Original Articles/นิพนธ์ต้นฉบับ

Screening of Cervical Cancer by Conventional Papanicolaou Smear and a Liquid-Based Thin-Layer (Thin Prep) Smear

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Abstract

Objectives: To study the rate of cervical cancer screening in women and its results comparing between conventional Papanicolaou smear (Pap smear) method and Thin Prep smear method.

Material and Method: This is a descriptive study that analysis of the women who visited the gynecological out patient department (OPD) clinic of a private hospital in Bangkok,Thailand. The cervical cancer screening was done by conventional Papanicolaou smear (Pap smear) or Thin Prep smear. The rate of screening and results of abnormal findings were reported. Data was collected from gynecological OPD medical records during April to December, 2007.

Results : The results showed that among 5,943 women who came to a gynecological OPD clinic, 59.7%, (95% CI = 58.4, 60.9) were screened for cervical cancer, abnormalities were found in 31 women, 0.87%, (95%CI = 0.57, 1.18). The cervical cancer screening by Thin Prep found 5.8 times more abnormalities than by Pap smear ($p < 0.05$). Abnormalities were found by Thin Prep in 26 cases (1.56%) compared to 5 cases (0.27%) by Pap smear. Eighty percent of abnormal Pap smear results correlated with pathological diagnoses (4 out of 5 cases) compared to 77% (17 out of 22 cases) of Thin Prep. Significant factors associated with cervical cancer screening were age, occupation, marital status, number of living children and residence. Significant factors associated with the screening method were age, occupation, marital status and number of living children ($p < 0.05$).

Conclusion: The rate of cervical cancer screening in private hospitals was still less than expected. The Thin Prep smear method found more abnormal cervical cells than the Pap smear method but with comparable accuracy. This study could be useful in order to encourage a more appropriate screening method for women.

Keywords: Screening, Cervical cancer, Conventional Papanicolaou smear, Thin prep

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Introduction

Cervical cancer is the third most common cancer in the world and the leading cause of cancer death among women in developing countries[1]. Worldwide, an estimated 470,000 new cases occur and 233,000 women die annually from cervical cancer[2,3]. Eighty percent of these deaths occur where resources are the most limited[4]. In developed countries it is the fifth most common cancer in all women under the age of 50 years. World standardized, age-adjusted incidence rates range from 5 to 42 per 100,000[5]. Where organized comprehensive detection, treatment, and referral program have been implemented, the incidence and mortality of the cancer has decreased dramatically[6]. The decline in death rates from cervical cancer has been widely attributed to Pap test for screening of cervic for early detection of cervical cancer. So that Pap test must have good sensitivity and specificity for cervical screening compare to cost and benefit of diagnosis and treatment. Women must be intensively educated that cervical screening should be scheduled routinely to detect asymptomatic cervical cancer. In Thailand the cervical screening have been estimate at 20% to 30% in the women age over 35 years. Expectation the year 2008 will have new case of cervical cancer about 8,000 case. The rate of cervical cancer will be reduced at 61% and 50% for five years if 80% of woman aged over 35 are screened.

The objective of this study was studied the rate of cervical cancer screening in the woman who visited gynecological OPD clinic of a private hospital in Bangkok, the association factors of the cervical cancer screening and screening method. The results of cervical cancer screening by conventional Papano-colaou smear and Thin prep method.

Material and Method

Descriptive research, retrospective study that analysis of the women who came to the gynecological OPD clinic for diagnosis and treatments at Synphaet Hospital, Bangkok and were screened cervical cancer by Pap test (Conventional and Thin Prep). Data were collected form record books and medical record in during April to December, 2007. Statistical analysis was performed using percentage, mean, standard deviation to describe the rate and details of cervical cancer screening. Chi-square test and Z-test were used for the analysis of associated factors and different of screening methods. The data processing was carried out on SPSS program for Window version 16.0.

Results

The results showed that among 5,943 women who came to gynecological OPD clinic, 3,545 women (59.7%, 95% CI = 58.4, 60.9) were screened for cervical cancer, 1,879 cases (53.0%) by Pap smear and 1,666 cases (47.0%) by the Thin Prep method.

The table 1 showed that 5,943 women who visited the gynecological OPD clinic, 3,545 women were screened cervical cancer. There were statistical significant differences in age, occupation, marital status, number of living children and residence. The mean age of women who visited were 37.5±9.8 years old. Young women age <20 years old had no cervical cancer screening (65.7%).

