

ASSESSMENT OF PAP SMEAR QUALITY BY AYRE'S SPATULA VERSUS AYRE'S SPATULA PLUS CYTOBRUSH COMBINATION - ANALYSIS IN A TERTIARY CARE HOSPITAL

MeghanaRao

Associate Professor, Department of Obstetrics and Gynecology, Prathima Institute of Medical Sciences, Naganoor, Karimnagar
Address for communication: Dr. MeghanaRao, 304, SSA residency, H.No.2-9-8, Mukharampura, Karimnagar-505001, Telangana State. Email: meghanaraodr@gmail.com

Abstract

Background: Papanicolaou (Pap) smear is a very important screening tool for cervical cancer. The challenge for Pap smear is a high rate of false-negative results. Of the several factors compounding this problem the most important one is the incorrect sampling method and sampling tool limitations. We in the present study tried to evaluate the quality of Pap smear samples obtained by two methods Ayres Spatula and Ayres spatula plus cytobrush combination.

Methods: This cross-sectional study was conducted in the Department of Obstetrics and gynecology, Prathima Institute of Medical Sciences, Nagunoor, Karimnagar. The patients were selected from those who were attending the OPD of the Department of gynecology. A total of n=155 women who were sexually active in reproductive age or menopausal were included in the study. Two samples were taken first using Ayres spatula and then the cytobrush.

Results: With cytobrush and Ayres spatula n=135(87.09%) of smear were satisfactory compared to the n=98(63.22%) with Ayres spatula alone the p values were found the <0.01 which is considered as significant. Inadequate smear quality due to absent endocervical cells was found in n=12 (7.74%) of the combination and n=80(51.61%) in Ayres spatula alone the p values were also found to be significant. Blood obscuring the slide was found in n=1(0.64%) of spatula and n=3(1.93%) of the combination. A comparison of cytological results by two methods showed n=1(0.6%) of spatula smear versus n=2(1.29%) of combined cytobrush-spatula smears showed atypical squamous cells of undetermined significance. Low-grade Squamous Intraepithelial Lesions were found in n=3(1.93%) of spatula versus n=10(6.45%) of combined smears. High - grade Squamous Intraepithelial Lesions were found in n=1(0.6%) of spatula smear versus n=3(1.93%) of the combined smear.

Conclusion: that the ability of Ayres spatula and cytobrush combination was more effective in obtaining adequate specimens and it has a better ability to obtain the endocervical cells. The added advantage of the cervical brush is it could be easily used in postmenopausal women who tend to have stenoticos. Therefore this method must be used for screening programs.

Keywords: Ayre's Spatula, cytobrush, Pap smears

Introduction

Cervical cancer is one of the important issues related to women's health and it is a preventable disease. It is estimated that nearly 190,000 women die from this disease each year in developing countries [1]. The estimated figures show that 527,600 new cases and 265700 deaths worldwide occurred in 2012 [2]. Cervical smear cytology is considered one of the efficient methods for the detection of cervical cancers. It has been found that after implementation of the screening programs there have been reductions in both the incidence and mortality due to cervical cancers[3-5]. The Pap smear in ideal conditions the specificity is fairly satisfactory for the detection of precancerous lesions[6]. However, it does have potential does have the potential for sampling and preparation errors, which may lead to a diagnosis of false-negative results. The cervical sampling device plays a crucial role in the quality of the sample obtained [7]. It has been shown that approximately 60% of false-negative reporting is associated with the type of device [8-9]. The capacity of the device for obtaining sample cells depends on the shape of the device and material of the device [10]. An ideal sample device should collect a sufficient amount of cells from the cervix and the squamocolumnar junction with minimum discomfort and mucosal injury[11, 12]. Various sampling devices have been evaluated in studies with a particular interest in cytobrush + Ayre's spatula combination[7]. Some studies have used the cervix brush which has been proven useful for the collection of ectocervical and endocervical cell sampling [7, 13]. However, it has been shown that cytobrush has a better efficiency in collecting a greater percentage of endocervical cells [14]. According to FOGSI and national cancer control program developing countries should achieve the highest possible target coverage rates of 80%[15-17]. As per WHO model screening of cervical cells for every woman should be done once at the age of 45 years and it possible the screening program should cover women of 35, and 55 years[18]. With this background, we in the present study tried to evaluate the quality of pap smears obtained by two methods in the patients undergoing cervical cancer screening in our tertiary care hospital.

Material and Methods

This cross-sectional study was conducted in the Department of Obstetrics and gynecology, Prathima Institute of Medical Sciences, Nagunoor, Karimnagar. The patients were selected from those who were attending the OPD of the Department of gynecology. Institutional Ethical committee permission was obtained for the study as per protocol. Written consent was obtained from the participants of the study after explaining the nature of the study in their local language. A total of n=155 women who were sexually active in reproductive age or menopausal were included in the study. Exclusion criteria were menstruating women, pregnant females, those who have undergone a hysterectomy, vaginal infections, usage of a vaginal pessary, cream, tampon, sexual intercourse within the last 24 hours. A detailed history and clinical examination were done including the date of the last menstrual cycle or recent pregnancies were noted. The women are made to lie comfortably on the examination couch in the dorsal or lateral position and a speculum was introduced into the vagina to expose the cervix and the light source

is adjusted to visualize the cervix. Two samples were taken first using Ayres spatula and then the cytobrush. The Ayres spatula was introduced with the pointed end in the cervical os and rotated 360 degrees the sample obtained was the spread on two slides marked as I and II respectively. Cytobrush was then introduced into the cervical canal up to point when only a few bristles were seen outside the os. The brush was rotated to 180 degrees and the brush material was fixed on the slide labeled as II. The slides were fixed with 95% Alcohol in both cases. The slides were then sent to the Department of Pathology where they were stained with Pap stain and all the slides were then reported by a cytopathologist. The slides were reported following The Bethesda system (2001) (TBS) of reporting. [6] Those with suspected lesions biopsy were obtained and histopathology diagnosis was obtained.

