

Frottis de Papanicolaou

Avec ou sans écouvillon

Narpinder Hans MD CCFP Andrew J. Cave MB MCISc CCFP FRCGP Olga Szafran MHSA Gordon Johnson MD FRCPC
Ann Glass RN G. Richard Spooner MD CCFP FCFP Philip J. Klemka MD CCFP Shirley Schipper MD CCFP

RÉSUMÉ

OBJECTIF Déterminer si le fait de nettoyer le col de l'utérus avec un écouvillon affecte la qualité du test conventionnel de Papanicolaou.

CONCEPTION Une étude cas-témoins randomisée prospective à simple insu.

CONTEXTE Deux unités d'enseignement universitaire en médecine familiale et 1 cabinet de pratique familiale dans la communauté.

PARTICIPANTES Des patientes de 18 à 65 ans qui se sont présentées pour un test de Pap routinier dans un milieu de pratique familiale ont été choisies au hasard pour faire partie du groupe avec écouvillon (n=300) ou de celui sans écouvillon (n=316).

INTERVENTION Avant le frottis de Pap, le col de l'utérus des patientes du groupe avec écouvillon était essuyé avec un coton-tige pour enlever le mucus visible. Dans le groupe sans écouvillon, le col n'était pas nettoyé avec un coton-tige avant le frottis de Pap.

PRINCIPALES MESURES DES RÉSULTATS La qualité du frottis de Pap conventionnel était déterminée par la présence ou l'absence de cellules endocervicales dans le rapport du pathologiste.

RÉSULTATS Il n'y avait pas de différences majeures entre le groupe avec écouvillon et celui sans écouvillon dans la qualité du frottis de Pap en ce qui avait trait au nombre suffisant de cellules endocervicales.

CONCLUSION Le nettoyage du col de l'utérus avec un coton-tige ne semble pas affecter la qualité du frottis de Pap conventionnel en ce qui a trait au nombre suffisant de cellules endocervicales. La pratique d'essuyer ou non le mucus du col avant le frottis de Pap est donc laissée à la discrétion du clinicien.

POINTS DE REPÈRE DU RÉDACTEUR

- Lors d'un frottis de Papanicolaou conventionnel, les médecins sont souvent en présence de mucus sur le col de l'utérus. Certains croient que le mucus contient des cellules utiles dans le diagnostic, tandis que d'autres sont d'avis que le mucus brouille la composante cellulaire sur la lame.
- Dans cette étude randomisée, on a constaté qu'avec ou sans écouvillon, la qualité du frottis de Pap conventionnel était la même.
- Les auteurs avertissent les lecteurs que leur étude comporte certaines limites, notamment l'hétérogénéité de la technique du frottis de Pap, étant donné le grand nombre de médecins qui ont participé à l'étude. Ils recommandent que cette étude soit refaite dans un plus grand centre, auprès d'un plus important échantillonnage.

Cet article a fait l'objet d'une révision par des pairs.
Le texte intégral est accessible en anglais à www.cfpc.ca/cfp
Can Fam Physician 2007;53:1328-1329

Papanicolaou smears

To swab or not to swab

Narpinder Hans MD CCFP Andrew J. Cave MB MCISc CCFP FRCGP Olga Szafran MHSA Gordon Johnson MD FRCPC
Ann Glass RN G. Richard Spooner MD CCFP FCFP Philip J. Klemka MD CCFP Shirley Schipper MD CCFP

ABSTRACT

OBJECTIVE To determine whether cleaning the cervix with a cotton swab affects the quality of the conventional Papanicolaou smear.

DESIGN Prospective, single-blinded randomized case-control study.

SETTING Two academic family medicine teaching units and 1 community family practice site.

PARTICIPANTS Female patients, 18 to 65 years of age, who presented for a routine Pap smear in the family practice setting were randomized into the Swab Group (n=300) or the No Swab Group (n=316).

INTERVENTION Before the Pap smear, the cervix of patients in the Swab Group was wiped with a cotton swab until visibly free of mucus. In the No Swab Group, the cervix was not cleaned with a cotton swab before the Pap smear.

MAIN OUTCOME MEASURES The quality of the conventional Pap smear was determined by the presence or absence of endocervical cells noted on the pathology report.

RESULTS There was no major difference in the quality of the Pap smear in terms of the adequacy of endocervical cells between the Swab and No Swab Group.

CONCLUSION Cleaning the cervix with a cotton swab does not appear to affect the quality of the conventional Pap smear in terms of adequacy of endocervical cells. This implies that the practice of wiping or not wiping the mucus from the cervix before taking the Pap smear can be employed at the discretion of the clinician.

