Effect of Tubal Ligation on Pelvic Endometriosis Externa in Multiparous Women with Chronic Pelvic Pain

Sopon Cheewadhanaraks MD*

** Department of Obstetrics and Gynecology, Faculty of Medicine, Prince of Songkla University*

Objective : *To determine whether tubal ligation is associated with decreased prevalence and less severity of pelvic endometriosis in multiparous patients with chronic pelvic pain.*

Material and Method : *From January 1995 to April 2002, 322 chronic pelvic pain patients underwent laparoscopy. Of these, 125 patients were multiparous (parity ≥ 2). Their obstetric history, present contraceptive methods and laparoscopic findings were recorded perioperatively. The medical record of each patient was reviewed and analyzed.*

Results : *Among multiparous women with chronic pelvic pain, the prevalence of endometriosis in patients with and without tubal ligation was 45.1% (23 of 51 patients) and 59.5% (44 of 74 patients), respectively. Moderate-severe endometriosis was found in 8.7% (2 of 23 patients) and 36.4% (16 of 44 patients) among patients with and without sterilization. Tubal ligation was statistically significantly associated with severity of disease [P = 0.036, Crude OR (95% CI) = 0.17 (0.02-0.85), Adjusted OR (95% CI) = 0.21 (0.04-1.08)]. There was no statistically significant relationship between tubal ligation and prevalence of endometriosis. The small sample size of the study might account for this statistical result.*

Conclusion : *Nearly half of multiparous women with chronic pelvic pain and tubal ligation had endometriosis. Tubal ligation was related to less severity of disease, with statistically significant difference.*

Keywords : *Chronic pelvic pain, Endometriosis, Multiparous, Tubal ligation*

J Med Assoc Thai 2004; 87(7): 735-9

There are many theories explaining the histogenesis of endometriosis. The implantation theory of Sampson[1] is the most widely accepted one, concerning the histogenesis of pelvic endometriosis. This theory requires patency of at least one fallopian tube for retrograde menstruation to occur. Tubal ligation or sterilization is aimed to occlude the tubal lumen and consequently results in complete tubal occlusion unless recanalization develops or tubo-peritoneal fistula occurs. After sterilization, menstrual reflux is almost totally interrupted and very few new endometrial cells have the opportunity to gain access and implant in peritoneal surface. Thus, tubal ligation may have the effect on prevalence and/or severity of endometriosis. Nevertheless, Fakih et al[2] reported that 23 (27.3%) of 84 patients discharged with the diagnosis of endometriosis had undergone tubal ligation before this diagnosis was made.

The aim of the present study was to determine whether tubal ligation is associated with decreased prevalence and less severity of pelvic endometriosis in painful multiparous patients.

Correspondence to : Cheewadhanaraks S. Department of Obstetrics and Gynecology, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla 90110, Thailand. Phone: 0-7442-9617, Fax: 0-7442-9617, E-mail: csophon@medicine.psu.ac.th

Material and Method

From January 1995 to April 2002, 322 chronic pelvic pain patients underwent laparoscopy at Prince of Songkla University Hospital. Of these, 125 were multiparous (parity ≥ 2). The authors' definition of chronic pelvic pain is nonmenstrual pain of at least 3 months' duration or menstrual pain of at least 6 months' duration, causing functional disability or requiring treatment. The patients' obstetric history, present contraceptive methods and laparoscopic findings were recorded perioperatively. The medical record of each patient was reviewed. None of the patients had previously documented diagnosis of the etiology of chronic pelvic pain before the operation.

The diagnosis of endometriosis was made when typical lesions were visualized. Biopsy and histologic confirmation were performed only when atypical lesions were found. The severity of endometriosis was staged according to the revised classification of the American Fertility Society[3]. Only when hydrosalpinx or hydrosalpinges were found, without endometriotic lesion patients were diagnosed to have chronic pelvic inflammatory disease (chronic PID). Adenomyosis was differentiated from myoma uteri by ultrasonogram.

