

## Laparoscopic Assessment of Pelvic Inflammatory Diseases Among IUD Users<sup>1)</sup>

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### ABSTRAK

Ibnu Pranoto, Mochamad Anwar dan Mochamad Rois Ma'mun - *Penentuan penyakit radang panggul pada pemakai IUD dengan laparoskopi.*

Penyakit Radang Panggul (PRP) adalah salah satu komplikasi terpenting yang terjadi pada pemakaian IUD. Telah diteliti 390 calon akseptor sterilisasi ligasi tuba secara laparoskopi, dengan perincian 194 kasus (49,7%) akseptor IUD dan 196 (50,3%) bukan akseptor IUD; dilakukan eksplorasi rongga panggul untuk melihat adanya PRP sebelum dilakukan sterilisasi ligasi tuba.

Didapat angka risiko relatif 95% PRD pada akseptor IUD sebanyak 2,52 dibanding dengan non-IUD. Makin lama pemakaian IUD, makin besar risiko terjadinya PRP dan kenaikan yang tajam PRP setelah pemakaian 2 tahun. Insersi IUD oleh bidan atau dokter umum mempunyai risiko hampir sama untuk terjadinya PRP. Bila insersi dilakukan dengan tempat dan peralatan medis yang kurang baik, maka risiko kejadian PRP lebih besar.

Disimpulkan bahwa laparoskopi eksplorasi memberikan keuntungan yang lebih dalam mendiagnosis PRP, terutama yang secara klinis tidak dapat ditentukan.

*Key Words:* pelvic inflammatory disease - laparoscopic sterilization - IUD - family planning program - gynaecology

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### INTRODUCTION

Pelvic inflammatory disease (PID) is one of the most important complications which occurred following the use of an IUD. There are at least 16 published epidemiological studies showing the correlation between IUD insertion and the incidence of PIDs (Senayake & Kramer, 1980). However, clinical assessment of PIDs are not always easy, especially if the disease is mild or symptomless.

The accuracy of diagnosis of PID is mandatory, as it often results in severe long term sequelae such as infertility, ectopic pregnancy, chronic pelvic pain and the possibility of recurrent infection.

Laparoscopic exploration, as a routine procedure for abnormality detection in visceral organ, plays an important role in gynaecological diagnosis. The

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Fallopian tubes, Douglass cavity, broad ligament and the entire surface of both ovaries can be viewed readily unless masked by lesions or infection. Thus, laparoscopy can be used for the assessment of PIDs.

This study was conducted to identify the incidence of PIDs among IUD users through laparoscopic assessment.

## SUBJECT AND METHOD

The study was conducted in 5 hospitals and one health center in the southern part of Central Java. In these hospitals, family planning services are a routine program, including laparoscopic tubal ligation done by a gynaecologist. In the health center involved in the study laparoscopic sterilization services are done by the mobile team from Dr. Sardjito General Hospital.

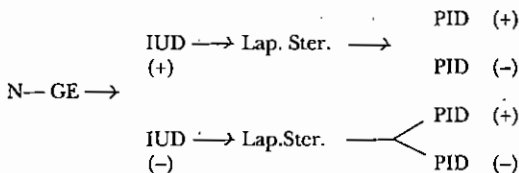
A preliminary meeting among gynaecologists and staff of the 5 hospitals was conducted to understand the purpose and efficacy of the study program, how to complete the forms and the diagnosis criteria of PID.

The subjects included in this study were all volunteer women who were willing to have laparoscopic tubal ligation. Before operation, gynaecological examination was done to identify any possible laparoscopic contraindications and to confirm the presence of IUD as it should be removed before operation.

Laparoscopic diagnostic categories of PID are as follows: *mild form* (characterized by hyperemic tubal surface, edematous or swollen, movable tubae, and patent tubal ostia), *moderate form* (characterized by apparently hyperemic and swollen tubae, purulent exudate from ostium abdominale tubae, and patent tubae, unmovable tubae and undetermined tubal patency) and *severe form* (characterized by pelvic peritonitis, pyosalpinx or abscess formation. Obscured visualization of all internal genital organs occurs due to threads of adhesion).