EDITOR'S KEY POINTS

- When performing conventional Papanicolaou smears, physicians frequently encounter mucus overlying the cervix. Some believe that the mucus contains valuable diagnostic cells, while others believe that the mucus will obscure the cellular component on the slide.
- This randomized study found that swabbing or not swabbing made no difference in the quality of the conventional Pap smear.
- The authors caution that there are some limitations to their study, which include possible heterogeneity in Pap smear technique by the numerous physicians who participated in the study. They recommend that the study be repeated in another centre with a larger sample size.

This article has been peer reviewed.
Full text available in English at www.cfpc.ca/cfp
Can Fam Physician 2007;53:1328-1329.

The purpose of the Papanicolaou smear is to obtain cell samples from the endocervical-squamous cell junction of the cervix (ie, the area in which cervical cancer most frequently develops). During the routine performance of Pap smears, physicians often note the presence of mucus on the cervix. The effect of removing this mucus before sampling the cervical epithelium is debated. Some clinicians believe that the mucus contains a valuable proportion of the diagnostic cells that are being sampled.¹ However, sampling large quantities of thick mucus onto the slide can make it difficult for the screening technician to identify the cellular component. Evidence that wiping the mucus from the cervix removes diagnostic cells and produces an inadequate sample is lacking.

Inadequate tests can result in false-negative conclusions or, if the test is repeated, cause patients anxiety, inconvenience, and resource overexpenditure. Many Pap tests are not repeated promptly, putting patients at risk of delayed diagnosis.² In a primary care setting in British Columbia (BC), Kotaska and Maticic³ investigated the adequacy of samples after swabbing of the cervix. Using the patient's last test as a historical control and also comparing the results with the BC statistical averages, they found a lower frequency of smears with inadequate endocervical cells in women who had the cervix cleaned with a cotton swab before the Pap smear was taken. The authors called for a prospective, randomized controlled trial to be conducted. Researchers from Wisconsin performed an analysis of adequacy using a "broom" (as is used in colonoscopy) and alternative specimen preservation techniques, dry slide or liquid immersion,¹ but did not relate their results to swabbing. Addition of the cytology brush as a routine augment to the spatula has been shown to result in a 30% decrease in the number of "inadequate" samples.⁴

No prospective, randomized controlled trial of cleaning of cervical mucus has been reported in the literature.

Dr Hans is a family physician at the Meadowbrook Medical Clinic and is Associate Clinical Professor in the Department of Family Medicine at the University of Alberta in Edmonton. **Dr Cave** is a Professor in the Department of Family Medicine at the University of Alberta in Edmonton. **Ms Szafran** is the Research Coordinator in the Department of Family Medicine at the University of Alberta. **Dr Johnson** is the Director of Cytopathology at Dynacare Kasper Medical Laboratories in Edmonton. **Ms Glass** is the Manager of the Family Medicine Clinic at the University of Alberta Hospital in Edmonton. **Dr Spooner** is a Professor and the Chair in the Department of Family Medicine at the University of Alberta. At the time of the study, **Dr Klemka** was Assistant Professor in the Department of Family Medicine at the University of Alberta. He is now a family physician in Edmonton. **Dr Schipper** is an Assistant Professor in the Department of Family Medicine at the University of Alberta.

We designed such a study to determine whether cleaning the cervix with a cotton swab affects the quality of the Pap smear performed in the family practice setting.

METHODS

Study design and setting

This was a prospective, single-blinded randomized case-control study. Using an odd-even numbering system, female patients presenting for a routine Pap smear were randomly assigned to the Swab Group or the No Swab Group. Randomization was performed by the family practice nurse after patient consent was obtained and before a doctor saw the patient. Neither the physicians nor the patients were blinded to the study procedure; only the pathologist was blinded to the study. The study was conducted at 2 academic family medicine teaching units in the Department of Family Medicine at the University of Alberta in Edmonton and 1 community family practice site in Edmonton, Alberta. The clinicians performing the Pap test included 13 family physicians, 24 family medicine residents, and 1 nurse practitioner. The study was conducted from June 2002 to May 2003. Ethical approval for the study was obtained from the Health Research Ethics Board at the University of Alberta.

