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A case control study of pelvic inflammatory disease (PID) and its association with IUD (Intrauterine device)

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Abstract

Objectives : To find out the role of intrauterine contraceptive device (IUCD) in pelvic inflammatory disease (PID). *Method :* Chi-square test was used statistical analysis. *Results :* The odds ratio for PID with IUD as risk factor was 2.19 with 95% confidence interval (CI) being 1.13 to 4.23. Among 140 cases IUD was present in 29 cases (19.33%) while in 150 controls it was in 16 cases (10.66%). The difference was statistically significant (p=0.027). (See Graph I). This suggests etiological fraction of 54.3% (CI 11.6% to 76.4%) among IUD uses. *Conclusion :* IUCD is a risk factor for PID.

Key words : pelvic inflammatory disease, intrauterine contraceptive device

Introduction

Pelvic inflammatory disease is one of the most serious infections facing women today. It is a common problem encountered in gynecological infertility, family planning, postnatal, legal abortions and sterilization clinics in India and abroad[1]. We can prove the association between risk factor and disease. So the present case control study was undertaken to know the association between PID and IUD.

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Methodology

This study was conducted at Shree Sayaji General Hospital (S.S.G.H.) which is a regional referral hospital attached to Government Medical College, Vadodara. Selection of cases and sources of cases:

The obstetrics and gynecology department of S.S.G.H. has daily outpatient service. Average daily out patients at this OPD is 100 gynecological cases per day of which 8% to 10% have pelvic inflammatory disease. In the present study 150 patients of PID who attended gynecology OPD of S.S.G.H. over a period of one year from 1st June 1997 to 31st March 1998 were selected with uniformly accepted criteria for PID as given under:

1. Complaint of lower abdominal pain
2. Vaginal discharge
3. Adnexal tenderness leading to pain

All cases meeting with the above diagnostic criteria

were labeled as clinical cases of PID. We obtained information by conducting in depth interview for upto 3 sessions with each patient.

Selection of sources of controls:

For each case, a control was selected from women attending S.S.G.H. outdoor for any complaints, health problems other than obstetric and gynecological. Curative, Preventive and General Practice (CPGP) unit of S.S.G.H hospital has adequately comfortable offices which provided necessary privacy for interviews of the control group. One hundred fifty controls were selected from CPGP unit over a period of one year from 1st April 1997 to 15th March, 1998.

A standard proforma was used to collect family planning details.

In order to evaluate the role of IUD as risk factor which might influence the pathogenesis of PID, each patient was matched with a patient in the concurrent group with respect to age (by five years age group).

The mean age in cases was 32.56±7.31 land in controls it was 32.58±8.05. The difference was statistically not significant.

Data processing and statistical analysis:

The entire information from the questionnaire of cases and controls was coded and data fed into computer by using statistical software EPI-Info. Data was analyzed by Epi-Info. Significance of difference in the prevalence of PID among patients (cases) and controls due to IUD was analyzed using Chi-square.

Results

The odds ratio for PID with IUD as a risk factor was 2.19 with 95% confidence interval being 1.13 to 4.23. This suggests the etiological fraction of 54.3% for pelvic inflammatory disease with confidence interval 11.6% to 76.4% among IUD users. The use of IUD was substantially higher in the group attending SSGH with as much as 19.3% of cases.

Thus estimated relative risk of PID with IUD user is higher if IUD users are compared with women using contraception. So Table 3 adjusted the comparison group to include only women using no method of contraception and found the risk associated with IUD to be below 2.01.

Among cases mean duration of IUD method use was lesser than the controls (Table 4). In the present study, in almost all the patients, IUD was inserted by doctors (35/36) (Table 5).

Table 1. Age.

Age group	Subjects	Control
16-20	02	06
21-25	28	24
26-30	38	41
31-35	42	38
36-40	21	20
>40	19	21

Table 2. Association between IUD and PID.

