Actinomyces Colonization in IUD Users

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Abstract : **The objective of this study is to assess the incidence of Actinomyces colonization in the Papanicolaou smears of IUD users at the Family Planning Research Center, Siriraj Hospital. IUD users who attended the center from January 1997- April 1997, regardless of how long they have been using the IUDs, were screened for Actinomyces colonization at the time of enrolment. 342 IUD users with a negative Papanicolaou smear for Actinomyces colonization were included in the study and basic characteristics, type and duration of IUD use were recorded. Papanicolaou smears to detect Actinomyces colonization were repeated again 12 months later. Abnormal signs and symptoms were recorded. The main outcome measurement was a positive Papanicolaou smear for Actinomyces colonization. The incidence of Actinomyces colonization was 9.9% in IUD users regardless of type of IUDs (N = 34). Inert IUDs produced a significantly higher colonization rate as compared with metallic IUDs (P<0.05). The colonization rates for Lippes D, Lippes C, ML Cu 250, and Cu T 380 A were 28.6%, 25.0%, 14.1%, and 2.1%, respectively. The colonization rates appeared to increase with the duration of IUD use before the study and 61.7% of them were detected after 48 months of IUD use before the study. Almost all positive smear IUD users (91.2%) were asymptomatic. The incidence of Actinomyces colonization was related to the type and duration of IUD use. For this reason, all patients with IUDs should undergo annual Papanicolaou smears for diagnosis and appropriate treatment including removal of IUDs and oral penicillin which were effective in this study.**

เรื่องย่อ : **แอคติโนไมซีสในผู้รับบริการใส่ห่วงอนามัยคุมกำเนิด**
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ทำการศึกษาเพื่อหาอุบัติการณ์ของโคโลไนเซชันของแอคติโนไมซีสในผู้รับบริการใส่ห่วงอนามัยคุมกำเนิด โดยได้ศึกษาในผู้รับบริการใส่ห่วงอนามัยคุมกำเนิดจำนวน 342 รายที่มารับบริการที่ศูนย์วิจัยวางแผนครอบครัว โรงพยาบาลศิริราช ระหว่างเดือนมกราคมถึงเดือนเมษายน 2540 โดยไม่คำนึงว่าจะใส่ห่วงอนามัยมานาน

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เท่าใดก่อนการศึกษา ผู้ป่วยทุกรายจะได้รับการตรวจปาปานิโคเลาสเมียร์เมื่อเริ่มทำการศึกษาซึ่งจะต้องไม่พบโคโลไนเซชันของแอคติโนไมซีส และจะได้รับการบันทึกข้อมูลทั่วไป ชนิด และระยะเวลาที่ใส่ห่วงอนามัยคุมกำเนิด จากนั้นจะนัดตรวจติดตามเมื่อ 12 เดือนหลังเริ่มการศึกษา โดยจะตรวจปาปานิโคเลาสเมียร์ เพื่อหาโคโลไนเซชันของแอคติโนไมซีสซ้ำ รวมทั้งบันทึกอาการและอาการแสดงที่ผิดปกติ ตัววัดที่สำคัญคือการตรวจพบโคโลไนเซชันของแอคติโนไมซีสจากปาปานิโคเลาสเมียร์ ผลการศึกษาพบว่ามีโคโลไนเซชันของแอคติโนไมซีสในผู้รับบริการใส่ห่วงอนามัยคุมกำเนิด จำนวน 34 ราย คิดเป็นอุบัติการณ์ร้อยละ 9.9 โดยพบในห่วงอนามัยคุมกำเนิดชนิด inert มากกว่าชนิด metallic IUDs อย่างมีนัยสำคัญทางสถิติ ($P<0.05$) สัดส่วนการตรวจพบโคโลไนเซชันของแอคติโนไมซีสในผู้ที่ใช้ห่วงอนามัยคุมกำเนิด ชนิด Lippes D, Lippes C, ML Cu 250 และ Cu T 380A เท่ากับร้อยละ 28.6, 25.0, 14.1 และ 2.1 ตามลำดับ พบว่าอุบัติการณ์ของโคโลไนเซชันของแอคติโนไมซีสเพิ่มขึ้นตามระยะเวลาที่ใส่ห่วงอนามัยคุมกำเนิดมาก่อนเริ่มการศึกษา โดยร้อยละ 61.7 จะตรวจพบเมื่อใส่ห่วงอนามัยคุมกำเนิดมานานกว่า 48 เดือนขึ้นไป ร้อยละ 91.2 ของรายที่มีโคโลไนเซชันของแอคติโนไมซีสไม่มีอาการหรืออาการแสดง เนื่องจากพบว่าอุบัติการณ์ของโคโลไนเซชันของแอคติโนไมซีสมีความสัมพันธ์กับชนิดและระยะเวลาที่ใส่ห่วงอนามัยในการคุมกำเนิด ผู้รับบริการใส่ห่วงอนามัยคุมกำเนิดทุกรายจึงควรได้รับการตรวจปาปานิโคเลาสเมียร์ เพื่อการวินิจฉัยและให้การรักษาตามความเหมาะสม เป็นประจำทุกปี การรักษาที่มีประสิทธิภาพจากการศึกษาในครั้งนี้ได้แก่การถอดห่วงอนามัยออกและให้ยาปฏิชีวนะกลุ่มเพนนิซิลลินชนิดรับประทานแก่ผู้รับบริการ