Occupation: About 80% of employees were screened cervical cancer compared to 57% of student.

Marital status: Most of the married women (85.1%) were screened cervical cancer compared to 59.1% of. single women.

Residence: Most of women stayed around hospital and suboutside area of hospital.

Number of living children: Ninety one percent of women who had 4 living children or more were screened cervical cancer compared to 64.2% of women who had no children.

The table 2 showed that 3,545 women were screened cervical cancer by Pap smear 1,879 women

Table 1. Factors associated with cervical cancer screening

Factors	Screening			x^2	df	p-value
	Yes (n=3,545) No.(%)	No (n=868) No.(%)	Total (n=4,413) No. (%)			
Age (Years)						
<20	13(32.5)	27(65.7)	40(0.9)			
20-29	578(66.0)	298(34.0)	876(19.8)			
30-39	1,562(82.3)	336(17.7)	1,898(43.0)			
40-49	988(86.7)	152(13.3)	1,140(25.8)			
50-59	276(86.2)	44(13.8)	320(7.2)			
≥60	128(92.1)	11(7.9)	139(3.1)	2.249	5	< 0.001
Mean±SD	35.7±9.8	Min= 16	Max=85			
Occupation						
Student	53(57.0)	40(43.0)	93(2.1)			
Housewife	394(88.1)	53(11.9)	447(10.1)			
Employee	2,489(79.6)	637(20.4)	3,126(70.8)			
Government/State	135(73.4)	49(26.6)	184(4.2)			
enterprise officer	474(84.2)	89(15.8)	563(12.8)	61.282	4	< 0.001
Merchant						
Marital status						
Single	474(59.1)	328(40.9)	802(18.2)			
Married	2,977(85.1)	523(14.9)	3,500(79.3)			
Widow/Divorce/Separate	94(84.7)	17(15.3)	111(2.5)	2.796	2	< 0.001
Number of living children						
None						
1-3	1,055(64.2)	588(35.8)	1,643(37.2)			
≥4	2,65(89.8)	268(10.2)	2,633(59.7)			
Religion	125(91.2)	12(8.8)	137(3.1)	4.306	2	< 0.001
Buddhism	3,366(80.6)	811(19.4)	4,177(94.7)			
Islam	120(76.4)	37(23.6)	157(18.1)			
Christianity	59(74.7)	20(25.3)	79(1.8)	3.274	2	0.195
Residence						
Around hospital	3,002(81.4)	687(18.6)	3,689(83.6)			
Suboutside area of hospital	338(75.8)	108(24.2)	446(10.1)			
Other provinces	205(73.7)	73(26.3)	278(6.3)	16.030	2	< 0.001
History of STD						
Ever	103(76.3)	32(23.7)	135 (3.06)			
No ever	3,442(81.7)	836(18.3)	4,278(96.94)	1.435	1	0.231

Table 2. Factors associated with cervical cancer screening by Pap smear and Thin Prep method

Factors	Pap smear (n=1,879) No. (%)	Thin Prep (n=1,666) No. (%)	Total (n=3,545) No. (%)	x^2	df	p-value
Age (Years)						
16-29	340(57.5)	251(42.5)	591(16.6)			
30-39	829(53.1)	733(46.9)	1,562(44.1)			
40-49	483(48.8)	505(51.2)	988(27.9)			
50-59	155(56.2)	121(43.8)	276(7.8)			
≥60	72(56.2)	56(43.8)	128(3.6)	13.231	4	< 0.01
Mean±SD	37.5±9.8	Min=16	Max=85			
Occupation						
Student	38(71.7)	15(28.3)	53(1.5)			
Housewife	206(52.3)	188(47.7)	394(11.1)			
Employee	1,635(52.8)	1,463(47.2)	3,098(87.4)	7.582	2	0.023
Marital status						
Single	283(59.7)	191(40.3)	474(13.4)			
Married	1,546(51.9)	1,431(48.1)	2,977(83.9)			
Widow/Divorce/Separate	50(53.2)	44(46.8)	94(2.6)	9.920	2	0.007
Religion						
Buddhism	1,775(52.7)	1,591(47.3)	3,366(94.9)			
Islam	74(61.7)	46(38.3)	120(3.4)			
Christianity	30(50.8)	29(49.2)	59(1.7)	3.824	2	0.148
Residence						
Around hospital	1,592(53.0)	1,410(47.0)	3,002(84.7)			
Suboutside area of hospital	181(53.6)	157(46.4)	338(9.5)			
Other provinces	106(51.7)	99(48.3)	205(5.8)	0.180	2	0.914
Number of living children						
None	621(58.9)	434(41.1)	1,055(29.8)			
1-3	1,200(50.7)	1,165(49.3)	2,365(66.7)			
≥4	58(46.4)	67(53.6)	125(3.5)	21.592	2	< 0.001
History of STD						
Ever	57(55.3)	46(44.7)	103(2.9)			
No ever	1,822(52.9)	1,620(47.1)	34 42(97.1)	0.232	1	0.63