	PID Subjects	Controls	Total
IUD present	29 (19.33%)	16 (10.66%)	45
IUD absent	111	134	245
	140	150	290

Table 3. Comparison of IUD used V/s no method used.

	Cases(PID)	Controls	Total
+IUD	29 (22.3%)	16 (12.3%)	45
-IUD	101	107	208
Total patients	130	123	253

Table 4. Duration of IUD method use.

	Cases	Controls
Mean	21.839	34.875
Median	18.00	36.00
Mode	24.00	36.00

Table 5. Distribution o IUD insertions by different categories of health providers.

IUD insertion by	Cases	Controls
Doctors	20	15
Untrained	0	0
Trained	0	0
Nurse	0	1

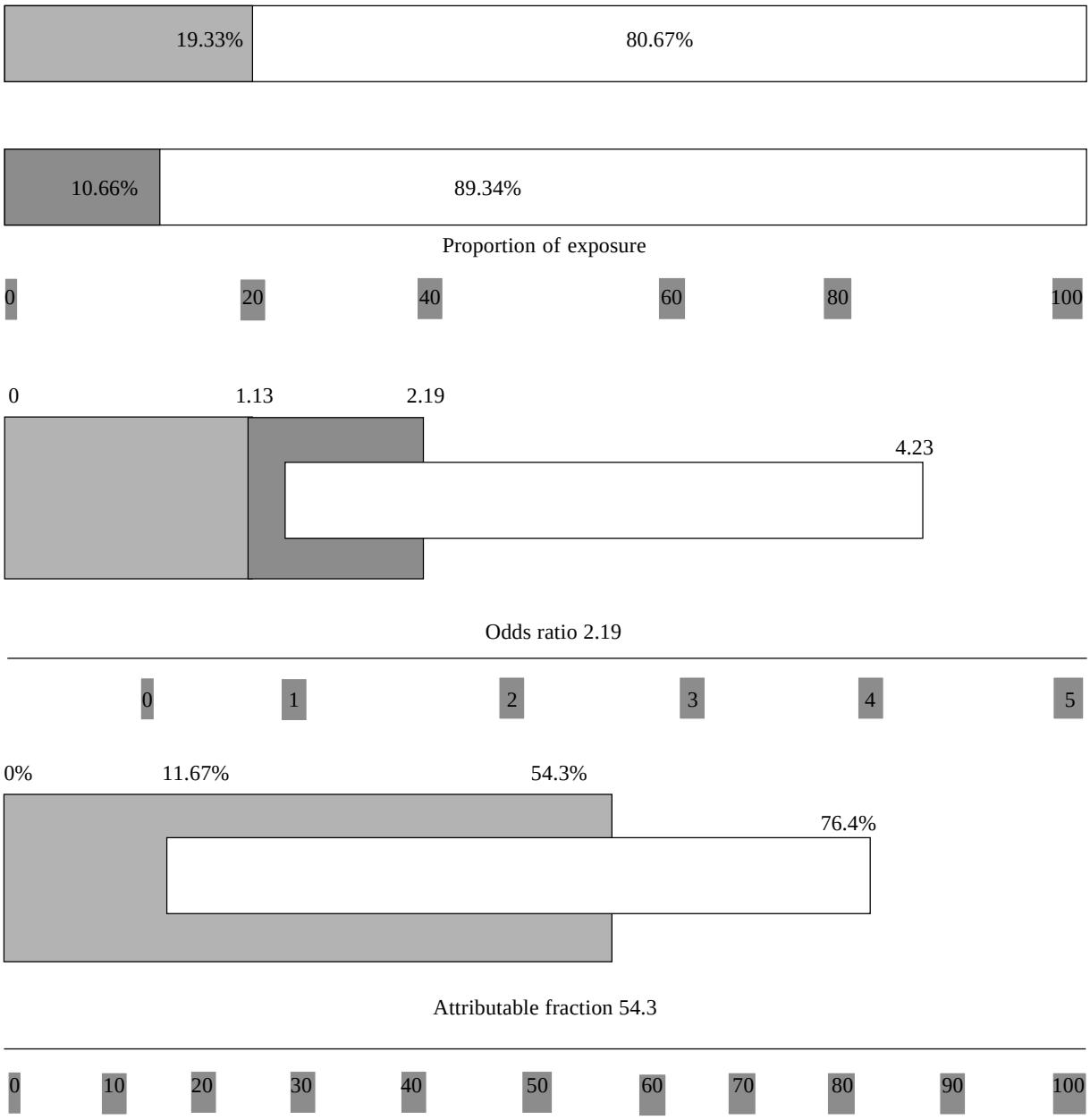

Figure 1. Association between IUD and PID

Discussion

Distribution of various methods used in our data matches well with the national data reported in Family Health Survey[2].

The present study is a hospital based study. The cases as well as control were drawn from the hospital. Hence other factors like occupation, income, socio-economic status, personal hygiene etc. are similar because both cases and controls represent the same group of patients presenting to the hospital. In ten cases information on contraceptive practice was not available as it was sensitive personal information which the patients chose not to divulge.

The odds ratio for PID with IUD as a risk factor was 2.19 with 95% confidence interval being 1.13 to 4.23 This suggests the etiological fraction of 54.3% for pelvic

inflammatory disease with confidence interval 11.6% to 76.4% among IUD users. The use of IUD was substantially higher in the group attending SSGH with as much as 19.3% of cases and 10.7% of the controls. The difference was statistically significant (p=0.027). The odds ratio depends upon the prevalence of IUD usage, socio economic conditions, whether or not patients have been previously pregnant and alternative contraceptive methods.

IUD use results in substantial morbidity caused by infection. PID develops when microorganisms from lower genital tract ascend into uterus and fallopian tubes. Several physiological factors have been suggested as accounting for the association between IUD and PID.

1. Sterile inflammatory reaction in the fallopian tubes and the endometrium.
2. Increased volume and duration of the menstrual bleeding.
3. Ascent of bacteria into the uterus during insertion[3,4].