Each patient was assigned to one of the four groups, namely group I: tubal ligated patients with endometriosis (TL, Endometriosis), group II: tubal ligated patients without endometriosis (TL, non-Endometriosis), group III: non-tubal ligated patients with endometriosis (non-TL, Endometriosis), and group IV: non-tubal ligated patients without endometriosis (non-TL, non-Endometriosis).

Unpaired Student's t-test was used to analyze clinical characteristics, age at the time of sterilization and interval since sterilization. Likelihood ratio test, univariate and multivariate logistic regression model were used to analyze the association between the presence of endometriosis and tubal ligation, and also between severity of disease and sterilization. *P*-value < .05 was considered statistically significant.

Results

Two hundred and three (63.0%) of 322 patients had pelvic endometriosis. Sixty-seven (53.6%) of 125 patients with parity $\geq$ 2, had endometriosis. The age and parity of these patients are presented in Table 1. Fifty-one (40.8%) of 125 multiparous patients previously underwent tubal ligation. Forty-one patients had postpartum abdominal tubal ligation with Pomeroy technique. The other 10 patients had interval laparoscopic tubal ligation with Fallope rings. The age at the time of sterilization and interval since sterilization are presented in Table 2. There was statistically significant difference between the patients with and without endometriosis.

The prevalence of endometriosis among patients with and without tubal ligation were 45.1% (23 of 51 patients) and 59.5% (44 of 74 patients), respectively. Among patients with and without sterilization, moderate-severe endometriosis were 8.7% (2 of 23 patients) and 36.4% (16 of 44 patients), respectively. The laparoscopic findings of multiparous patients are presented in Table 3. In TL, Endometriosis group, 2 patients had minimal-mild endometriosis combined with adenomyosis. In non-TL, Endometriosis group, 1 patient who had minimal-mild endometriosis, also had adenomyosis. The present contraceptive methods of the patients, who had not undergone tubal ligation, are presented in Table 4.

Table 5 shows the relationship between tubal ligation and prevalence, and severity of endometriosis. Tubal ligation was statistically significantly associated with severity of disease (P = 0.036). However, sterilization was not statistically significantly related to prevalence of endometriosis.

Discussion

Among chronic pelvic pain patients including nulliparous and parous women, the prevalence of endometriosis was 63.0% in the present study. Among multiparous patients with chronic pelvic pain the prevalence of endometriosis was 53.6%. Furthermore, in the subgroup including only the previously sterilized patients, the prevalence was 45.1%. In contrast, Sangi-Haghpeykar and Poindexter[4] reported that among multiparous women, the prevalence of asymptomatic endometriosis was 3.7% (126 of 3,384 women). Moen and Stokstad[5] found that women with asymptomatic endometriosis diagnosed at sterilization did not report pain more often than controls without endometriosis in a follow-

Table 1. Clinical characteristics of multiparous patients (n = 125)

	With endometriosis (n = 67) Mean ± SD	Without endometriosis (n = 58) Mean ± SD	*P*-value
Age (years)	37.3 ± 4.8	38.9 ± 6.8	0.125
Live births (n)	2.3 ± 0.6	2.5 ± 0.8	0.212

Table 2. Age at the time of sterilization and interval since sterilization among patients with and without endometriosis (n = 51)

	With endometriosis (n = 23) Mean ± SD	Without endometriosis (n = 28) Mean ± SD	*P*-value
Age at sterilization (years)	30.2 ± 2.8	27.3 ± 3.7	0.003
Interval since sterilization (years)	8.2 ± 4.1	12.8 ± 6.5	0.006

Table 3. Laparoscopic findings of multiparous patients (n = 125)

