

Effects of Lubricants Used at Speculum Examination on Conventional and ThinPrep Smear Results

Nilgün Güdücü¹, Herman İşçi², Alexandra Lieb³, Salim Karavelioğlu⁴, Zehra N Kavak⁵

ABSTRACT

Aims and objectives: We conducted a retrospective study to compare the rate of satisfactory conventional and ThinPrep smears with and without lubricant use.

Materials and methods: We reviewed smear test results of 5,126 patients retrospectively. Both conventional and ThinPreps were included.

Results: Overall, there was no difference between the two groups for satisfactory smear results. There was also no difference between smear groups in postpartum and postmenopausal patients. Lubricant use decreased satisfactory smear rate in ThinPrep smears (81.9% and 85.5%, $p = 0.038$). When ThinPrep smears were taken without lubricants, a statistically significantly higher rate of cervical dysplasia (2.5% and 3.6%, $p = 0.023$), nonspecific infection (64.9% and 69.2%, $p = 0.001$), trichomonas infection (0.3% and 0.9%, $p = 0.004$), and bacterial vaginosis (2.7% and 5.9%, $p = 0.001$) were detected.

Conclusion: Lubricants affect satisfactory smear results only in ThinPrep smears. Detection of cervical dysplasias, bacterial vaginosis, and trichomonas infections were higher when lubricants were not used.

Keywords: Cervical dysplasia, Infection, Lubricants, Smear, Speculum, ThinPrep.

Donald School Journal of Ultrasound in Obstetrics and Gynecology (2020): 10.5005/jp-journals-10009-1662

INTRODUCTION

Papanicolaou (Pap) smear test is a successful screening test that has reduced mortality rate of invasive cervical cancer more than 70% in developed countries where it is a standard part of preventive healthcare policies.¹ In developed countries, about 60% of women who lost their lives due to invasive cervical cancer had no Pap smear tests in the past 5 years prior to diagnosis.² One of the factors that decrease compliance with the screening programs is the pain felt during gynecological examinations, especially at speculum insertion.³ There is no hesitation to use lubricants at transvaginal ultrasonography and bimanual examination to reduce the discomfort, but classic gynecological teaching is reluctant to use lubricants at speculum insertion. Improper use of lubricants at speculum examination to decrease pain and improve compliance may interfere with processing and interpretation of both conventional and ThinPrep Pap smear tests.⁴⁻⁶ This may further increase the false-negative rate of Pap smear test that approached 50% in some studies.⁷ The aim of this study was to compare the rates of satisfactory conventional and ThinPrep smears with and without lubricant use.

MATERIALS AND METHODS

A retrospective review of the cytology reports performed by two gynecologists working for more than 10 years in our outpatient gynecology clinic covered a total of 5,126 cases between October 2009 and April 2013. The practice of Dr 1 is to introduce the metal speculum always with lubricants and the practice of Dr 2 is to introduce the metal speculum without any lubricants. The other physicians of our clinic use lubricants according to the presenting case and cytology reports of these clinicians were excluded. We compared the cytology reports of the two physicians for the effects of lubricants on Pap smear tests. Specimens were collected by a Cytobrush. Each report was again separated as conventional and

^{1,5}Department of Obstetrics and Gynecology, Academic Hospital, İstanbul, Turkey

²Department of Obstetrics and Gynecology, İstanbul Florence Nightingale Hospital, İstanbul, Turkey

³American University of Antigua, Antigua

⁴Department of Microbiology, Academic Hospital, İstanbul, Turkey

Corresponding Author: Nilgün Güdücü, Department of Obstetrics and Gynecology, Academic Hospital, İstanbul, Turkey, Phone: +90 0533 6404010, e-mail: nilgun.kutay@gmail.com

How to cite this article: Güdücü N, İşçi H, Lieb A, et al. Effects of Lubricants Used at Speculum Examination on Conventional and ThinPrep Smear Results. *Donald School J Ultrasound Obstet Gynecol* 2020;14(3):262-264.

