

# Prevalence of Endometriosis in Women Undergoing Surgery for Benign Gynecologic Diseases

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**Objective:** To determine the prevalence of endometriosis among other benign gynecologic diseases and to identify the characteristics of patients at increased risk of concomitant diagnosis before surgery

**Material and Method:** A descriptive cross-sectional study of 331 women with benign gynecologic diseases who underwent surgery in the Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand were included. The subjects were interviewed for demographic data, obstetrics, and medical history. Data from medical records were reviewed and collected. Operative notes and pathological reports were reviewed for the diagnosis of endometriosis. The outcome measurement is the prevalence of endometriosis that was diagnosed by the surgeon from operative finding or pathological report and the characteristics of the patients at increased risk of concomitant diagnosis before surgery.

**Results:** Of the 331 women with benign gynecologic diseases, 101 had coexistent endometriosis. Prevalence of endometriosis in benign gynecologic diseases was 30.5%. Of the 285 women with benign gynecologic diseases that did not have concomitant diagnosis of endometriosis before surgery, endometriosis was found in 55 patients postoperatively. Prevalence of endometriosis in this group was 19.3%. The three most common diseases in women undergoing surgery were uterine leiomyoma, adenomyosis, and benign ovarian cysts, respectively. The coexistence of endometriosis with uterine leiomyoma, adenomyosis, and benign ovarian cysts were 28%, 43.5%, and 50%, respectively. Women with preexisting endometriosis were significantly younger than those with postoperative diagnosed endometriosis.

**Conclusion:** The prevalence of coexistence of endometriosis and benign gynecologic diseases, especially uterine leiomyoma, adenomyosis, and benign ovarian cyst, was high. The diagnosis of concomitant diseases was made intra-operatively and postoperatively in more than half of the cases. Physicians should be concerned about the coexistence of both conditions and put this finding into the preoperative counseling data and definite surgery should be informed in advanced stage of endometriosis.

**Keywords:** Endometriosis, Benign gynecologic diseases, Prevalence

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Endometriosis is one of the most common benign gynecologic diseases affecting 3 to 10% of women of reproductive age<sup>(1)</sup>. The incidence of endometriosis is as high as 70 to 90% in women with chronic pelvic pain<sup>(2)</sup>. Other benign diseases can cause the same symptoms as endometriosis and can be concomitant with endometriosis. However, endometriosis has also been found in asymptomatic women.

Symptoms of endometriosis are chronic pelvic pain, dysmenorrhea, and subfertility. All of the symptoms lead to poor quality of life. Most patients

need long-term treatment, some have side effect of medication and some need invasive surgery or hospitalization.

Several previous studies reported that 12 to 86% of uterine leiomyoma or fibroids were concomitant with endometriosis<sup>(3-6)</sup>. Adenomyosis was found in 75% of women with endometriosis in Nepal<sup>(7)</sup>. Thirty five percent of women with ovarian cysts had the coexistence of endometriosis<sup>(3)</sup>. There was no previous study about the prevalence of endometriosis in women undergoing surgery for benign gynecologic disease before. Thus, the present study aims to determine the prevalence of endometriosis in Thai women undergoing surgery for other benign gynecologic diseases. The results could help physicians to put this finding into the preoperative counseling data. Women with high risk of concomitant disease should

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be informed for treatment of both conditions in the same time.

### Material and Method

The present study was carried out in the Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand, a tertiary care hospital, between July 2011 and June 2012. The study protocol was approved by the Siriraj Institutional Review Board.

The sample size was calculated using the formula to estimating single proportion. When the precision was 0.05,  $\alpha = 0.05$ , and the expected prevalence from the pilot study was 22%, the sample size plus 10% drop out was 290.

All participants were at least 18 years old. They were admitted to Siriraj Hospital for surgeries due to benign gynecologic conditions. The patients who were diagnosed as any types of gynecologic cancer were excluded from the study.

After informed consent was obtained, each participant was interviewed for demographic data, obstetrics, and medical history. Data from medical records were also reviewed and collected. Operative notes and pathological reports were reviewed for the diagnosis of endometriosis. Pre-existing endometriosis was diagnosed when the patient had endometriosis related pain (i.e. progressive dysmenorrhea, dyspareunia), abnormal finding from physical examination (i.e. fixed retroverted uterus, nodularity in cul de sac), or ultrasonography showing endometriotic cyst. Postoperative endometriosis was diagnosed by visualization of clinically evident lesions and/or pathologic study. The outcome measurement is the rate of coexistence of the two conditions and intends to identify the characteristics of the patient population at increased risk for concomitant diagnosis.

