000
IUCD not found (confirmed by Ultrasonogram)	3(5.6%)	5(4.1%)	
IUCD expelled	3(2.5%)	2(1.7%)	1.000
Missed strings	2(13.17%)	8(3.2%)	0.000

Table 4: Microorganism Comparison In Normal And Cesarean Delivery

S. No	Organism	Normal delivery	Cesarian delivery
1	*E. coli*	10	8
2	*Enterococci*	1	2
3	*Staphylococci*	4	2
4	Group B *Streptococcus*	2	1
5	*Gardnerella vaginalis*	3	7
6	*Candidial* species	5	5
	Total	**25**	**25**

Table 5: 6 Weeks Th Review of Microbiological Pattern

S. No	organism	6 Weeks Follow Up of PPICUD Insertion normal delivery	6 Weeks Follow Up of PPICUD Insertion Cesarian delivery
1	*E. coli*	5	8
2	*Enterococci*	1	3
3	*Staphylococci*	4	2
4	Group B *Streptococcus*	2	6
5	*Gardnerella vaginalis*	2	3
6	*Candidial* species	11	3
	Total	25	25

Discussion

PID is disease of reproductively active women. It is the inflammation of the upper female genital tract involving uterus, Fallopian tubes and ovaries [6, 7]. Source of infection is mostly from lower genital tract microorganism [6, 7]. Most common cause of PID is due to Chlamydia trachomatis, Neisseria gonorrhea (STI) it may also occur due to endogenous aerobic and anaerobic organisms of lower genital tract. Patients presenting with complaints of lower abdominal pain, menorrhagia, excessive vaginal discharge, retroverted uterus on examination, cervical motion tenderness on per vaginal examination, increased WBC, ESR, organism growth in high vaginal swab culture increases the suspicion of PID. Nature prevents the development of PID by intact hymen, acidic vaginal secretion, cervical mucus plug, downward ciliary motion of endometrial lining. After pregnancy, abortion, menstruation this protective mechanism is impaired [12]. Procedures like curettage, manual removal of placenta and IUCD insertion increase the risk of developing pelvic inflammatory disease. IUCD's must be inserted under strict aseptic precautions to reduce the risk of developing PID. Among the IUCD's Cu-T containing IUCD have less incidence of PID. After a live birth, a woman should wait at least 24 months (but not more than five years) before attempting the next pregnancy [1, 2]. Copper containing IUCD Cu-T 380A will be the best option in view of easy& one-time insertion, ie. effective for 10 years and also cost- effectiveness. Among various types of contraception our study deals with incidence of PID among Postpartum IUCD Insertion i.e. Intra-caesarean Method and postplacental insertion after normal vaginal delivery [14]. In our study we compared immediate intra-cesarean IUCD insertion and postplacental PPIUCD insertion after normal delivery. Here we use 50 patients. 50 patients were followed up at 6weeks with questionnaire and set of laboratory investigations. Here we look for incidence of pelvic inflammatory disease among PPIUCD users. We also assess WBC count, ESR, menstrual irregularities, abnormal vaginal discharge, lower abdominal pain among PPIUCD users before and after 6 weeks of insertion. During the follow up, at 6 weeks, lower abdominal cramp present in 7.9% in normal delivery higher than in cesarean (6.6%) p=0.676, hence not significant. At 6 weeks, Menstrual irregularities present in 6.3%in normal delivery higher than in cesarean (3.3%) p=0.260, hence not significant. At 6 weeks, excessive vaginal discharge present in 8.7% in normal delivery lower than in Cesarean (9.8%) p=0.828, hence not significant.

Infection rate is found to be higher in normal delivery (2.3%) than in caesarean (1.6%) p=1.000 at 6th week. At 6 weeks, Missed String present in 13.7%in normal delivery lower than in cesarean (3.2%) p=0.000, hence not significant. At 6 weeks incidence of IUCD removal is found to be higher in normal delivery (3.2%) than in caesarean (2.5%) p=0.734, hence not significant.

Expulsion rate is found to be higher in normal delivery (2.5%) than cesarean (1.7%) p=1.000 at 6th week. There is no complications such as uterine perforation and contraceptive failure in both groups during study period. The commonest organism growth found in high vaginal swab is *E. coli* is the highest among all the in the both the mode of the delivery (p value < 0.004). The commonest organism growth found in high vaginal swab is *E. Coli* is the highest in cesarean delivery <0.005. Which is statistically more significant when compared to normal delivery review. This microbial growth can be overcome by proper antibiotic coverage. To analyse whether they are significant or not, we putforth null hypothesis and analysed with Fishers Exact Test. On statistical analysis, it is found that there is no significant difference in occurrence of infection as well expulsion in both the groups. Regarding missed strings there is significant difference between group with higher values for intra-caesarean method. Hence it is stated that both post-placental and intra-cesarean insertion of IUCD is equally effective for contraception. Microorganism growth after IUCD insertion was significant among intra-caesarean method, which may lead to pelvic inflammatory disease. Proper antibiotic coverage might reduce its incidence [3-5].

Conclusion

Based on this study, it gives an conclusion that postplacental IUCD insertion after normal vaginal delivery and intra-cesarean IUCD insertion has no significant increase in infection rate, not associated with any other complications except higher incidence of missed strings among postplacental IUCD insertion after normal delivery at 6 weeks follow up. There was increased incidence of *E. coli* growth in high vaginal swab among intra-cesarean IUCD patients at 6 weeks follow up.

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