## RESULTS AND DISCUSSION

From the period of November 1985–1986 there were 390 cases in which 194 cases were IUD users (49.3%) and 196 cases were IUD non-users (50.3%). The IUD non-users consist of those taking pills, injectable contraceptives, condoms or without any contraception at all.



N = women who are willing to have laparoscopic sterilization.  
 GE = Gynaecological Examination

In the laparoscopic procedure, if adhesion of internal organs was severe, the sterilization was carried out by conventional minilaparotomy method. Two cases of severe PID with severe adhesion were found in the IUD users group.

Among these 390 subjects, 144 cases suffered PID (36.92%), whereas 246 cases were from non-PID (63.07%) (TABLE 1).

TABLE 1.— Diagnosed by laparoscopic examination

PID (-)	246 (63.07%)
Mild	128 (32.82%)
Moderate	14 ( 3.59%)
Severe	2 ( 0.51%)
Total	390

The frequency of mild PID cases were 85.44% in the IUD users and 88.89% in the non-users group.

TABLE 2. — The characteristic features of the two groups

Characteristic	% of IUD Users (194)	% of IUD Non-Users (196)	Significance
<i>Age</i>			
< 20	0.51	1.01	
21 – 29	—	—	
30 – 35	26.29	23.98	
> 35	14.95	10.72	
Average	31.85 + 4.34	31.49 + 3.79	NS
<i>Live birth</i>			
> 2	4.12	4.08	
3 – 5	79.90	81.12	
> 6	15.98	14.79	
Average	4.02 + 1.39	4.18 + 1.38	NS
<i>Education</i>			
Uneducated	14.69	13.26	
1 – 3 years	13.40	15.31	
4 – 5	56.18	56.16	
> 6	13.92	13.26	
Average	4.84 + 2.98	4.99 + 2.88	NS
<i>History of previous pregnancies</i>			
Good <sup>1)</sup>	95.36	96.43	
Bad <sup>2)</sup>	4.64	3.57	NS
<i>Occupations</i>			
Unemployed	9.28	9.18	
Farmer	79.90	75.00	
Trader	5.69	7.14	
Government official	3.10	5.61	
Private	2.06	3.06	

NS = Non-significant

1) = Appropriate for gestational age

2) = Inappropriate for gestational age or abortion

TABLE 3. - Correlation between IUD and PIDs

Characteristic	PIDs		IUD		Total
	n	%	n	%	
IUD	103	53.09	91	46.91	194
Non-IUD	41	20.92	155	79.08	196
		$\chi^2 = 43.34$	df = 1	p < 0.005	

Relative risk rate of PIDs in the IUD users and IUD non-users groups is 2.52. This difference was statistically of high significance ( $p < 0.005$ ). This result is in accordance with the results of previous studies on the correlation of IUD insertion and PIDs which concluded that the risk rate of PIDs in the IUD users was greater than in the non-users group.

According to Ory (1978) the relative risk rate of PIDs in the IUD users was 3-5 times greater than in the non-users group. Some other studies revealed relative risk rate of PIDs in the IUD users versus the non-users was 3-7 times greater (Kaufman *et al.*, 1980; Westroom *et al.*, 1976; Wright & Laemle, 1968).

Burkman's study (1981) in 16 hospitals of 9 cities in the United States concluded that the IUD users have relative risk rate of PID 1.6 in comparison with the non-users. Osser *et al.* (1980) concluded that the relative risk rate of IUD users to develop PIDs was 2.1.

TABLE 4. - Correlation between duration of using IUD and PIDs.