Patients and study procedures

The study sample consisted of consecutive female patients, 18 to 65 years of age (including prenatal patients), who presented for a routine Pap smear and consented to participate in the study. Women who had a previous hysterectomy were excluded. Before the Pap smear was taken, the cervix of each patient in the Swab Group was wiped with a cotton swab until free of visible mucus. Each patient in the No Swab Group did not have her cervix wiped with a cotton swab before the Pap smear, regardless of the amount of mucus present on the cervix. Orientation sessions on the study were provided to all physicians and the nurse practitioner. This included standardization of the Pap smear procedure using both spatula and cytology brush in sequence for each test.

Data collection and outcome measures

Data were collected prospectively on a data-collection form clipped on top of patients' charts. The family practice nurse noted on the form the patient's age, menopausal status, and the study group into which the patient had been randomized. At the time of the Pap smear, the physician recorded the appearance of the cervix in terms of its redness (normal, moderately red, or beefy red), friability (normal, friable, or very friable), and atrophy (yes or no), as well as the amount of mucus present on the cervix (dry cervix, light mucus, or heavy mucus).

The degree of severity of these conditions of the cervix was based on the subjective clinical assessment by the physician. When the pathology report was available, the study nurse obtained from the specimen report the following data: the quality of the Pap smear, the result of the Pap smear, and whether a repeat Pap smear was required. The quality of the Pap smear was determined by the presence or absence of adequate numbers of endocervical cells noted on the pathology report. An "inadequate" specimen report indicated that no or very few cells of any kind were present, and "adequate, but limited" was defined as having good cellular component (presence of other cells sampled), but no or very few endocervical cells seen. The former would suggest that a repeat smear be performed, and the latter would require a clinical decision on risk to determine how soon the next smear test would be indicated. Either case was reported by the pathologist as "repeat Pap smear required."

Data analysis

Data analysis was performed using SPSS 12.0 for Windows and consisted of frequencies and summary statistics. Differences between the 2 groups were tested using χ^2 and the Fisher exact test, where appropriate.

An α level of .05 was used to test for statistical significance. With a power of 80% and an α level of .05, our study sample size was sufficient to detect a reduction of greater than 46% in inadequate smears from the 1998 Alberta provincial baseline of 15%.⁴

RESULTS

There were 772 consecutive patients approached to take part in the study. A total of 156 (20%) declined or were excluded. Seventy (45%) of these 156 were excluded because of previous hysterectomy. A total of 616 patients were recruited into the study (ie, 300 in the Swab Group and 316 in the No Swab Group). The 2 groups were similar in age, menopausal status, the redness, friability and atrophy of the cervix, and the amount of mucus on the cervix (Table 1). There was no significant difference in the quality of the Pap smear in terms of the adequacy of endocervical cells between the Swab and No Swab

Table 1. Characteristics of Papanicolaou smear patients by study group

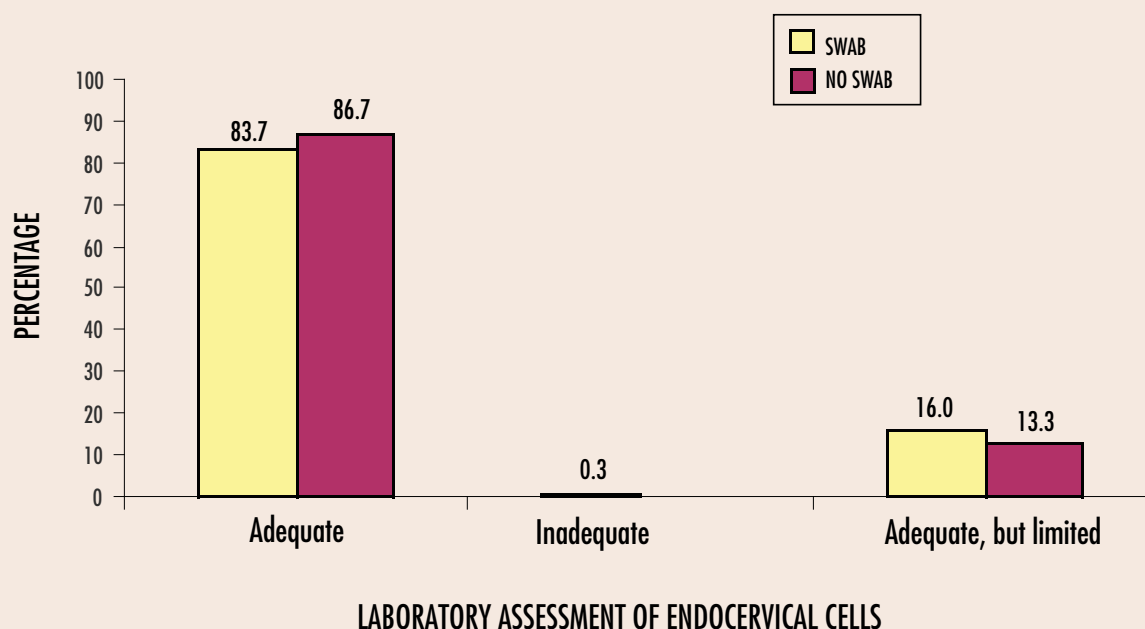
CHARACTERISTICS OF PATIENTS	SWAB (N = 300)		NO SWAB (N = 316)	
	N	%	N	%
Age				
• 18-49 y	255	85.0	271	85.8
• 50-65 y	45	15.0	45	14.2
Menopausal status				
• Premenopausal	231	77.0	245	77.5
• Postmenopausal	40	13.3	41	13.0
• Not recorded	29	9.7	30	9.5
Redness of cervix				
• Normal	216	72.0	218	69.0
• Moderately red	60	20.0	57	18.0
• Beefy red	3	1.0	13	4.1
• Not recorded	21	7.0	28	8.9
Friable appearance of cervix				
• Normal	212	70.7	198	62.7
• Friable	63	21.0	81	25.6
• Very friable	4	1.3	6	1.9
• Not recorded	21	7.0	31	9.8
Atrophic appearance of cervix				
• Yes	18	6.0	19	6.0
• No	257	85.7	256	81.0
• Not recorded	25	8.3	41	13.0
Amount of mucus				
• Dry cervix	17	5.7	25	7.9
• Light mucus	193	64.3	201	63.6
• Heavy mucus	65	21.7	62	19.6
• Not recorded	25	8.3	28	8.9

