

## PELVIC INFLAMMATORY DISEASE: RELATION WITH LIFE STYLE FACTORS AND CONTRACEPTIVE METHODS

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### ABSTRACT

**Objective:** Pelvic inflammatory disease (PID) is a common condition in which microorganisms colonizing the lower genital tract ascend to infect and inflame upper genital tract structures. In this study, we examined cross-sectionally women with the diagnosis of PID and relation with contraceptive methods and life-style habits.

**Material and Method:** This study carried out from January to May 2009 at Baskent University Alanya Medical & Research Center. Women who attended to hospital for gynecological complaints and diagnosed as PID (N:137) and women who had a diagnosis other than PID (N:108) were recruited to this study as a control. The women were subjected to a detailed, structured written questionnaire, including current contraceptive use, first intercourse, intercourse with another partner, genital hygiene.

**Results:** The groups were similar for demographic variables. Percentage of women with currently using oral contraceptives and IUD users were higher in PID group. Both alcohol use and tobacco use were more frequent in the PID group, and statistically significant. In both groups, women had no history of new sexual partner or more than one partner in the 4 weeks before enrollment to the study.

**Conclusion:** Our current observations are consistent with the notion that IUD increase symptomatic PID probably affecting the severity of upper genital tract disease, and also current alcohol use and smoking tended to increase the incidence of PID. So women free of cervical infections seem to have the lowest risk of upper genital tract infections associated with IUD and IUD still appear to be most acceptable modern contraceptive available.

**Key words:** Pelvic inflammatory disease, contraceptive methods.

### ÖZET

**Amaç:** Pelvik inflammatuar hastalık (PIH) alt genital sistemden köken alan mikroorganizmaların üst genital organları enfekte etmesiyle sonuçlanan sık görülen jinekolojik bir durumdur. Bu çalışmada kesitsel olarak pelvik inflammatuar hastalık tanısı almış hastaların kontraseptif metodlar ve hayat tarzları ile ilişkisi araştırıldı.

**Gereç ve Yöntem:** Çalışma Ocak-Mayıs 2009 tarihleri arasında Başkent Üniversitesi Alanya Uygulama ve Araştırma Merkezine jinekolojik nedenlerle başvurmuş hastalarla yapıldı. Jinekolojik şikayetler ile başvurup PIH tanısı almış 137 hasta PIH grubu ve PIH dışında tanısı almış 108 hasta kontrol grubu olarak değerlendirildi. Hastalar kullandıkları kontraseptif metod, ilk cinsel deneyim, partner sayısı ve genital hijyen gibi bilgilerin değerlendirildiği ayrıntılı bir anket doldurularak değerlendirildi.

**Bulgular:** Gruplar demografik özellikler açısından benzerdi. Rahim içi araç (RİA) kullanan ve oral kontraseptif kullanan hasta sayısı PIH grubunda fazlaydı. Alkol kullanımı ve sigara kullanımı PIH grubunda anlamlı ölçüde fazlaydı. Her iki grupta da çalışmaya dahil olmadan önceki 4 hafta içinde yeni partner ve ya birden fazla partner öyküsü olan hasta yoktu.

**Sonuç:** Bizim çalışmamızın verileri RİA kullanımının üst genital sistemdeki enfeksiyonların şiddetini etkilediğinden dolayı semptomatik PIH olgularıyla daha sık birliktelik gösterdiğini desteklemektedir. Alkol ve sigara kullanımı da PIH insidansını artırmaktadır. Ancak servikal enfeksiyon olmadığı takdirde PIH olması ihtimali düşük olduğundan RİA hala en kabul edilebilir kontraseptif metod gibi görünmektedir.

**Anahtar Kelimeler:** Pelvik inflammatuar hastalık, kontraseptif metodlar.

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Pelvic inflammatory disease (PID) is a common condition in which microorganisms colonizing the lower genital tract ascend to infect and inflame upper genital tract structures including endometrium, tubes, ovaries, and the peritoneum (1).

