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Comparing spatula alone and spatula/cotton swab sampling for cervical cytology.

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Tanawattanacharoen S, Wannakrairot P, Tantayaporn K. Comparing spatula alone and spatula/cotton swab sampling for cervical cytology. *Chula Med J* 1996 Jan; 40(1): 33-40

Objective : *The purpose of this study was to compare two cervical sampling methods in cervical cytology.*

Study design : *From December 1,1992 to May 31,1993,288 smears by spatula alone and 278 smears prepared by spatula/cotton swab were performed by random allocation in the Family Planning Clinic of Chulalongkorn Hospital. The main outcome measurement was the effectiveness in obtaining adequate Papanicolaou smear as defined by the presence of endocervical cells and/or metaplastic cells. Statistical analysis was by the Chi-square test.*

Results : *The sampling methods had similar abilities in obtaining an adequate Papanicolaou smear (spatula alone 94.44%, spatula/cotton swab 97.12% ; $P > 0.05$) and correlated well with cytologic diagnosis. No complications were associated with either technique.*

Conclusion : *The spatula alone and spatula/cotton swab are both effective sampling methods for cervical cytology, and the difference in each method's ability to obtain an adequate Papanicolaou smear did not reach statistical significance ($P > 0.05$).*

Key words : *Papanicolaou smear, Cervical cytology.*

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สมชาย ธนวัฒนาเจริญ, พงษ์ศักดิ์ วรธนไกรโรจน์, กิจประมุข ดันตยาภรณ์. การเปรียบเทียบคุณภาพในการตรวจเซลล์วิทยาของปากมดลูกโดยใช้ไม้ปาดอย่างเดียว และใช้ไม้ปาดร่วมกับไม้พันสำลี. จุฬาลงกรณ์เวชสาร 2539 มกราคม; 40(1): 33-40

วัตถุประสงค์ : เพื่อศึกษาเปรียบเทียบคุณภาพในการตรวจเซลล์วิทยาของปากมดลูก โดยใช้ไม้ปาดอย่างเดียว และใช้ไม้ปาดร่วมกับไม้พันสำลี

การออกแบบการศึกษา : ผู้วิจัยได้ทำการศึกษาตรวจเซลล์วิทยาของปากมดลูกในสตรีที่มารับบริการวางแผนครอบครัวที่หน่วยวางแผนครอบครัว โรงพยาบาล-จุฬาลงกรณ์ ระหว่างวันที่ 1 ธันวาคม 2535 ถึงวันที่ 31 พฤษภาคม 2536 โดยแยกเป็น 2 กลุ่ม (โดยวิธี Random allocation) กลุ่มที่ 1 ทำการตรวจโดยใช้ไม้ปาดอย่างเดียว มีจำนวน 288 ราย และกลุ่มที่ 2 ทำการตรวจโดยใช้ไม้ปาดร่วมกับไม้พันสำลี มีจำนวน 278 ราย โดยเกณฑ์ที่ใช้วัดคุณภาพคือการตรวจพบ Endocervical cell และ/หรือ Metaplastic cell ข้อมูลที่ได้นำมาเปรียบเทียบเชิงคุณภาพโดยใช้วิธีทางสถิติ Chi-square test

ผลการศึกษา : การตรวจพบ Endocervical cell ในการตรวจเซลล์วิทยาของปากมดลูกทั้ง 2 วิธี ได้ผลไม่แตกต่างกัน (ใช้ไม้ปาดอย่างเดียว 94.44%, ใช้ไม้ปาดร่วมกับไม้พันสำลี 97.12% : $P > 0.05$) นอกจากนี้ผลการตรวจเป็น Papanicolaou classification (1-5) ก็ไม่แตกต่างกัน ไม่พบว่ามีข้อแทรกซ้อนใดๆ จากการตรวจเซลล์วิทยาของปากมดลูกในการศึกษานี้