and Thin prep method 1,666 women.There were statistical significant differences in age, occupation, marital status and number of living children. The largest groups (44.1%) were between 30 to 39 years old. The old aged women more screened cervical cancer by Thin prep method.

Occupation: About 53% of employees were screened by Pap smear compared to 71.7% of students.

Marital status: About 60 % of single women were screened cervical cancer by Pap smear compared to 51.9% of married women.

Number of living children: About 46% of women who had 4 living children or more were screened cervical cancer by Pap smear compared to 58.9% of women who had no children.

The results showed that among 3,545 women who were screened for cervical cancer, 1,879 cases (53.0%) by Pap smear and 1,666 cases (47.0%) by the Thin Prep method. Abnormalities were found in 31 women, 0.87%, (95% CI = 0.57, 1.18). The cervical

Table 3. Result of cervical cancer screening by Papanicolaou smear (Pap smear) and a liquid- based thin-layer (Thin Prep) smear

Result screening	Pap smear No.(%)	Thin Prep No.(%)	Total No.(%)
Total screening	1,879 (53.0)	1,666 (47.0)	3,545 (100.0)
Normal	1,874 (53.4)	1,640 (46.6)	3,514 (99.13)
Abnormal	5 (0.27)	26 (1.56)	31(0.87)

Table 4. Relationship between colposcope biopsy for pathological diagnosis of screening and abnormal Pap smear

Result of Pap smear	Result of colposcope diagnosis						
	ASCUS	LSIL	CINI	CINII	CINIII	CIS	Invasive cancer
ASCUS					0		
LSIL							
CINI							
CINII							
CINIII							
CIS					00		0 0
Invasive cancer							

cancer screening by Thin Prep more found abnormalities 5.8 times than Pap smear. Abnormalities were found by Thin Prep in 26 cases (1.56%) compared to 5cases (0.27%) by Pap smear. There was statistically significant differed between the two groups ($p<0.05$).

Table 4 showed eighty percent of abnormal Pap smear results correlated with colposcope biopsy pathological results (4 out of 5 cases). One case was not correlated and under diagnosis.

Table 5 showed seventy seven percent (17 out of 22 cases) of abnormal Thin Prep results were correlated with to pathological diagnosis by colposcope biopsy and five case were not correlated. Four out of twenty two were under diagnosis and one out of twenty two was over diagnosis.

Discussion

Among 5,943 women who came to gynecological OPD clinic during April to December 2007. 3,543 women (59.7%) received screening for cervical cancer either by conventional Pap smear or Thin prep. By estimation of 95% confidence interval, the rate of screening was between 58.4% to 60.9%. The rate of screening of cervical cancer was less than expectation in private hospital.This is in contradict with the quality standard for cervical screening, woman aged 20 - 64 years should be screening at least once every 5 years coverage > 80%.[14] The result of this study in accordance with the study of Sriamporn S, Khuhaprema T, Parkin M.[15] who studied cervical cancer screening in Thailand and found that in most part of Thailand, screening had been unsystematic and provide to woman on demand. Coverage of cervical screening

Table 5. Relationship between colposcope biopsy for pathological diagnosis of screening and abnormal Thin Prep

Result of Thin smear	**Result of colposcope diagnosis**						
	ASCUS	LSIL	CINI	CINII	CINIII	CIS	Invasive cancer
ASCUS	0		0 0 0				
LSIL			0 0 0				
CINI		0	0 00 0				
CINII							
CINIII			0	0			0
CIS					0 0	0	0 0 0
Invasive cancer							0

Note : - Four cases were not included
- One case refused for further diagnosis for one case (CIN I)
- Three loss to follow up (LSIL2 cases, CINI 1 case)

remain low at 20% to 30%.[16]

Significant factors were found to be associated with cervical cancer screening were age, occupation, marital status, number of living children and residence. Older women with 4 or more living children and were housewife or worked as employer trended to have more screened than women of other group. There may be due to socioeconomic situation. Older women with high parity had more knowledge about cervical cancer screening than younger women.