CuT is the most frequent type of IUD used in our set up and by most of the private practitioners, government and semi-government institutions. Hence other types of IUD though available are used quite infrequently. So, the present study did not attempt at correlating type of IUDs and incidence of PID. The study also does not address IUD use among nulliparas, as in our country IUD is used only after one or more children.

The possible association between IUD use and development of genital tract infections among users still remains a controversial topic in contemporary contraception [5,6]. The initial investigation in the 1970's found an increase in the risk of PID ranging from two fold to nine fold among IUD users. The consistency of these finding strongly suggested a causal association. However epidemiological evidence derived in the 1980s showed the association between IUD use and PID to be overestimated. Three particular methodological problems in the early studies contributed to their overly pessimistic assessment.

Firstly imprecise criteria for diagnosis of disease and lack of standard reference group for comparison with IUD users [7,8].

Secondly PID diagnostic bias might occur among IUD users namely, an IUD user with a cluster of lower abdominal signs and symptoms would be more likely to receive a diagnosis of PID than would a woman with similar complaints but without an IUD [4]. Thirdly both oral contraceptives and barrier methods protect against PID [5,7,9].

Thus estimated relative risk of PID with IUD user is higher if IUD users are compared with women using contraception. So table 3 adjusted the comparison group to include only women using no method of contraception and found the risk associated with IUD to be below 2.01. Here it does not make much difference in odds ratio because sample size of using condoms and oral contraceptive is much smaller.

Studies of IUD use and PID in Sweden and US show relative risk ranging from 1.7 to 9.3 for IUD users compared with nonusers. For example, in a case comparison study of 515 Swedish women with acute salpingitis, Westrom et al[10] concluded that nulliparous IUD users were seven times as likely to develop PID as multiparous nonusers.