The data were analyzed using SPSS for Windows version 17. Descriptive statistics was used to describe demographic characteristics as mean, standard deviations (SD), number, and percentage. The categorical data were analyzed by Chi-square or Fisher's exact test. The continuous data were analyzed using Independent sample t-test or Mann-Whitney test as appropriate. The indicating statistically significant difference data were further analyzed with multivariate analysis, using logistic regression analysis. All statistical tests were two-tailed tests. A  $p < 0.05$  was considered as statistically significant.

### Results

The data of 336 patients with benign gynecologic diseases were obtained and five cases who preoperatively diagnosed dermoid cyst were excluded from the study, as they became endometriotic cyst postoperatively.

Of the 331 patients, 101 had coexistent endometriosis. Prevalence of endometriosis in benign gynecologic diseases was 30.5%. Of the 285 patients with benign gynecologic diseases that did not diagnose endometriosis before surgery, endometriosis was found in 55 patients. Prevalence of endometriosis in this group was 19.3%.

Mean age of 331 patients was  $39.4 \pm 17.4$  years. Mean weight and BMI were  $50.9 \pm 22.7$  kg and  $23.6 \pm 4.6$  kg respectively. Median of parity was one (range 0-5). There was no significant difference in demographic data and symptoms between patients with benign gynecologic diseases alone and those who had coexistent endometriosis, except age and dysmenorrhea (Table 1). Patients with coexistent endometriosis were younger and more proportion of dysmenorrhea than those who had benign gynecologic disease

**Table 1.** Characteristics of 331 patients with benign gynecologic diseases

	Benign gynecologic diseases without endometriosis (n = 230)	Benign gynecologic diseases with endometriosis (n = 101)	p-value
Age (year)	45.5±8.3	43.4±6.9	0.020
Body mass index	23.9±4.7	23.0±4.2	0.097
Parity	1 (0-5)	0 (0-3)	0.085
Pelvic pain	65 (28.3%)	36 (36.0%)	0.161
Dysmenorrhea	87 (37.8%)	52 (51.5%)	0.020
Dyspareunia	14 (6.1%)	5 (5.0%)	0.317
Infertility	17 (7.4%)	13 (13.4%)	0.085

Data were presented in number (%), mean  $\pm$  SD and median (range)

alone. Almost half of coexistence endometriosis was diagnosed before surgery. Patients with pre-existing endometriosis were younger, had lower body mass index (BMI) and had higher percentage of endometriosis related symptoms than those who were diagnosed postoperatively (Table 2). Almost three fourth of them had endometriotic cysts. After multivariate analysis, only age was significantly increased risk of preexisting endometriosis (Table 3).

The three most common benign gynecologic diseases that underwent surgery were uterine leiomyoma, adenomyosis, and benign ovarian cysts, respectively (Table 4).

Uterine leiomyoma was the most common benign gynecologic disease causing women to undergo surgery. Twenty eight percent of cases had coexistence endometriosis. Half of them were diagnosed postoperatively. In patients with benign ovarian cysts group, 50% of them had concomitant

endometriosis. Dermoid cyst was the most common benign ovarian cyst and 30% of them had concomitant endometriosis. Forty three percent of women with adenomyosis had concomitant endometriosis and one third of them were diagnosed postoperatively.

### Discussion

The prevalence of coexistence of endometriosis and benign gynecologic diseases was 30.5%. More than half of coexistence endometriosis were diagnosed postoperatively. Patients with preexisting endometriosis were, on average, aged 6.5 years younger than those who diagnosed postoperatively. Endometriosis has high prevalence in young women so physicians may not think about endometriosis in premenopausal and perimenopausal women. Patients with preexisting endometriosis had higher proportion of pelvic pain and dysmenorrhea than those who were diagnosed postoperatively. This explained why they were not

**Table 2.** Characteristics of patients with pre-existing endometriosis and postoperative diagnosis of endometriosis

	Pre-existing endometriosis (n = 46)	Postoperative diagnosis of endometriosis (n = 55)	p-value
Age (year)	39.9±6.0	46.4±6.6	<0.001
Body mass index	21.9±3.9	23.8±4.2	0.023
Parity	0 (0-3)	0 (0-3)	0.994
Pelvic pain	21 (46.7%)	15 (27.3%)	0.044
Dysmenorrhea	30 (65.2%)	22 (40.0%)	0.012
Dyspareunia	4 (9.5%)	1 (1.8%)	0.163
Infertility	9 (21.4%)	5 (9.1%)	0.143
Endometriotic cyst	33 (71.7%)	0 (0%)	<0.001