INTRODUCTION

IUD is a temporary method of contraception which is popular around the world due to its high efficacy and low incidence of side effects.[1] About 6.1-12.9% of Thai women currently use IUDs for contraceptive method of choice.[2] At the WHO Collaboration Center, Siriraj Hospital, IUD users have increased from 13.6% in 1987 to 17.7% in 1997 and this trend will continue in the future. However, pelvic inflammatory disease (PID) which is one of the risks for IUDs user has increased from 6% to 10.9%.[3] The major causative organisms include aerobic and anaerobic bacteria. Actinomyces is found to be the cause in 17-25% of infections.[4]

Actinomyces is a gram positive, non-acid-fast anaerobic bacteria which is normally found in the gastrointestinal tract and is not usually found in the female genital tract.[5-8] This organism does not cause disease unless the genital tract is inflamed. If a chronic foreign body reaction from prolonged usage of IUD has occurred, actinomyces may become a pathogen. The most common pathogen is *Actinomyces israelii* and the less common ones are *Actinomyces naelundii, Actinomyces odontolyticus, Actinomyces viscosus* and *Actinomyces meyen*.[8]

Pelvic actinomyces is believed to occur from oro-genital or ano-genital contact.[9] The signs and symptoms include vaginal discharge, cervicitis, endometritis or PID. The diagnosis of pelvic actinomyces from a Papanicolaou smear depends on cytomorphological identification[10] which includes basophilic, filamentous, branching structures running in parallel. Gupta reported a 98% specificity and 94% sensitivity for this method. Culture of the organism has low sensitivity due to the fact that it is an anaerobic organism.[1,9]

Even though actinomyces is a penicillin-responsive organism, pelvic actinomyces always present with severe clinical symptom and surgery is the final treatment.[1,9] IUD removal and antibiotic treatment is recommended in those patients without any symptoms.[1,9]

MATERIALS AND METHODS

During the period from January 1997 to April 1997 at the Family Planning Research Center, Siriraj Hospital, all the IUD users who attended the center regardless of how long they have been using the IUDs were screened for actinomyces colonization at the time of enrolment. 342 IUD users with a negative Papanicolaou smear for actinomyces colonization were included in the study and basic characteristics, type and duration of IUD use were recorded. Patients with a missing IUD thread, abnormal vaginal bleeding, currently taking antibiotics or new patients were excluded from this study.

A repeat Papanicolaou smear was taken at follow up 12 months later. If the Papanicolaou smear showed actinomyces colonization, the IUD might be removed and 2 grams of oral penicillin per day for 2 weeks was given and follow up again 6 weeks after IUD removal. If the Papanicolaou smears showed persistent colonization, oral penicillin was continued for another 1 month and the smear for actinomyces colonization was done again.