Groups (Figure 1). The rate of repeat Pap smears, as recommended by the pathologist, was similar between the groups (ie, 28.3% in the Swab Group and 25.0% in the No Swab Group). The main reason for recommended repeat Pap smears was limited cellular component (14.3% and 10.8%). Cellular changes accounted for 7.7% and 9.5% and other factors, such as patient's previous history, for 6.3% and 4.7% (Table 2).

Swabbing or not swabbing in the presence of varying degrees of mucus present did not affect the adequacy of endocervical cells (Table 3). There was also no difference between the groups in terms of adequacy of endocervical cells controlling for age, menopausal status, and friability, redness, or atrophy of the cervix.

DISCUSSION

This prospective, single-blinded randomized trial found that cleaning the cervix with a cotton swab before taking the Pap smear sample did not affect the adequacy of

Figure 1. Adequacy of sample**Table 2. Repeat Papanicolaou smears**

REASON FOR REPEAT PROCEDURE	SWAB (N = 300)		NO SWAB (N = 316)	
	N	%	N	%
Limited cells	43	14.3	34	10.8
Cellular changes	23	7.7	30	9.5
Other reasons	19	6.3	15	4.7
Number of repeat smears	85	28.3	79	25.0

endocervical cells on the conventional Pap smear. These findings are consistent with another study that reported no statistically significant difference in the quality of the Pap smear, in terms of adequacy of endocervical cells, when using a Weck-cel sponge to collect endocervical secretions.⁵ Our findings differ, however, from those of a recent Canadian study that found an association between cleaning with an oversized cotton swab and a lower frequency of smears with inadequate endocervical cells.³

Current guidelines of the Alberta Medical Association are undecided on the wiping of the cervix. They state that "excess mucus on the cervix may be removed with a cotton swab prior to sampling if this is a problem."⁶ Our study findings do not refute this position.

The necessary repeat of Pap tests because endocervical cells are absent from the sample is not a minor problem. Patients are inconvenienced by having to return and also by undergoing the procedure again. Their anxiety about the importance of the inconclusive result often

must be addressed by clinicians. The repeat test rates of 14.3% and 10.8% because of sampling issues are a marker of considerable patient distress.

It seems that the risk of removing diagnostic cells by swabbing is balanced by removing thick impenetrable mucus that the technician cannot see through. It might seem reasonable to advise removing heavy mucus and not swabbing a dry cervix, but the number of dry cervices in our study does not allow us to comment on this (Table 3).