Data were presented in number (%), mean ± SD and median (range)

**Table 3.** Characteristics of patients with pre-existing endometriosis and postoperative diagnosis of endometriosis

	Pre-existing endometriosis (n = 46)	Postoperative diagnosis of endometriosis (n = 55)	Odds ratio (95% CI)	p-value
Age				0.001
<45	35 (76.1%)	20 (36.4%)	4.8 (1.9-12.0)	
≥45	11 (23.9%)	35 (63.6%)	1	
Body mass index				0.199
<25	38 (82.6%)	35 (63.6%)	2.0 (0.7-5.5)	
≥25	8 (17.4%)	20 (36.4%)	1	
Pelvic pain				0.301
Yes	21 (46.7%)	15 (27.3%)	1.6 (0.6-4.3)	
No	24 (53.3%)	40 (72.7%)	1	
Dysmenorrhea				0.063
Yes	30 (65.2%)	22 (40.0%)	2.4 (1.0-5.9)	
No	16 (34.8%)	33 (60.0%)	1	

Data were analyzed by logistic regression analysis

**Table 4.** Diagnosis of all patients with benign gynecologic diseases and coexistent endometriosis

Diagnosis	Total (n = 331)		Preoperative diagnosis of benign gynecologic disease alone (n = 285)	
	n (%)	Coexistent endometriosis n (%)	n (%)	Coexistent endometriosis n (%)
Uterine leiomyoma	243 (73.4)	68 (28.0)	211 (74.0)	36 (17.1)
Adenomyosis	46 (13.9)	20 (43.5)	33 (11.6)	7 (21.2)
Benign ovarian cyst	22 (6.7)	11 (50.0)	21 (7.4)	10 (47.6)
Uterine prolapse	13 (3.9)	0 (0)	13 (4.6)	0 (0)
Ectopic pregnancy	4 (1.2)	2 (50.0)	4 (1.4)	2 (50.0)
Endometrial hyperplasia	2 (0.6)	0 (0)	2 (0.7)	0 (0)
Thecoma	1 (0.3)	0 (0)	1 (0.3)	0 (0)

Data were presented in number (%)

Benign ovarian cyst (dermoid cyst 14, serous cystadenoma 3, mucinous cystadenoma 2, corpus luteum cyst 2, simple cyst 1)

diagnosed endometriosis preoperatively. However, one fifth of them had dysmenorrhea and these patients should be suspected for having concomitant endometriosis. Not surprisingly, three fourth of the pre-existing endometriosis group had endometriotic cysts, while none of postoperatively diagnosed endometriosis group did. After multivariate analysis, only age was found to be significant risk for pre-existing endometriosis with odd ratio 4.8 (95% CI 1.9-12.0,  $p = 0.001$ ).

Uterine leiomyoma is the most common indication for hysterectomy. Leiomyomas were reported to be a significant risk factor for the presence of endometriosis in a large epidemiological study<sup>(8)</sup>. Intrinsic molecular aberrations in 17 $\beta$ -hydroxysteroid dehydrogenase and aromatase expression may contribute to the development of both diseases<sup>(9)</sup>. Both are hormone dependent diseases that can cause similar symptoms such as pelvic pain and menstrual abnormalities. The present study found that 28% of the patients who presented for surgical treatment of symptomatic uterine leiomyoma had a concomitant diagnosis of endometriosis. This finding was different from two previous studies that reported the rate of coexistence of both diseases<sup>(3,4)</sup>. In a large multicenter study involving 1,880 subjects with uterine fibroids, conducted in Italy, the investigators reported a 12% coexistence of endometriosis and leiomyoma<sup>(3)</sup>. In a recent study involving 131 patients with symptomatic leiomyoma, conducted in the United States of America (USA), the investigators reported an 86% coexistence of the two conditions<sup>(4)</sup>. The discrepancies among the three studies may be due to route of operation and difference in experience of surgeons and the levels of

hospitals. All patients in the USA study underwent laparoscopy under the guidance of a practitioner with extensive experience in recognizing and diagnosing endometriosis, whereas the patients in the present study and the Italian study underwent a mixture of laparotomy and laparoscopy. Laparoscopy provides better visualization and easier diagnosis than laparotomy. Laparotomy can often underestimate the prevalence of endometriosis<sup>(4)</sup>.