	TL†, Endometriosis Group (n = 23) n (%)	Non-TL, Endometriosis Group (n = 44) n (%)	TL, Non-Endometriosis Group (n = 28) n (%)	Non-TL, Non-Endometriosis Group (n = 30) n (%)
Minimal-mild endometriosis	21 (91.3)	28 (63.6)	0	0
Moderate-severe endometriosis	2 (8.7)	16 (36.4)	0	0
Chronic PID	0	0	0	7 (23.3)
Adhesions	0	0	8 (28.6)	2 (6.6)
No visible pathology	0	0	14 (50.0)	16 (53.3)
Ovarian cyst	0	0	0	2 (6.6)
Myoma	0	0	3 (10.7)	2 (6.6)
Adenomyosis	0	0	3 (10.7)	1 (3.3)

† TL, tubal ligation

Table 4. Present contraceptive methods of non-Tubal ligation multiparous patients (n = 74)

	Endometriosis group (n = 44) n (%)	Non-Endometriosis group (n = 30) n (%)
Vasectomy	12 (27)	4 (13)
Male condom	6 (14)	4 (13)
Withdrawal	6 (14)	4 (13)
Pills	4 (9)	3 (10)
Injectable	1 (2)	3 (10)
Implant	1 (2)	0
Intrauterine device	1 (2)	1 (3)
No contraception	13 (30)	11 (37)

Table 5. Tubal ligation in relation to prevalence and severity of endometriosis

	CrudeOR (95% CI)	Adjusted† OR (95% CI)	*P*-value
Prevalence			
With endometriosis	0.56 (0.26-1.22)	0.64 (0.30-1.37)	0.250
Without endometriosis	1.0	1.0	
Severity			
Moderate-severe	0.17 (0.02-0.85)	0.21 (0.04-1.08)	0.036
Minimal-mild	1.0	1.0	

† controlling for age and number of live births; odd ratio of 1.0 was assigned to the reference group

up study performed 12-15 years later. Thus, it seems that symptomatic and asymptomatic endometriosis in multiparous women might not be the same clinical entity. Moreover, asymptomatic endometriosis without endometrioma in multiparous women needs no treatment; even the diagnosis of the disease has limited benefit for these patients.

After tubal sterilization, endometriosis at the proximal tubal stumps and tuboperitoneal fistulas were found in 0-50%[6-8] and 28%[6] of the studied tubes, respectively. In the present study, tubal endometriosis and tuboperitoneal fistulas were not investigated. However, Stock[7] could not relate tubal endometriosis to post-tubal ligation pelvic pain. Moreover, Rock et al[6], by careful inspection of the pelvis at the time of tubal anastomosis operation, could not find evidence of peritoneal or ovarian endometriosis in 25 patients, whose 14 of 50 fallopian tubes revealed tubo-peritoneal fistulas.

Long episodes of regular, prolonged, abundant menstrual flows are generally agreed to increase the risk of endometriosis. Since oral contraceptive combined pills and depot medoxy-progesterone acetate reduce and intrauterine device increase menstrual flow, an effect on the risk of development of endometriosis in women utilizing these forms of contraception could be expected. Nevertheless, analysis of epidemiological observations shows no concensus on a possible relationship between the risk of endometriosis and use of cyclic oral contraceptives[9-12], depot medroxy-progesterone acetate[4] or intrauterine device[9,11]. Therefore, in the present study, all contraceptive methods were grouped together as controls, as well as vasectomy and no contraception.

Fakih et al[2] observed that 23 (27.3%) of 84 patients discharged with the diagnosis of endometriosis had undergone tubal ligation before

this diagnosis was made. Twenty of the 23 women had symptoms consistent with endometriosis. Unfortunately, they did not describe the symptoms and parity of the remaining 61 patients without tubal sterilization.