In the US, Welner Hanssen et al[4] showed the risk was 4.4 times higher in IUD users than in nonusers (P<0.001). Among previously pregnant women the relative risk was 3.4; 33% of the cases were IUD users compared with 15% of controls. This reinforces Westrom et al's conclusion that the risk of IUD related PID is greater for nulliparous women[10].

In UK, Assey et al[11] showed in a cohort study that higher frequency of acute and chronic PID existed among PID users and, their rates were significantly higher when compared to users of oral contraceptives and barrier methods.

Current evidence suggests that a smaller but still measurable, increased risk of PID associated with IUD use occurs at the time of insertion. Thus contamination of the endometrial cavity at insertion may be responsible for IUD related PID than the device itself. Whether PID is more likely to occur with longer IUD use is also unclear, since studies report conflicting results. Numerous studies have noted an inverse relationship between risk of PID and duration of IUD use. The most explicit estimate found the relative risk associated with other IUDs was highest in the first month after insertion (3.8), lower in months 2-4 (1.7) and not significantly elevated above baseline (1.1) at five months and beyond[12,13].

Among cases mean duration of IUD method use was lesser than the controls. The chronology of events suggests that in cases PID occurred subsequent to IUD insertion. The difference in the median duration of IUD retention could reflect the removal of IUD in cases of PID as compared to women who did not have PID.

In the present study, in almost all patients, IUD was inserted by doctors (35/36). So we cannot say anything about the association between occurrence of PID and insertion of IUD by doctors and others.

Conclusion

The present study suggests that IUD is a strongly associated risk factor for PID. Intrauterine contraceptive device is the most widely used contraceptive in India and any reduction in its use would compromise the Natural Family Planning Program. To avoid PID it is necessary that all precaution be taken to prevent the introduction of infection during insertion including treating existing infection prior to insertion of IUD.

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References

1. Pachauri S. Defining a reproductive health package for India: A proposed framework. (Regional Working Paper No. 4). New Delhi, Population Council, 1995.
2. Gandotra MM, Das NP, Mukherji S et al. National Family Health Survey Gujarat, 1993. Vadodara, M.S. University of Baroda, Population Research Centre, 1995.
3. Piotrow PT, Rinehart W, Schmidt JC. IUDs- update on safety, effectiveness and research. Popul Rep B 1979;49-98.
4. Wolner-Hanssen P, Eschenbach DA, Paavonen J et al. Decreased risk of symptomatic chlamydial pelvic inflammatory disease associated with oral contraceptive use. JAMA 1990;263:54-9.
5. Burkman RT, Lee NC, Ory HW et al. Response to the intrauterine device and pelvic inflammatory disease: the women's health study reanalyzed. J Clin Epidemiol 1991;44:123-5.
6. Kronmal RA, Whitney CW, Mumford SD. Intrauterine device and pelvic inflammatory disease: the women's health study. J Clin Epidemiol 1991;44:109-22.
7. Flesh G., Weiner JM, Corlett RC Jr et al. The intrauterine contraceptive device and acute salpingitis: a multifactor analysis. Am J Obstet Gynecol 1979;135:402-8.
8. Senanayake P, Kramer DG. Contraception and the etiology of pelvic inflammatory disease: new perspectives. Am J Obstet Gynecol 1980;138:852-60.
9. Osser S, Liedholm P, Sjöberg NO. Risk of pelvic inflammatory disease among users of intrauterine devices, irrespective of previous pregnancy. Am J Obstet Gynecol 1980;138:864-7.
10. IUD update on safety, effectiveness and research. Population reports B-3, Baltimore, Johns Hopkins University, 1979, B-68.
11. IUD update on safety, effectiveness and research. Population reports B-3, Baltimore, Johns Hopkins University, 1982, B-122.
12. Washington AE, Cates W Jr, Wasserheit JN. Preventing pelvic inflammatory disease. JAMA 1991;266:2574-80.
13. Washington AE, Aral SO, Wølner-Hanssen P et al. Assessing risk for pelvic inflammatory disease and sequelae. JAMA 1991;266:2581-6