

A Randomised Comparison of three papsmear collection Methods

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Summary: Three hundred and forty eight Pap smears were collected by three different methods i.e., by Ayre's Spatula, Cytobrush and Cotton Swab. The use of Ayre Spatula in routine pap smear screening is equally effective in obtaining adequate smears when compared to its combined use with cytobrush or cotton swab stick. However, selective use of cotton swab stick with Ayre spatula can yield marginally improved results in some women.

Introduction

The papanicolaou smear is an inexpensive, effective screening tool used to detect cervical cancer in the preinvasive stage. Because most neoplastic epithelial abnormalities arise at or near the squamo-columnar junction, the reliability of the cervical cytology strongly depends on the proper sampling of this area which is evidenced by the presence of endocervical cells. Many studies have demonstrated that the endocervical brush obtains samples that contain endocervical cells more effectively than spatulas or cotton tipped swabs (Boon, et al 1986, Taylor, et al 1987, Kavak, et al 1995). The present study was taken up to compare the effectiveness of cytobrush with that of the cotton swab and Ayre spatula; the latter is used routinely for all patients attending the gynaecology outpatient department.

Material and Methods

This study was conducted in the department of Obstetrics and Gynaecology of Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry. The study group included all patients attending outpatient department between Jan 1997 to April 1997. The women with invasive cancer or those after total hysterectomy were excluded.

We conducted a randomized trial to compare 3 techniques for collecting pap smears. The smears were collected in the first group with a cytobrush (Detecta, contech devices (P) Limited) and Ayre spatula, in the second group with a cotton swab and Ayre spatula and with only Ayre spatula in the third group. All smears were performed by the residents and the staff nurses all of whom had previously been instructed about the proper technique with each device. All the smears were taken by Ayre spatula and were combined with cytobrush in 116 patients, with cotton swab in 93, and Ayre Spatula alone was used in 139 patients. The smears in the combined methods were taken by the cytobrush or cotton swab followed by Ayre spatula and spread on the same slide. The reporting was done according to Bethesda classification. The smears showing adequate number of endocervical cells and not obscured by blood or air drying were reported as "adequate" while those showing no endocervical cells, too thick or obscured by blood or inflammatory cells were reported as "inadequate".

The demographic data obtained at the time of pap smear included age, parity, last menstrual period or menopausal status, oral contraceptives, intrauterine device and per speculum and per vaginal findings. All the smears were evaluated by the same cytopathologist who was blinded to the sampling device. The results were analysed applying X² test and test of proportion.

Results

Three hundred and forty eight pap smears were collected during the period of 6 months. The mean age was 35 years. The number of adequate or inadequate smears by 3 different methods are shown in Table - 1. It was noted that though the number of adequate smears was higher in cytobrush and cotton swab as compared to Ayre's spatula alone, the difference was not statistically significant with P value <0.1 & >0.05 which cannot be ignored altogether ($p < 0.1$ & > 0.05) when X^2 test and test of proportion were applied.

Table 1

Adequate	No.	% age	Inadequate No.	%age Total
Ayre's Spatula	82	(58.99)	57 (40.01)	139
Cytobrush	75	(64.66)	41 (35.34)	116
Cotton swab	59	(63.44)	34 (36.55)	93

Comparative Analysis of Adequate or Inadequate Smears; by three different methods.

The number of abnormal smears showing intra-epithelial lesions are shown in Table - II. The detection rate in cytobrush technique was 3.4% including one case of adenocarcinoma as compared to 2.1% with cotton swab and Ayre spatula. The number of inflammatory smears was very high i.e. 178 out of 348 (51%) with severe inflammation in 70 cases.

Table II

	CIN1	CIN2	CIN3	Adenocarcinoma
Ayre's spatula	2	-	1	-
Cytobrush	1	1	1	1
Cotton swab	-	1	1	-

Intra Epithelial lesions seen by three different methods.

Discussion

The false negative rate of papanicolaou smear is estimated to be in the range of 1.1% to 69% (Pairwuti, 1991). Because the squamocolumnar junction is at greatest risk of having neoplasia, adequate sampling of this area is necessary to assure the high sensitivity of pap smear.

The ideal instrument used to collect pap smear should provide adequate ectocervical and endocervical cellular material without undue mucosal damage to the cervix and without inducing bleeding that could obscure cytologic evaluation. These factors may also be presumed to help in increasing the detection rate of cervical intraepithelial neoplasia. Several authors have reported that the cytobrush improves endocervical sampling after comparing results with cotton swab when used with Ayre spatula. Boon et al (1986) found that the addition of cytobrush with modified Ayre's spatula in 5,716 smears increased the percentage of smears containing cells from the transformation zone from 84 to 98%. Similarly, Taylor et al (1987) and Koonings et al (1992) also corroborated these findings and improved the endocervical cell yield from 82 to 98% and from 57% to 63% respectively by replacing cotton swab with the cytobrush. At the same time, they also noted an increase in the proportion of abnormal smears.

The present study has compared Ayre spatula alone with combined use of cytobrush or cotton swab along with Ayre spatula which none of the previous studies have done. Recent study by Kavak et al (1995) compared cervix brush and cytobrush with cotton swab and supported the findings of Boon et al (1986), Taylor et al (1987) and Koonings et al (1992). They found cotton swab to be the poorest method for collecting endocervical cells.

The number of adequate smears found in the present study was 63.41% by cotton swab plus Ayer spatula as compared to 64.61% by cytobrush and Ayer spatula and 59% by Ayre spatula alone. This, difference is not

statistically significant. The only explanation for the high number of inadequate smears in the cytobrush plus Ayre spatula group could be the faulty method of spreading the smear on the same slide with the result that many smears were reported as too thick or dry smears. Presence of inflammatory cells in more than 80% of these smears may be another explanation for obscuring the view of endocervical cells. Similar results have been reported by a very large study done by McCord et al (1992) involving pregnant and nonpregnant women and comparing four sample collection methods. Though they showed that the optimal and adequate smears were increased for the cytobrush spatula and Bayne Brush versus the cotton swab-spatula in pregnant patients, the difference in these 4 groups was not statistically different in the non-pregnant patients. Also, the detection of cervical dysplasia was constant for all pap smear sampling groups.

As the use of cytobrush is not feasible due to financial constraints for our routine screening of a large number of women, cotton swab along with Ayre spatula may be recommended for the increasing the percentage of adequate smears. Secondly, the treatment of vaginal infections seems to be essential before taking the pap smear as the number of inflammatory smears was very

high which could have obscured the visualisation of endocervical cells.

Conclusion

Use of Ayre spatula in routine pap smear screening is equally effective in obtaining adequate smears when compared to its combined use with cytobrush or cotton swab stick. However, selective use of cotton swab stick with Ayre spatula can yield marginally improved results in some women.

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