The data was analysed by the SPSS/PC program.

RESULTS

Three hundred and forty-two patients whose basic characteristics shown in Table 1 were included in this study.

Table 1. Basic characteristics of 342 IUD users.

Characteristics	Number (%)
Mean age ± SD (years)	36.6 ± 7.6 (range 19-57)
Gravida	
0	1 (0.3)
1	133 (38.9)
2	144 (42.1)
≥ 3	64 (18.7)
Parity	
0	4 (1.2)
1	171 (50)
2	143 (41.8)
≥ 3	24 (7)
Abortion	
0	256 (74.8)
1	71 (20.8)
2	8 (2.3)
≥ 3	7 (2.1)

Most of the patients wore ML Cu 250 (45.6%) and Cu T 380A (41.8%). The incidence of actino-myces colonization was 9.9% (34/342 cases) and mostly found in inert IUD users (Lippes D 28.6% and Lippes C 25.0%). The details of the rates of actinomyces colonization for each type of IUD are shown in Table 2.

Table 2. Rates of actinomyces colonization for each type of IUD.

Types of IUD	% of users	No. of positive smears/No. of users	Colonization rate (%)
Inert			
Lippes C	1.2	1/4	25.0
Lippes D	8.1	8/28	28.6
Metallic			
Cu Fix	0.9	0/3	0
Cu T 250 A	0.9	0/3	0
Cu T 380 A	41.8	3/143	2.1
ML Cu 250	45.6	22/156	14.1
ML Cu 375	1.2	0/4	0
Nova T	0.3	0/1	0
Total	100	34/342	9.9

The difference between the mean age, number of parities and abortions in IUDs users was not significant. The difference between the duration of IUD use in positive and negative smears was found to be significant as shown in Table 3.

The difference between actinomyces colonization in inert IUD and metallic IUD users was found to be significant as well as the difference between ML Cu 250 and Cu T 380 A users in the metallic IUD users as shown in Table 4.

Actinomyces colonization was found in about 61% of those with prolonged IUD use (>48 months), and all patients who had used a Lippes IUD for $\geq$ 85 months were found to be colonized with actinomyces. The details are shown in Table 5.

Most patients with positive (91.2%) and negative smears (91.6%) had no signs and symptoms. Concerning the symptomatic cases, the patients with negative smears had leukorrhea (76.9%), pelvic pain (15.4%) and abnormal bleeding (7.7%), while those with positive smears had only leukorrhea as shown in Table 6.

Shown in Table 7, of the total of 34 patients who were colonized with actinomyces, 27 cases had actinomyces alone while the other 7 cases were associated with other cytological and microbiological findings (numerous inflammatory cells, fungus and trichomonas).

If actinomyces colonization was found, the IUD was removed. 26 out of 34 cases (76.4%) with positive smears were found to have negative smears after IUDs removal at 6 weeks. The remaining 8 cases (23.6%) continued with oral penicillin for 4 weeks with negative smears after the treatment.

Table 3. Colonization between negative and positive smear users.

Variable	Negative smears (N = 308)	Positive smears (N = 34)	P value
	N (%)	N (%)	
Mean age ± SD (years)	36.5 ± 7.6 (range 19-56)	37.5 ± 7.9 (range 24-57)	0.45*
Mean months of IUD use	64.8 ± 67.9 (range 1-360)	110.4 ± 93.8 (range 24-168)	0.01*
Parity			
0	1 (1.3)	0	0.92**
1	152 (49.3)	19 (56.9)	
2	132 (42.9)	11 (32.3)	
≥ 3	20 (6.5)	4 (11.8)	
Abortion			
0	232 (75.8)	24 (70.6)	0.17**
1	65 (21.1)	6 (17.6)	
2	5 (1.6)	3 (8.8)	
≥ 3	6 (2.0)	1 (2.9)	
Duration of use (months)			
≤ 24	341/342 (99)	1/342 (0.3)	
25-48	329/341 (96)	12/341 (3.5)	
49-72	326/329 (99)	3/329 (1)	
73-84	325/326 (99)	1/326 (0.3)	
≥ 85	308/325 (95)	17/325 (5)	

*Student t-test, **Chi-square test.