PID is commonly caused by the sexually transmitted microorganisms *N. gonorrhoeae* and *C. trachomatis*, but aerobic and anaerobic microorganisms from the normal vaginal and cervical flora (such as *Prevotella* or *G. vaginalis*) can also cause PIDs or are found together with *N. gonorrhoeae* and *C. Trachomatis* (2-4).

Traditionally, the diagnosis of PID has been based on a triad of symptoms and signs, including pelvic pain, cervical motion and adnexal tenderness, and the presence of fever. It is now recognized that there is wide variation in many symptoms and signs among women with PID, which make the diagnosis difficult.

Factors associated with clinically manifest PIDs are age, socioeconomic and marital status, number of sexual partners, contraceptive use, smoking and lower genital tract infections. Some of these factors are markers of risk rather than causal factors (2,5-7).

Previous studies suggest that hormonal and barrier methods of contraception may have some protective effect against PID. Yet there is substantial controversy surrounding their relationship to the condition. In one major retrospective study, barrier methods including male condoms has been shown to reduce the risk of PID, but another study found no reduction in the risk (8). In recent prospective cohort studies, it was reported that condom use have been less than optimal in preventing the sexually transmitted diseases (9,10). In the same way, Oral contraceptives increase the rates of chlamydial cervicitis but have been shown to reduce the risk of symptomatic PID (11-13). These observations support the need to re-evaluate contraceptive methods as related to PID.

In this study, we examined cross-sectionally women with the diagnosis of PID and relation with contraceptive methods and life-style habits.

## METHODS

This was a cross-sectional study carried out from January 2009 to May 2009 at Baskent University Alanya Medical & Research Center.

One-hundred and fortyfive women who attended to hospital for gynecological complaints and diagnosed as PID and 108 women who had a diagnosis other than PID were recruited to this study. The women were subjected to a detailed, structured written questionnaire, including current contraceptive use, first intercourse, intercourse with another partner, details on sexual practices, partnerships, genital hygiene, and demographic factors were ascertained and their consent was obtained along with the questionnaire.

Of the 145 women with PID asked to participate, 137 were eligible as PID group and 108 women with diagnosis other than PID were tested as control group for the final analysis. For analysis only the woman's current method of contraception was considered. The current method was defined as that which was used anytime during the three months before attendance. A woman was considered to be using no current method of contraception if she used no method during each of the three months before attendance. The duration of use of current contraceptive method was recorded. Exclusion criteria as follows: history of repeat episodes of PID (etiology of current episodes may differ from primary episodes), sexual inactivity for the previous six months, amenorrhea for the previous three months, pregnancy within previous three months.

Diagnostic PID symptoms based on CDC criteria (2006) was accepted as: pelvic or lower abdominal pain, if no other cause for the illness other than PID can be identified and if one or more of the following minimum criteria are present on pelvic examination: cervical motion tenderness, uterine tenderness or adnexal tenderness.

The materials was computerized and analyzed with SPSS 11.0 statistical program. The differences between groups were analyzed with the chi-square test for categorical variables. Demographic variables were analyzed with student- t test.  $p < .05$  was considered statistically significant.

## RESULTS

Women with the diagnosis of PID and women in the control group were similar ages ( $32.5 \pm 5.8$  vs  $34.4 \pm 7.8$  years-old age). Most of the women who were enrolled in the study were 25 years old or older, in each

**Table 1**—Characteristics of The Patients

	<b>PID Group (Mean± SD) N: 137</b>	<b>Control Group (Mean±SD) N: 108</b>	<b>p values</b>
Age (year)	32.5± 5.8	34.4± 7.8	0.1
Gravidity	2.3± 1.1	2.0± 1.1	0.1
Parity	1.7± 0.8	1.6±1.1	0.7
Age of partner(year)	38.0± 6.4	39.3±8.1	0.3
Episodes of intercourse/wk	2.2± 1.0	2.2± 1.2	0.7
Duration of marriage(year)	11.8± 5.9	11.0± 8.0	0.5
Duration of use of current contraceptive method(year)	5.2± 4.2	5.2±4.6	0.9

p < .05 was considered as statistically significant

**Table 2**—Frequency of Current Contraceptive Method Within Groups

<b>Current Method</b>	<b>PID Group N: 137 (%)</b>	<b>Control Group N: 108 (%)</b>	<b>p values</b>
IUDs	46 (33.6%)	18 (17.3%)	0.006
OCs	12 (8.8%)	4 (3.8%)	0.006
Barrier method	16 (11.7%)	20 (19.2%)	0.006
No method	63 (46%)	66 (59.6%)	0.006

\* pearson chi-square test, p < .05 was considered as statistically significant.

group 4 patients were younger. The groups were similar for most other demographic variables (Table 1).