Source of support: Nil

Conflict of interest: None

ThinPrep Pap smear test (ThinPrep^R 2000, Cytoc Corp, Marlborough, MA, USA and SurePath BD FocalPoint™ GS Imaging System, TriPath Imaging, Inc., Burlington, NC, USA). For conventional Pap smear, Cytobrush was applied to glass slides and was sprayed with a fixative. For ThinPrep smear, the Cytobrush was swirled and then placed in the specimen cup, the tip of the Cytobrush was left in the specimen cup according to the manufacturer's recommendations. In the last one year, smear tests were taken as ThinPrep. Bethesda system was used in the evaluation of reports. We searched the rate of satisfactory smears. Samples were recorded as unsatisfactory if no endocervical cells were present or if 75% of the epithelial cells were obscured by blood, inflammation, or artifact or if there was reduced cellularity (<5,000 epithelial cells for ThinPrep). We evaluated the rates of secondary outcomes as vaginal infections and cervical dysplasias. Age, being in postmenopausal status (women not menstruating for more than 1 year), and postpartum

period (smear test within 2 months after delivery) during specimen collection were noted as confounding variables. Patients who have had hysterectomy were excluded. The study protocol was in confirmation with the ethical guidelines of Helsinki Declaration.

Statistical analyzes were performed using the NCSS (National Council for the Social Studies) 2007 and PASS (power analysis and sample size) 2008 statistical software (Utah, USA). Data showing anthropometric parameters were presented as mean±standard deviation. Parameters showing normal distribution were compared with Student T test, other parameters were compared with Pearson Chi-squared test.

RESULTS

Mean age of the patients was 40.04 ± 11.68 years (17–95). Table 1 shows that patients whose smears were taken without lubricant use had a statistically significantly higher rate of cervical dysplasia (2.5% and 3.6%, $p = 0.023$), nonspecific infection (64.9% and 69.2%, $p = 0.001$), trichomonas infection (0.3% and 0.9%, $p = 0.004$), and bacterial vaginosis (2.7% and 5.9%, $p = 0.001$). There was no difference between the two groups for satisfactory smear results.

Table 2 shows satisfactory smear results in postpartum and postmenopausal women, there was no difference between the two groups in this patient population. Overall, there was no difference between the two groups for satisfactory smear results but patients who had ThinPrep smears without lubricant use had statistically significantly more satisfactory smear results when compared to patients with lubricant use (85.5% and 81.5% respectively, $p = 0.038$).

DISCUSSION

In this study, we found statistically significantly more satisfactory smear results in ThinPrep smears taken without lubricant use but in conventional smears, there was no difference between the two

groups. Investigations to date have demonstrated that lubricants changed the smear results,^{4–6,8–10} but other studies reported contradictory results^{11–17} Not only did physician applied lubricants cause interpretation errors, but also, vaginal creams, douching, spermicides, foreign-bodies, and over-the-counter lubricants used personally were reported to interfere with the results.^{10,17} In this study, the physician applied a small amount of lubricant on both blades of the speculum and he introduced it without contaminating the external cervical os for many years, but when the residents, nurses, or clinicians with different levels of experience are involved, the results may change. A previous study reported higher unsatisfactory smear results with residents.⁵ Other studies searched for the improper use of lubricant, overlaying the lubricant to both blades,¹⁸ only superior blade,⁵ or only inferior blade¹² were searched; in all cases, the satisfactory smear results did not change with lubricant use.

Lubricants were proposed to interfere with processing of ThinPrep smears by adhering to and plugging the semipermeable membrane of the filter, this may prevent transfer of cells to the slide.¹⁰ Previous studies comparing lubricant use in ThinPrep smears reported both higher interpretation error and also no difference between the two groups.