Interestingly, after tubal ligation for 8.2 $\pm$ 4.1 (mean $\pm$ SD) years, endometriosis was found in 45.1% of the patients. This is more common than previously expected. The prevalence of endometriosis in the patients without sterilization was 59.5%. The small sample size of the study might account for the statistical test result. In contrast, moderate-severe endometriosis was found in only 8.7% of the patients with tubal ligation, compared with 36.4% of the group without sterilization, with statistically significant difference (P = 0.036).

The sterilized patients without endometriosis were younger at the time of sterilization and longer interval since sterilization, with statistically significant difference. Consequently, these patients had a shorter duration of menstrual reflux compared with patients with endometriosis. Thus, these findings support the implantation theory.

When couples request permanent contraception, the option may be female or male sterilization. They should be informed about prevalence and severity of endometriosis after tubal ligation and vasectomy. Age at the time of tubal ligation has at least two consequences. First, post-tubal ligation syndrome, including menstrual dysfunction, dysmenorrhea, or increased premenstrual distress, has been reported in younger women, who undergo sterilization between 20 and 29 years of age[13]. Second, on the contary, the present study showed that women, who had endometriosis, were older at the time of sterilization.

Stovall et al[14] reported that endometriosis-associated chronic pelvic pain commonly persists throughout the reproductive years and that endometriosis stage is directly related to the persistence of pelvic pain. Thus, patients with tubal ligation, having less stage, might have less risk of persistence of pain. Nevertheless, further studies are warranted.

In conclusion, nearly half of multiparous women with chronic pelvic pain and tubal ligation had endometriosis. Tubal ligation was associated with less severity of disease, with statistical significance.

Acknowledgment

The author wishes to thank Dr. Alan Geater for his helpful statistic analysis.

References

1. Sampson JA. Peritoneal endometriosis due to menstrual dissemination of endometrial tissue into the peritoneal cavity. Am J Obstet Gynecol 1927; 14: 422-69.
2. Fakih HN, Tamura R, Kesselman A, DeCherney AH. Endometriosis after tubal ligation. J Reprod Med 1985; 30: 939-41.
3. American Fertility Society. Revised classification of endometriosis. Fertil Steril 1985; 43: 351-2.
4. Sangi-Haghpeykar H, Poindexter AN 3rd. Epidemiology of endometriosis among parous women. Obstet Gynecol 1995; 85: 983-92.
5. Moen MH, Stokstad T. A long-term follow-up study of women with asymptomatic endometriosis diagnosed incidentally at sterilization. Fertil Steril 2002; 78: 773-6.
6. Rock JA, Parmley TH, King TM, Laufe LE, Su BS. Endometriosis and the development of tuboperitoneal fistulas after tubal ligation. Fertil Steril 1981; 35: 16-20.
7. Stock RJ. Postsalpingectomy endometriosis: a reassessment. Obstet Gynecol 1982; 60: 560-70.
8. Donnez J, Casanas-Roux F, Ferin J, Thomas K. Tubal polyps, epithelial inclusions, and endometriosis after tubal sterilization. Fertil Steril 1984; 41: 564-8.
9. Vercellini P, Ragni G, Trespidi L, Oldani S, Crosignani PG. Does contraception modify the risk of endometriosis? Hum Reprod 1993; 8: 547-51.
10. Parazzini F, Di Cintio E, Chatenoud L, Moroni S, Mezzanotte C, Crosignani PG. Oral contraceptive use and risk of endometriosis. Italian Endometriosis Study Group. Br J Obstet Gynaecol 1999; 106: 695-9.
11. Parazzini F, Ferraroni M, Bocciolone L, Tozzi L, Rubessa S, La Vecchia C. Contraceptive methods and risk of pelvic endometriosis. Contraception 1994 ; 49: 47-55.
12. Darrow SL, Selman S, Batt RE, Zielezny MA, Vena JE. Sexual activity, contraception, and reproductive factors in predicting endometriosis. Am J Epidemiol 1994; 140: 500-9.
13. Gentile GP, Kaufman SC, Helbig DW. Is there any evidence for a post-tubal sterilization syndrome? Fertil Steril 1998; 69: 179-86.
14. Stovall DW, Bowser LM, Archer DF, Guzick DS. Endometriosis-associated pelvic pain: evidence for an association between the stage of disease and a history of chronic pelvic pain. Fertil Steril 1997; 68: 13-8.