Significant factors associated with screening methods were age, marital status and number of living children. Older married women with high parity had more screening method of Thin prep. There may be due to socioeconomic situation and doctor's recommendation.

Among 3,545 women who were screened for cervical cancer, 1,879 cases (53.0%) by Pap smear and 1,666 cases (47.0%) by the Thin Prep method. Abnormalities were found in 31 women. The cervical cancer screening by Thin Prep more found abnormalities 5.8 times than Pap smear. Abnormalities were found by Thin Prep in 26 cases (1.56%) compared to 5 cases (0.27%) by Pap smear. Eighty percent of abnormal Pap smear results were correlated with colposcope pathological results (4 out of 5 cases). Seventy seven percent (17 out of 22 cases) of abnormal Thin Prep results were correlated to The pathological diagnosis by colposcope biopsy. There was statistically significant difference between two methods. Thin prep method significant higher positive detection rate of cervical abnormalities than conventional Pap smears ($p < 0.005$).

In conclusion, rate of cervical cancer screening in private hospital was still less than expectation. Screening of cervical cancer depended on social factor, financing cervical cells than Pap smear but with comparable accuracy. This study was useful in order to encourage and choose the screening method for woman more appropriately.

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Original Articles/นิพนธ์ต้นฉบับ

การตรวจคัดกรองมะเร็งปากมดลูกด้วยวิธีการทดสอบแพ็ปสามัญ และแพ็ปแผ่นบาง

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บทคัดย่อ

ปัจจุบันมีวิธีการตรวจคัดกรองมะเร็งปากมดลูกได้หลายวิธี การศึกษานี้มีวัตถุประสงค์เพื่อศึกษาอัตราการตรวจคัดกรองมะเร็งปากมดลูกในสตรีที่มาตรวจทางนรีเวชในโรงพยาบาลเอกชน ผลการตรวจพบเซลล์ผิดปกติ ด้วยวิธี Pap smear และThin Prep ปัจจัยความสัมพันธ์ ต่อการตรวจ การศึกษาครั้งนี้เป็นการศึกษาเชิงพรรณนา เก็บข้อมูลโดยใช้แบบบันทึกข้อมูลการตรวจมะเร็งปากมดลูก ระหว่างเดือน เมษายน-ธันวาคม ปี พ.ศ. 2550 วิเคราะห์ข้อมูลด้วยสถิติพรรณนา ได้แก่ จำนวน อัตรา ร้อยละ ค่าเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน และใช้สถิติ Chi-square test, Z-Test ทดสอบความมีนัยสำคัญทางสถิติที่ $p < 0.05$

การศึกษาพบว่า สตรีที่มาตรวจ จำนวน 5,943 รายได้รับการตรวจคัดกรองมะเร็งปากมดลูกในอัตราร้อยละ 59.7 (3,545 ราย) พบเซลล์ผิดปกติโดยวิธี Thin Prep ร้อยละ 1.56 และวิธี Pap smear ร้อยละ 0.27 ผลการตรวจด้วยวิธี Pap smear สอดคล้องกับผลการตรวจชิ้นเนื้อทางพยาธิ ร้อยละ 80 วิธี Thin Prep สอดคล้องร้อยละ 77.3 การตรวจด้วยวิธี Thin prep พบเซลล์ผิดปกติมากกว่าวิธี Pap smear 5.8 เท่า ($p < 0.05$) ตัวแปรด้านอายุ อาชีพ สถานภาพสมรส จำนวนบุตร เขตที่อยู่ มีความสัมพันธ์ต่อการตรวจคัดกรองมะเร็งปากมดลูก ตัวแปรด้านอายุ อาชีพ สถานภาพสมรส และจำนวนบุตรมีความสัมพันธ์ต่อวิธีการตรวจ ($p < 0.05$)

โดยสรุป สตรีที่มาตรวจทางนรีเวชในโรงพยาบาลเอกชนยังได้รับการตรวจคัดกรองมะเร็งปากมดลูกในอัตราที่น้อยกว่าที่ควรจะเป็น การตรวจด้วยวิธี Thin Prep มีโอกาสตรวจพบเซลล์ผิดปกติมากกว่าวิธี Papsmear