In low risk populations, the rate of atypical squamous cells of undetermined significance (ASCUS) should be less than 5%.¹⁹ Our population was a low risk population and cervical dysplasia rate was similar to those of previously reported studies.⁵ Prevalence of cervical intraepithelial lesions increased in the presence of endocervical cells.²⁰ In our study, rate of cervical dysplasia was higher in the group that did not use lubricant, but in previous studies, there was no difference between the groups.^{5,12}

Patients who are in the postmenopausal or postpartum period may especially have more discomfort during speculum examination due to vaginal dryness. Previous studies reported beneficial effect of lubricants during examination in postmenopausal patients but not in premenopausal patients.²¹ These patients may benefit from

Table 1: Comparison of patients with and without lubricant use during smear test

	Lubricant used		Lubricant not used		Total		p value
	n	(%)	n	(%)	n	(%)	
Cervical dysplasia							
AGUS	4	0.1	1	0.04	5	0.10	
ASC-H	6	0.2	6	0.3	12	0.2	
ASCUS	45	1.6	50	2.1	95	1.9	
HGSIL	5	0.2	6	0.3	11	0.2	
LGSIL	10	0.4	21	0.9	31	0.6	
Normal	2,719	97.5	2,253	96.4	4,972	97.0	0.023*
Conventional	1,809	64.9	1,461	62.5	3,270	63.8	0.082
ThinPrep	980	35.1	876	37.5	1,856	36.2	
Infection	1,810	64.9	1,618	69.2	3,428	66.9	0.001**
Satisfactory smear	2,358	84.5	2,017	86.3	4,375	85.3	0.076
Postmenopausal	389	13.9	351	15	740	14.4	0.277
Postpartum	299	10.7	55	2.4	354	6.9	0.001**
<i>Trichomonas</i>	8	0.3	22	0.9	30	0.6	0.004**
Bacterial vaginosis	74	2.7	137	5.9	211	4.1	0.001**

Pearson's Chi-squared test

* $p < 0.05$, ** $p < 0.01$

AGUS, atypical glandular cells; ASCUS, atypical squamous cells of undetermined significance; ASC-H, atypical squamous cells-HGSIL cannot be excluded; LGSIL, low-grade squamous intraepithelial lesion; HGSIL, high-grade squamous intraepithelial lesion

Table 2: Comparison of patients with and without lubricant use during smear test for satisfactory smear results

	Satisfactory smear	Lubricant used		Lubricant not used		p value
		n	(%)	n	(%)	
Postpartum (n = 354)	Yes	220	73.6	38	69.1	0.491
	No	79	26.4	17	30.9	
Postmenopausal (n = 740)	Yes	176	45.2	139	39.6	0.121
	No	213	54.8	212	60.4	
Conventional smear (n = 3270)	Yes	1,555	86.0	1,268	86.8	0.492
	No	254	14.0	193	13.2	
ThinPrep smear (n = 1856)	Yes	803	81.9	749	85.5	0.038*
	No	177	18.1	127	14.5	

Pearson's Chi-squared test * $p < 0.05$

lubricant use. According to our results, there was no difference between the two groups in satisfactory smear results in these two special groups. Satisfactory smear results decreased to half in postmenopausal women when compared to the whole population, this is in contrast to a previously reported study.⁵

In our study, the rate of infection was higher in the group where lubricants were not used, but a previous study reported contradictory results⁵ and another study found no difference between the groups.¹¹

The strength of this study was the performance of sampling only by two physicians, this decreased the risk of sampling error due to experience, but there was no randomization and two different sampling practice without randomization might create another bias. Another strength was the large number of participants. To the best of our knowledge, ThinPrep and conventional smear were compared for the effects of lubricants by only one study previously. This increased the contribution of this article to the literature.

One of the limitations of this study is its retrospective nature, we cannot be sure about the use of lubricants and vaginal medications by patients prior to obtaining the samples.

In conclusion, lubricants affect satisfactory smear results only in ThinPrep smears. Detection of cervical dysplasias, bacterial vaginosis, and trichomonas infections were higher when lubricants were not used.

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