Period of Using IUD (in months)	PIDs		Non-PIDs		Total
	n	%	n	%	
< 6	17	44.74	21	55.26	38
7 - 12	26	49.06	27	53.94	53
13 - 24	17	41.46	24	58.54	41
> 25	43	46.35	19	30.65	62
		$\chi^2 = 10.22$	df = 3	p < 0.025	

The difference between the duration of using IUD and the occurrence of PIDs was statistically significant ( $p < 0.025$ ). The relative risk rate of the duration of using IUD for 7-12 months, 13-24 months and more than 24 months period are 1.09, 0.91 and 1.54 respectively. From TABLE 4, it can be shown that the duration of using IUD for more than 2 years has the greatest risk for PIDs. It may be due to the invasion of vaginal bacteria into the uterine cavity through the thread of IUD (Davis, 1972; Eschenbach, 1985; Flesh *et al.*, 1979; Sadmire & Cavanagh, 1985; Westroom *et al.*, 1976).

The result of this study was in accordance with the previous study done by Kaufman *et al.* (1980) in 43 IUD users with PIDs. His study revealed that the duration of more than 5 years of using IUD has a greater risk of PIDs than the duration of less than 5 years. These relative risk rates were 12.9 and 5.7 respectively. FIGURE 1 shows the graph of probability of PIDs in correlation with the duration of using IUD. It is clearly shown that the probability of PIDs sharply increases after 2 years of usage and the highest point is on the use for 25 months or more.

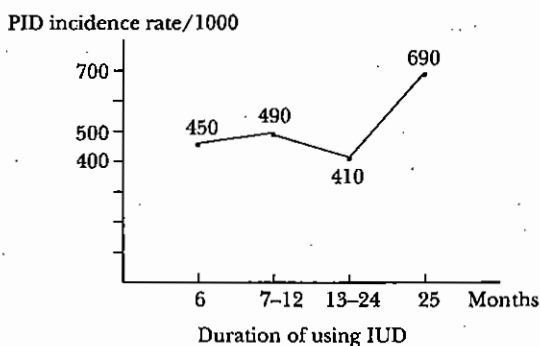


FIGURE I. - Correlation between the probability of PIDs and the duration of using IUD

TABLE 5. - Correlation between provider of IUD insertion and PIDs

Provider	PIDs		Non-PIDs		Total
	n	%	n	%	
Midwife	94	52.81	84	47.19	178
Doctor	9	56.25	7	43.75	16
		$\chi^2 = 0.07$	$df = 1$		$p > 0.5$

Relative risk rate of IUD insertion by midwife in comparison to doctor = 0.95.

TABLE 5 shows that the PID relative risk of IUD inserted by a midwife and a doctor is 0.95. This discloses that IUD inserted by a midwife and a doctor may have nearly the same risk for the development of PIDs. It is reasonable, since midwives are aware in conditions prone to sepsis, antiseptic conditions, and in the administration of prophylactic antibiotic after insertion. The study of Einhorn *et al.* (1977) in a family planning clinic in Bogota on the correlation between methods of contraception and the type of provider found that the survival rate of using IUD inserted by the nurse and the doctor showed statistically no difference. Wright and Laemle (1968) also found that the survival rate of using IUD inserted by a midwife assistant was similar to that inserted by a doctor. Most of the acceptors (98.18%) were IUD-inserted in health centres with adequate health facilities and hospitals. Only a few of them (1.82%) were inserted in a Village Meeting Place with less adequate health facilities (TABLE 6).

TABLE 6. - Correlation between the area of IUD service and PIDs

Service Place	PIDs		Non-PIDs		Total
	n	%	n	%	
Balai desa/Kelurahan	14	66.67	7	33.33	21
Health center	89	51.45	84	48.55	173
		$\chi^2 = 1.74$	$df = 1$		$p > 0.1$

Relative risk of IUD in Village Meeting Place = 1.31.