Percentage of women with currently using oral contraceptives and IUD users were higher in PID group (Table 2). Moreover among the women in the PID group, frequency of previous history of sexually transmitted disease and PID was significantly higher than control group (p< .05).

The effect of duration of current method was examined and no difference was found between the groups.

In both groups, women had no history of new sexual partner or more than one partner in the 4 weeks before enrollment to the study. Frequency of intercourse found not consistently different between groups.

Both alcohol use and tobacco use were more frequent in the PID group, and statistically significant (Table 3).

In both groups, women and partners were similar educational attainment (Table 3).

**Table 3**—Percent Distribution of Life Style Factors Within Groups

	<b>PID Group</b>	<b>Control Group</b>	<b>p values</b>
History of PID	65 (47.4%)	6 (5.5%)	0.001
History of STD	10 (7.2%)	-	0.001
Current smoker	40 (29.1%)	6 (5.5%)	0.005
Current alcohol use	20 (14.5%)	6 (5.5%)	0.03
Education			
<High school	56 (40.8%)	65 (47.6%)	
High school graduate	16 (11.6%)	44 (42.3%)	
>High school	38 (36.5%)	22 (21.2%)	0.8

p < .05 was considered as statistically significant.

## DISCUSSION

In this analysis relation of contraceptive methods, life-style factors and PID was examined. In the present analysis, study population composed of women who have mutually monogamous relationships ( only one recent sexual partner, married or cohabiting women) so to determine the tendency to diagnose PID among IUD users would be possible. By this way, the most important confounding factors related to sexual behavior, marital status, had been able to control.

Our study is superior to others, it was documented that almost all woman in the present study had single partner within previous six months. It was hypothesized that pelvic inflammatory disease developing in women who are not in mutually monogamous relationships is more likely to be caused by a sexually transmitted pathogen. However, PID developing in women in mutually monogamous relationships is most likely due to their endogenous flora and perhaps IUD facilitate the ascension of lower tract infections due to sexually transmitted organisms, but have no effect on the ascension of infections due to other organisms that are not sexually transmitted (1,14). But in the current study the frequency of the IUD users was higher in the PID group while both group had similar marital status and not support the previous hypothesis. .

We found that in the study group, women using IUDs were greater rate compared to control group. Results from several studies suggest that the greatest risk of pelvic inflammatory disease associated with IUD use occurs shortly after insertion( 14-18). In the present study, IUD had been inserted to 4 women in the study and 3 women in the control groups within previous four months, and this was not statistically significant. Our study agrees with others that have been show the rate of PID was lowest for recent insertions. Our data also indicate that PID risk does not increase with long-term use.

It was also reported that to a lesser extent, frequent sexual intercourse and history of gonorrhea also increased a woman's risk of PID (19,20). In the present study, frequency of history of PID and STDs were both higher in the PID group and this finding was statistically significant whereas frequency of sexual activity was similar in both groups.

Most studies have used inappropriate control groups and have not adjusted adequately for sexual behavioral variables; in this study number of partners in previous six months, frequency of sexual intercourse were similar between groups. However number of women who smoke and use alcohol were higher in PID group. Our study result that both smoking and alcohol increase the risk of PID independently from other risk factors.

In conclusion, our current observations are consistent with the notion that IUD increase symptomatic PID probably affecting the severity of upper genital tract disease, and also current alcohol use and smoking tended to increase the incidence of PID. So women free of cervical infections seem to have the lowest risk of upper genital tract infections associated with IUD and IUD still appear to be most acceptable modern contraceptive available.

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