สรุปผลการศึกษา : การตรวจเซลล์วิทยาของปากมดลูกโดยใช้ไม้ปาดอย่างเดียว และใช้ไม้ปาดร่วมกับไม้พันสำลีเป็นวิธีการตรวจคัดกรองมะเร็งปากมดลูกระยะแรกเริ่มที่มีประสิทธิภาพ พบว่าไม่มีความแตกต่างอย่างมีนัยสำคัญทางสถิติในการศึกษาเปรียบเทียบคุณภาพในการตรวจเซลล์วิทยาของปากมดลูกโดยวิธีทั้งสอง

Carcinoma of the cervix is the most common genital cancer among Thai women. While the Papanicolaou smear, which has been used for cervical cytologic screening since 1943,⁽¹⁾ is widely regarded as a reliable and inexpensive method for screening for carcinoma of the cervix, the incidence of carcinoma of the cervix has decreased. The reliability of this method depends on proper sampling of the transformation zone (squamocolumnar junction).^(2,3) One can be certain that the entire transformation zone has been adequately sampled only if endocervical cells are present in the smear.^(1,2,4,5)

There are several factors affecting the yield of endocervical cells, including the sample taker, the method and/or instrument used for taking the sample and the cytologic interpretation. A varieties of sample collection techniques have been introduced^(6,7) in attempts to increase the percentage of adequate smears. Many sampling instruments have been developed which have been reported to lead to a considerable increase in the number of smears containing endocervical cells.⁽⁸⁻¹⁵⁾

In Thailand, the Ministry of Health has extended the cervical cytologic screening program to the entire country, but there are two major problems. These are the lack of general practitioners and the expense of the method used. Regarding the first problem, paramedical personnels were historically trained to obtain the smears by using the spatula alone, How-

ever, many inadequate smears were reported. To help solving both problems, simple, inexpensive and practical methods and/or instruments are needed. So, while other developed countries continue developing more advanced instruments, this study reports on the comparative use of the spatula alone and the spatula/cotton swab for the preparation of cervical smears.

Materials and Methods

Subjects

From December 1, 1992 to May 31, 1993, cervical samples were collected from 566 premenopausal women who attended Family Planning Clinic at Chalalongkorn Hospital. The study group was limited to nonpregnant women without prior cervical radiation or surgery. The women who had pathologic leukorrhea or pelvic inflammatory disease were excluded from the study. The age, parity, last menstrual period, method of contraception and current medications being used on each subject were recorded.

Sample Takers

The smears were collected by first year residents of the Department of Obstetrics and Gynecology who were trained to prepare the smears by using the same technique. The cervix always had to be visualized clearly by the sample taker at the time of sampling.

Sampling Methods

The sampling methods were shown in Table 1.

Table 1. The sampling methods.

Group	1	2
Instrument(s) used	Spatula alone	Cotton swab + Spatula
Sampling technique	Rotate 360° on ectocervix	Moisten cotton swab with normal saline solution before use; rotate cotton swab 360° in endocervical canal, then rotate spatula 360° on ectocervix
Smear preparation	Spread material from both sides of the spatula on the glass slide; fix in 95% Ethyl alcohol	Unroll cotton swab material on one half of the glass slide; spread spatula material on the other half and fix in 95% Ethyl alcohol

All samples were interpreted by two cytologic technicians and reviewed by one cytopathologist as a quality-control procedure. All smears were microscopically evaluated for: (1) the presence of endocervical cells [EC + smear], (2) the presence of abnormal or metaplastic cells and (3) Papanicolaou classification[1-5].*

Statistical Analysis

The results were expressed as mean \pm standard deviations. Tests of significance between groups of data were carried out using the unpaired t-test. The relationship between the sampling methods and the cytologic findings was analyzed. Statistical analysis of the results utilized the Chi-square test. A P-value of less than 0.05 was considered statistically significant.

Results

Of a total of 566 smears, 288 smears used the spatula alone and 278 smears were obtained by spatula/cotton swab. There was no statistically significant difference in terms of age and parity among the subjects in both groups (Group 1: age 26.05 ± 5.85 years [15-45], Para 1.39 ± 0.65 and Group 2; age 25.02 ± 4.04 years [15-43], Para 1.48 ± 0.87 respectively).

Table 2. Shows the presence of endocervical cells from each sampling method. Group 2 had a slightly lower percentage of EC-smears, however, the difference was not statistically significant.