Although the difference of both health services were statistically insignificant ( $p > 0.1$ ), the relative risk rate of IUD insertion for PIDs in the Village Meeting Place was 1.3 times greater than in the Health Centre, and this was due to the limited sterile facilities. This result is apparently a little bit different from the result of Anwar (1986) who did a comparative study of IUD insertion in Health Centres with complete and incomplete facilities. The study showed that there were no serious infections and no IUD extraction due infection found in both kinds of Health Centre. This difference might be due to the laparoscopic diagnosis of PIDs (Jacobson & Westroom, 1969). More than half of the IUD were inserted in 40 days after labor, and the rest were inserted before, after, and during menstruation (TABLE 7).

TABLE 7. - Correlation between the time of insertion and PIDs

Time of Insertion	PIDs		Non-PIDs		Total
	n	%	n	%	
40 days postpartum	59	53.64	51	46.3	110
during M	26	45.61	31	54.39	57
before M	10	66.67	5	33.33	15
after M	8	66.67	4	33.33	12
$\chi^2 = 1.74$		df = 1		p > 0.1	

Relative risk rate of PIDs: before menstruation 1.46; during menstruation 1.46; 40 days after labor 1.17

There were no significant differences among the four sets of time of insertion ( $p > 0.10$ ). These relative risk rates of PIDs in the IUD insertion before, and during menstruation, and 40 days after labor were not so highly different. The above result shows that IUD insertion done at any time during the interval period and post-partum has relatively the same risk for PIDs. The above result is in accordance with the result of Brayoon's study (1986) who concluded that there was no significant difference in the risk of PIDs whether the IUD insertion was done after labor or at interval periods. But Moyer *et al.* (1980) confirmatively stated that the insertion of IUD in the late luteal phase (around the 22nd day after menstruation) would end up with IUD extraction due to the established inflammation, 3 times greater than at other times of insertion.

There were 3 kinds of IUD preferred by the acceptors in this study: Lippes loop, MLCU-250, and Copper T-200B, and the majority preferred the Lippes loop (88.14%), followed by MLCU-250 (9.28%), and Copper T-200B (2.58%) (TABLE 8).

TABLE 8. - Correlation of the used IUD types and PIDs

Types of IUD	PIDs		Non-PIDs		Total
	n	%	n	%	
Lippes Loop	92	53.80	79	46.20	171
MLCU-250	9	50.00	9	50.00	18
Copper T.200B	2	40.00	3	60.00	5
$\chi^2 = 0.45$		df = 2		p > 0.5	

Relative risk rate of PIDs for: MLCU-250 = 0.93, Copper T-200 B = 0.74

There were no significant differences of PIDs in these three group of IUD users ( $p>0.05$ ). The relative risk rate of PIDs in MLCU-250 and Copper T-200B were 0.93 and 0.74 respectively. Although this difference was not significant, Copper-IUD can reduce the incidence of PIDs by 0.5 compared to Lippes loop.

Some authors found that the relative risk rate of PIDs in Copper-IUD was lower than Lippes loop type (Burkman, 1981; Kaufman *et al.*, 1980; Lee *et al.*, 1983).

The high relative risk rate of PIDs in the Copper-IUD group may be due to inhibitory effect of cuprum ions to the proliferation of gonorrhoeal bacteria (Moyer *et al.*, 1980) as an etiologic factor of PIDs.

## SUMMARY

A cross-sectional study of laparoscopic assessment of PIDs among IUD users is a highly more valuable procedure than clinical assessment. This study confirmed that IUD was a high risk factor for PIDs. The duration of more than 2 years of using IUD showed a two-times greater risk. IUD inserted by a midwife or a doctor showed a similar risk of PIDs. IUD insertion done with incomplete facilities (*Balai Desa* or *Balai Kelurahan*) showed a greater risk for PIDs than with complete facilities (hospitals and community health centres). IUD inserted at interval period of 40 days after labor showed relatively similar risk of PIDs. Copper-IUD (MLCU and Copper T-200B) can reduce the risk of PIDs.

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