Adenomyosis is the second most common benign gynecologic disease causing women to undergo surgery in the present study. In one review in 1974, endometriosis was present in 11% of women with adenomyosis<sup>(10)</sup>. In a recent study aimed to study about adenomyosis in hysterectomy specimens, conducted in Nepal, the investigators reported a 75% coexistence of endometriosis and adenomyosis<sup>(7)</sup>. However, the number of endometriosis cases was very small. In one study involving 160 women with endometriosis and using magnetic resonance imaging for diagnosis of adenomyosis, the prevalence of coexistence of both diseases was 79%<sup>(11)</sup>. The rate of coexistence of endometriosis and adenomyosis in the present study was 43.5%. Both diseases can cause progressive dysmenorrhea. However, patients with adenomyosis usually have hypermenorrhea, whereas patients with endometriosis did not. Even though adenomyosis produces dysmenorrhea, two third of coexistence of both diseases can be diagnosed preoperatively. In women with diagnosis of adenomyosis alone, 21.2% had concomitant endometriosis.

In women with benign ovarian cysts, the prevalence of endometriosis was 50%, which is higher

than those in the Italian study (35%)<sup>(3)</sup>. Dermoid cyst is the most common benign ovarian cyst and 30% of them had coexistent endometriosis. Only one fifth of patients were diagnosed with the coexistence of dermoid cyst and endometriosis preoperatively. In 19 patients with preoperative diagnosis of dermoid cyst, five patients were excluded from the study because the diagnosis altered to endometriotic cyst postoperatively. This finding suggested that the ultrasonographic finding of both diseases sometime looked similar. For other benign ovarian cysts, the authors cannot make any comment or conclusion because of the small number of cases.

One of the strengths of the present study is its prospective design and a large number of women in the analysis, which gave statistical power to detect the significantly different findings. Limitation of the present study was that the data were present the overview of benign gynecologic diseases that needed surgical treatment. Further study of each benign condition should be conducted. Moreover, patients in the present study underwent a mixture of laparotomy and laparoscopy, so the prevalence of endometriosis may underestimate.

In light of the findings of the present study, it is advisable to counsel patients with benign gynecologic diseases of the high likelihood that a concurrent diagnosis of endometriosis may be made and they should strongly consider surgical evaluation and treatment for both diseases.

In conclusion, the prevalence of coexistence of endometriosis and benign gynecologic diseases, especially uterine leiomyoma, adenomyosis, and benign ovarian cyst, was high. The diagnosis of concomitant diseases was made intra-operatively and postoperatively in more than half of the cases. Physicians should be concerned about the coexistence of both conditions and put this finding into the preoperative counseling data and they should be informed of the likelihood of definite surgery in advanced stages of endometriosis.

#### **What is already known on this topic?**

Several previous studies reported that 12-86% of uterine leiomyoma or fibroids were concomitant with endometriosis<sup>(3-6)</sup>. There was discrepancy of prevalence of both conditions among studies. Thirty five percent of women with ovarian cysts had the coexistence of endometriosis<sup>(3)</sup>. There have been no report of coexistent endometriosis in other benign gynecologic diseases before.

#### **What this study adds?**

There was no previous study about the prevalence of endometriosis in women undergoing surgery for benign gynecologic disease before. The present study determines the prevalence of endometriosis in Thai women undergoing surgery for other benign gynecologic diseases. The results could help physicians to put this finding into the preoperative counseling data. Women with high risk of concomitant disease should be informed for treatment of both conditions in the same time.

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#### **Potential conflicts of interest**

None.

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## ความชุกของโรคเยื่อบุมดลูกเจริญผิดที่ในผู้ป่วยที่ได้รับการผ่าตัดด้วยโรคหรือเนื้องอกทางนรีเวชที่ไม่ใช่มะเร็ง

ประสงค์ ตันมหาสมุทร, ศิษณุพงศ์ หนูทอง, ณัฐชญา สว่างอารีย์กุล, กิตยาภรณ์ ศิลป์ประสิทธิ์, จงดี แดงรัตน์

**วัตถุประสงค์:** เพื่อหาความชุกของโรคเยื่อบุมดลูกเจริญผิดที่ในสตรีที่เป็นโรคทางนรีเวชที่ไม่ใช่มะเร็ง และหาปัจจัยที่เพิ่มความเสี่ยงของการวินิจฉัยโรคเยื่อบุมดลูกเจริญผิดที่ร่วมกับโรคทางนรีเวชที่ไม่ใช่มะเร็งได้ก่อนการผ่าตัด