*currently used in Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University.

Table 2. The presence of endocervical cells.

Endocervical cells	Group 1		Group 2	
	No. of cases	%	No. of cases	%
EC+smear	272	94.44	270	97.12
EC-smear*	16	5.56	8	2.88

*also absence of abnormal or metaplastic cell.

The cytologic findings are given in Table 3 as Papanicolaou classification. None of the 566 evaluated cases showed invasive carcinoma. One case in each group had an unsatisfactory Papanicolaou classification. There were 19 cases

in group 1 (6.60%) and 27 cases in group 2 (9.71%) who had an abnormal Papanicolaou classification in which all were classified as class 2. This difference did not reach statistical significance as well.

Table 3. Papanicolaou classification.

Pap.classification	Group 1		Group 2	
	No. of cases	%	No. of cases	%
0*	1	0.35	1	0.36
1	268**	93.05	250***	89.93
2	19	6.60	27****	9.71
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0

* Unsatisfactory smear

** Trichomonas 4 cases and Monilia 1 case

*** Trichomonas 6 cases

**** Atrophic change 1 case

Among EC-smears, there were no statistically significant differences in terms of age, parity and Papanicolaou classification (all were classified as class 1).

Discussion

Most investigators agree that the presence of endocervical cells is important for a cervical smear to be considered adequate.^(1,2) Only a

few studies observed no difference in the rates of atypia between women with and without endocervical cells on serial Papanicolaou smears.^(6,16) In our study, all smears without endocervical cells were in class 1 of the Papanicolaou classification as there was no atypia.

As we know several factors such as evidence of inflammation, menstrual bleeding prior douching and pregnancy ,reportedly affect the yield of endocervical cells.⁽¹⁷⁾ Our study included only those cases with theoretically optimal conditions for having a cervical smear taken. No patients who were pregnant, who had a history of cervical radiation or surgery, or who were reported to have pathologic leukorrhea or pelvic inflammatory disease were accepted for the study. The sample takers who performed all samplings were well-trained. Since adequate visualization of the cervix was required during the cervical sampling, only cases in which the cervix was seen were evaluated.

Both sampling methods had similar abilities to obtain adequate Papanicolaou smears and similar rates of correlation with cytologic diagnosis. These findings were not in agreement with some previously reported comparisons of both methods.^(3,18)

This may be due to the instruction to moisten the cotton swab with normal saline solution before use (Table 1) as this sounds more simple than it really is. When the cotton swab is too wet, the cells in the smear acquire an "exploded" appearance. When it is too dry, the cells are mechanically damaged by the friction between the dry cotton swab and the glass slide during the smear preparation (the mucous

is absorbed into the dry cotton), resulting in poor nuclear images in the smear.^(8,18)

The location of the squamocolumnar junction (transformation zone) varies with the patient's age as it shifts with increasing age.⁽¹⁹⁾

After menopause, with reduction in the size of the cervix, the glandular epithelium retracts into the endocervical canal. This is considered to be one of the factors influencing the presence of endocervical cell in cervical smears. The incidence of "inadequate" smears lacking endocervical cells is reported to be 36% to 48% in postmenopausal women, but only 8% to 22% in premenopausal women.^(20,21) To avoid problems due to atrophic changes in postmenopausal women, the women selected for this study were all of premenopausal age. This may be one of the reasons why there is no difference in obtaining adequate smears between the two cervical sampling methods.

The other possibility was that the sample size was too small because we used the different percentage of adequate smear between both sampling methods from the study of Bontinx et al, which were 84% and 93%, respectively.⁽³⁾ By using the results from this study, at least 1,003 smears in each group are needed.

This study presented data on a highly homogenous group of sample takers, each with adequate experience. This was reflected in the relatively high score of EC+smears. Further study using less experienced sample takers, such as medical students, should be performed in order to represent the inexperienced paramedical personnels who were trained to collect the samples.

Based on the results of this study, we concluded that the spatula alone and spatula/cotton swab were both effective sampling methods for cervical cytologic screening by experienced sample takers.

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