Table 4. Rates of actinomyces colonization in inert IUD and metallic IUD users.

Type of IUD	No. of positive smears	Colonization rate (%)	P value
Inert IUD	9/32	28.1	0.0017*
-Lippes C	1/4	25.0	
-Lippes D	8/28	28.6	
Metallic IUD	25/310	8.1	
-ML CU 250	22/156	14.1	0.01**
-Cu T 380A	3/143	2.1	
Total	34/342	9.9	

*Fisher's Exact test, **Chi-square test.

Table 5. Colonization rate by duration of use.

Duration (months)	Colonization rate (%)			
	Lippes IUD	Multiload IUD	Copper T IUD	Total
≤ 24	0	1/22 (4.5)	0	1/34 (2.9)
25 - 48	0	10/22 (45.5)	2/3 (66.7)	12/34 (35.3)
49 - 72	0	3/22 (13.6)	0	3/34 (8.9)
73 - 84	0	0	1/3 (33.3)	1/34 (2.9)
≥ 85	9/9 (100)	8/22 (36.4)	0	17/34 (50)

Table 6. Clinical findings in IUD users with positive and negative smears for actinomyces colonization.

Clinical findings	Number of patients (%)	
	Negative smears (N = 308)	Positive smears (N = 34)
Asymptomatic (N = 313)	282 (91.6)	31 (91.2)
Symptomatic (N = 29)	26 (8.4)	3 (8.8)
1. leukorrhea (± pruritus)	20 (76.9)	3 (100)
2. pelvic pain	4 (15.4)	-
3. abnormal bleeding	2 (7.7)	-
Total	308 (100)	34 (100)

Table 7. Number of patients with actinomyces colonization and other infective agents or abnormal cytological diagnosis.

Agents or abnormal cytological diagnosis	No. of patients (N = 34)	%
Actinomyces alone	27	79.4
Actinomyces with		
Numerous inflammatory cells (acute infection)	4	11.8
Fungal infection	2	5.9
Trichomonas vaginalis	1	2.9

DISCUSSION

The incidence of actinomyces colonization in IUD users was about 7% and less than 1% in non-IUD users.[9] There was no correlation between age, parity, number of abortion and actinomyces colonization which corresponded to previousstudies.[11,12] The incidence of actinomyces colonization was high in inert IUD users especially Lippes D and C, and low in metallic IUDs. This can be explained by the fact that copper in the IUD acts has bacteriostatic action therefore actinomyces can not colonize. The duration of copper IUD usage is limited to 3-5 years which can control actinomyces colonization.[1]

The incidence of actinomyces colonization is higher in patients with prolonged use of an IUD. This can be explained by the fact that actinomyces needs time to colonize[10] and an anaerobic environment from chronic foreign body reaction in the uterine cavity is appropriate for actinomyces.[5,8] Some studies[1,13] have found that the incidence is increased in patients who have had an IUD for at least 48 months and is higher in those who have had an IUD for 8 years. In this study, actinomyces colonization was higher in the patient who wore a metallic IUD for at least 25-48 months. This may have resulted from prolonged use of IUD and a decrease in its bacteriostatic action.

The treatment of actinomyces colonization includes removal of the IUD and oral penicillin.[1,9] In this study, IUD removal and penicillin therapy for 4 weeks were found to be effective and should be applied in general practice. Once actinomyces colonization is identified, correct management of the patients should proceed in order to prevent the complications of pelvic inflammatory disease.

This study confirms the finding of previous studies that most patients with actinomyces colonization had no signs and symptoms of pelvic inflammatory disease.[1,14] It also confirms the belief that actinomyces colonization is not associated with any particular organism.[10]

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