**รูปแบบการศึกษา:** การศึกษาเชิงพรรณนา

**กลุ่มตัวอย่าง:** ผู้เข้าร่วมการศึกษาได้แก่ สตรีที่เป็นโรคทางนรีเวชที่ไม่ใช่มะเร็งที่ต้องรักษาด้วยการผ่าตัด ที่ภาควิชาสูติศาสตร์-นรีเวชวิทยา คณะแพทยศาสตร์ศิริราชพยาบาล มหาวิทยาลัยมหิดล จำนวนทั้งหมด 331 ราย

**วัสดุและวิธีการ:** รวบรวมข้อมูลโดยสัมภาษณ์ผู้เข้าร่วมการศึกษาและทบทวนเวชระเบียนเพื่อเก็บข้อมูลพื้นฐาน ประวัติทางการแพทย์ และประวัติทางนรีเวช หลังจากผู้เข้าร่วมการศึกษาได้รับการผ่าตัดแล้ว ผู้นิพนธ์จะทบทวนบันทึกการผ่าตัดและผลการตรวจทางพยาธิวิทยาว่ามีกรณีวินิจฉัยโรคเยื่อบุมดลูกเจริญผิดที่ร่วมด้วยหรือไม่ และนำผลลัพธ์ดังกล่าวมาคำนวณค่าความชุกของโรคเยื่อบุมดลูกเจริญผิดที่ในผู้ป่วยเป็นโรคทางนรีเวชที่ไม่ใช่มะเร็ง และหาปัจจัยที่เพิ่มความเสี่ยงของการวินิจฉัยโรคเยื่อบุมดลูกเจริญผิดที่ร่วมกับโรคทางนรีเวชที่ไม่ใช่มะเร็งได้ก่อนการผ่าตัดต่อไป

**ผลการศึกษา:** จากผู้เข้าร่วมการศึกษาทั้งหมด 331 ราย พบว่าสตรี 101 ราย เป็นโรคเยื่อบุมดลูกเจริญผิดที่ร่วมกับโรคทางนรีเวชที่ไม่ใช่มะเร็ง ความชุกของโรคเยื่อบุมดลูกเจริญผิดที่ในสตรีที่เป็นโรคทางนรีเวชที่ไม่ใช่มะเร็งได้เท่ากับร้อยละ 30.5 และใน 285 รายที่ไม่เคยได้รับการวินิจฉัยว่าเป็นโรคเยื่อบุมดลูกเจริญผิดที่มาก่อน พบว่ามีสตรี 55 ราย พบเป็นโรคเยื่อบุมดลูกเจริญผิดที่ ดังนั้นความชุกของโรคเยื่อบุมดลูกเจริญผิดที่ในสตรีกลุ่มนี้คิดเป็นร้อยละ 19.3 โรคที่พบบ่อยสามอันดับแรกที่ทำให้สตรีต้องเข้ารับการผ่าตัด ได้แก่ เนื้องอกมดลูก อะดีโนมายโอซิส และถุงน้ำรังไข่ที่ไม่ใช่เนื้อร้าย และพบว่าโรคเยื่อบุมดลูกเจริญผิดที่ร่วมด้วยคิดเป็นร้อยละ 28, 43.5 และ 50 ตามลำดับ สตรีที่ได้รับการวินิจฉัยโรคเยื่อบุมดลูกเจริญผิดที่ก่อนผ่าตัดมีอายุน้อยกว่าสตรีที่ได้รับการวินิจฉัยโรคเยื่อบุมดลูกหลังผ่าตัดอย่างมีนัยสำคัญ

**สรุป:** โรคเยื่อบุมดลูกเจริญผิดที่มีความชุกสูงในสตรีที่เป็นโรคทางนรีเวชที่ไม่ใช่มะเร็งโดยเฉพาะอย่างยิ่ง เนื้องอกมดลูก อะดีโนมายโอซิส และถุงน้ำรังไข่ที่ไม่ใช่เนื้อร้าย ทั้งนี้การวินิจฉัยโรคเยื่อบุมดลูกเจริญผิดที่ร่วมกับโรคทางนรีเวชที่ไม่ใช่มะเร็งนั้นพบว่ามีมากกว่าครึ่งหนึ่งวินิจฉัยได้ในขณะและหลังการผ่าตัด ดังนั้นแพทย์ควรให้ความสำคัญและแจ้งสตรีที่จะรักษาด้วยการผ่าตัดได้รับทราบเสมอว่าอาจจะต้องการการผ่าตัดมดลูกและรังไข่ออก ในกรณีที่เป็นโรคเยื่อบุมดลูกเจริญผิดที่รุนแรง