ผลของการทำหมันหญิงที่มีต่อภาวะเยื่อบุโพรงมดลูกเจริญผิดที่บริเวณอุ้งเชิงกรานในสตรีที่มีอาการปวดท้องน้อยเรื้อรังและมีบุตรหลายคน

โสภณ ชีวะธนรักษ์

วัตถุประสงค์ *: เพื่อศึกษาความสัมพันธ์ระหว่างการทำหมันหญิงกับการลดความชุกและความรุนแรงของภาวะเยื่อบุโพรงมดลูกเจริญผิดที่บริเวณอุ้งเชิงกรานในผู้ป่วยที่มีอาการปวดท้องน้อยเรื้อรังและมีบุตรหลายคน*

วัสดุและวิธีการ *: ตั้งแต่เดือนมกราคม ค.ศ.1995 จนถึงเดือนเมษายน ค.ศ. 2002 ผู้ป่วยที่มีอาการปวดท้องน้อยเรื้อรังจำนวน 322 ราย ได้รับการส่องกล้องตรวจ จากผู้ป่วยกลุ่มนี้มีผู้ป่วย 125 ราย ที่มีบุตรหลายคน (2 คน หรือมากกว่า) ได้มีการบันทึกประวัติทางสูติศาสตร์ วิธีการคุมกำเนิดที่กำลังใช้และผลการตรวจพบจากการส่องกล้องในช่วงเวลาก่อนและหลังการผ่าตัด ผู้วิจัยได้ศึกษาเวชระเบียนของผู้ป่วยแต่ละราย รวมทั้งทำการวิเคราะห์*

ผลการศึกษา *: กลุ่มสตรีที่มีอาการปวดท้องน้อยเรื้อรังและมีบุตรหลายคน พบความชุกของภาวะเยื่อบุโพรงมดลูกเจริญผิดที่ 45.1% (23 ราย จาก 51 ราย)ในผู้ป่วยที่ทำหมันแล้ว และ 59.5% (44 ราย จาก 74 ราย)ในผู้ป่วยที่ยังไม่ได้ทำหมัน ภาวะเยื่อบุโพรงมดลูกเจริญผิดที่รุนแรงปานกลางและมากพบ 8.7% (2 ราย จาก 23 ราย) ในผู้ป่วยที่ทำหมันแล้ว และ 36.4% (16 ราย จาก 44 ราย) ในผู้ป่วยที่ยังไม่ได้ทำหมัน การทำหมันหญิงมีความสัมพันธ์กับความรุนแรงของโรคอย่างมีนัยสำคัญทางสถิติ [P = 0.036, Crude OR (95% CI) = 0.17 (0.02-0.85), Adjusted OR (95% CI) = 0.21 (0.04-1.08)] ไม่พบความสัมพันธ์อย่างมีนัยสำคัญทางสถิติระหว่างการทำหมันหญิงและความชุกของภาวะเยื่อบุโพรงมดลูกเจริญผิดที่ ซึ่งอาจเป็นเพราะประชากรศึกษามีจำนวนน้อยเกินไป*

สรุป *: ประมาณเกือบครึ่งหนึ่งของสตรีที่มีบุตรหลายคน และมีอาการปวดท้องน้อยเรื้อรังร่วมกับทำหมันแล้ว ตรวจพบว่ามีภาวะเยื่อบุโพรงมดลูกเจริญผิดที่ การทำหมันหญิงมีความสัมพันธ์กับการลดความรุนแรงของภาวะเยื่อบุโพรงมดลูกเจริญผิดที่อย่างมีนัยสำคัญทางสถิติ*