This study had some limitations. The specific elements of the study design are strengths of this clinical trial. However, the numerous clinicians who performed the Pap smears, while reflecting the real-world situation, might have jeopardized the standardization of the Pap smear technique. Despite clinicians' standardized training, heterogeneous Pap smear techniques among clinicians might have contributed to non-significant findings. There might have been interobserver discrepancy in the subjective assessment by each clinician of the friability, redness, and amount of mucus on the cervix, thereby resulting in non-significant findings for these characteristics. The study findings apply only to conventional Pap smears and not to those obtained using liquid-based cytology. Furthermore, the study examines only a single outcome (smear adequacy) and not the comparative sensitivity of samples taken with or without swabbing.

Future studies should include randomization, multiple clinicians, and a larger sample size. If heterogeneous techniques did jeopardize standardization of Pap

Table 3. Laboratory report by group for various amounts of mucus

LABORATORY ASSESSMENT	DRY CERVIX SWAB		NO SWAB		LIGHT TO HEAVY MUCUS SWAB		NO SWAB	
	N	%	N	%	N	%	N	%
Specimen report								
• Adequate	15	88.2	23	92.0	218	84.5	227	86.3
• Inadequate	1	5.9	0	0.0	0	0.0	0	0.0
• Adequate, but limited	1	5.9	2	8.0	40	15.5	36	13.4
Pap smear result								
• Benign	17	100.0	20	80.0	219	84.9	230	87.5
• Benign cellular changes	0	0.0	5	20.0	24	9.3	24	9.1
• Cervical intraepithelial neoplasia grade 1	0	0.0	0	0.0	1	0.4	0	0.0
Other	0	0.0	0	0.0	14	5.4	9	3.4
Repeat Pap smear required								
• Yes	1	5.9	6	24.0	74	28.7	67	25.5
• No	16	94.1	19	76.0	184	71.3	196	74.5

smear techniques, better training might be required. The study should be repeated in another setting to confirm our findings.

CONCLUSION

Cleaning the cervix with a cotton swab does not appear to affect the quality of the Pap smear in terms of adequate samples of endocervical cells. This implies that the practice of wiping or not wiping the mucus from the cervix before taking the Pap smear can be at the discretion of the clinician.

Acknowledgment

We thank **Mary Wittenberg** for data entry and **Shufen Edmondstone** for secretarial assistance. The findings of this study were presented at the North American Primary Care Research Group (NAPCRG) meeting in Orlando, Fla, on October 12, 2004.

Contributors

Dr Hans was involved in the conceptualization of the study, development of the study design, data analysis and interpretation, and review of the manuscript. **Dr Cave** was involved in the conceptualization of the study, development of the study design, development of the data-collection form, data analysis and interpretation, and writing and reviewing the manuscript. **Ms Szafran** provided methodological support to the project and was involved in the development of the data-collection form, data analysis, and writing and reviewing the manuscript. **Dr Johnson** participated in the conceptualization of the study, development

of the study design, overseeing the pathology testing, and reviewing the manuscript. At the time of the study, **Ms Glass** was the research nurse who collected the data and reviewed the manuscript. **Drs Spooner, Klemka, and Schipper** participated in the conceptualization of the study, development of the study design, interpretation of the study findings, and review of the manuscript.

Competing interests

This project was funded by the Grey Nuns Family Medicine Research and Education Fund.

Correspondence to: Dr Andrew Cave, Department of Family Medicine, University of Alberta, 901 College Plaza, Edmonton, AB T6G 2C8; telephone 780 492-8102; fax 780 492-2593; e-mail andrew.cave@ualberta.ca

References

1. Marchand L, Van Dinter M, Mundt M, Dingel W, Klein G. Current cervical cancer screening practices of Dane County, Wisconsin primary care clinicians. *WMJ* 2003;102(3):35-40.
2. British Columbia Cancer Agency. *British Columbia Cancer Agency Annual Report 2000*. Vancouver, BC: British Columbia Cancer Agency; 2000.
3. Kotaska AJ, Matisic JP. Cervical cleaning improves Pap smear quality. *CMAJ* 2003;169(7):666-9.
4. Dynacare Kasper Medical Laboratories. *Pap smear reporting guidelines*. Edmonton, Alta: Dynacare Kasper Medical Laboratories; 2002.
5. Hildesheim A, Concepcion Bratti M, Edwards RP, Schiffman M, Rodriguez AC, Herrero R, et al. Collection of cervical secretions does not adversely affect Pap smears taken immediately afterward. *Clin Diagn Lab Immunol* 1998;5(4):491-3.
6. Toward Optimized Practice. *Screening for cervical cancer*. Edmonton, Alta: Toward Optimized Practice; 2007. Available from: <http://www.topalberta.doctors.org/top/cpg/cervicalcancer/cervicalcancer.htm>. Accessed 2007 Mar 16.