Image 1: Ayre's Spatula Image 2: Cytobrush



Results

Out of the total n=155 patients, most of the patients were from the age groups 36 – 40 years n=50(32.25%) followed by 31 – 35 years n=45(29.03%). This is the age group where the women are very active sexually, which starts to decline as the years advance. It is during this period that a woman should be alert regarding her sexual health. The overall mean age was 38 years and the mean parity was 2.5 and the mean age at Menarche was 13 years and the mean age of married life was 8.9 years shown in table 1.

Table 1: Demographic profile of the cases in the study

Sl No	Age group	Number (%)	Mean parity	Mean Age at Menarche (years)	Mean Years of married life
1	21 - 25	13(8.38)	2	13.5	3.5
2	26 - 30	22(14.19)	2	12.8	5
3	31 – 35	45(29.03)	3	13.0	7
4	36 - 40	50(32.25)	3	13.2	10
5	41 - 45	15(9.67)	3	12.5	13
6	46 - 50	10(6.45)	2	13.0	15

There was a significant difference in Pap smear quality between the two collections by two methods. With cytobrush and Ayres spatula n=135(87.09%) of smear were satisfactory compared to the n=98(63.22%) with Ayres spatula alone the p values were found the <0.01 which is considered as significant. Inadequate smear quality due to absent endocervical cells was found in n=12 (7.74%) of the combination and n=80(51.61%) in Ayres spatula alone the p values were also found to be significant. Blood obscuring the slide was found in n=1(0.64%) of spatula and n=3(1.93%) of the combination shown in table 2.

Table 2: Showing the smear quality assessment by two methods

Smear Quality	Ayre's Spatula		Cytobrush + Ayre's Spatula		P Values
	Number (N)	Percentage	Number (N)	Percentage	
Satisfactory	98	63.22	135	87.09	<0.01*
Unsatisfactory (repeat smear)	10	6.45	5	3.22	>0.1
Absent endocervical cells	80	51.61	12	7.74	<0.001*
Absent squamous cells	0	0.00	0	0.00	-
Blood obscuring the slide	1	0.64	3	1.93	>0.5

* Significant

A comparison of cytological results by two methods showed n=1(0.6%) of spatula smear versus n=2(1.29%) of combinedcytobrush-spatula smears showed atypical squamous cells of undetermined significance.Low-grade Squamous Intraepithelial Lesions were found in n=3(1.93%) of spatula versus n=10(6.45%) of combined smears. High -grade Squamous Intraepithelial Lesions were found in n=1(0.6%) of spatula smear versus n=3(1.93%) of combined smear shown in table 3.

Table 3: Showing the cytological changes in the Pap smear by two methods

Cytological changes	Ayre's Spatula		Cytobrush + Ayre's Spatula	
	Number (N)	Percentage	Number (N)	Percentage
ASCUS	1	0.6	2	1.29
AGCUS	0	0.0	1	0.6
LSIL	3	1.93	10	6.45
HSIL	1	0.6	3	1.93
SCC	0	0.0	0	0.0

Atypical Glandular Cells Of Undetermined Significance (AGCUS), Atypical squamous cells of undetermined significance (ASCUS), Low-grade Squamous Intraepithelial Lesion (LSIL), High-grade Squamous Intraepithelial Lesion (HSIL); Squamous Cell Carcinoma (SCC).

A correlation of biopsy was done in n=5 patients of Pap smears with Ayres spatula alone showing dysplastic changes.Among the n=3 cases of LISL histological diagnosis was normal in n=1 Chronic cervicitis in n=1 and CIN I in n=1 case. The n=1 case of HISL was diagnosed as CINII by histological diagnosis. N=1 case of ASCUS was found to be chronic cervicitis by the histological report given in table 4.

Table 4: Correlation of cytology with Biopsy in Ayres spatula smears

	Cytological diagnosis	Histological Diagnosis					
		Normal	Chronic cervicitis	CIN I	CIN II	CIN III	SCC
Benign changes	0	0	0	0	0	0	0
LSIL	3	1	1	1	0	0	0
HSIL	1	0	0	0	1	0	0
SCC	0	0	0	0	0	0	0
ASCUS	1	0	1	0	0	0	0

Atypical Glandular Cells Of Undetermined Significance (AGCUS), Atypical squamous cells of undetermined significance (ASCUS), Low-grade Squamous Intraepithelial Lesion (LSIL), High-grade Squamous Intraepithelial Lesion (HSIL); Squamous Cell Carcinoma (SCC).

A total of n=16 biopsies were obtained from patients with dysplastic changes in cytological smears by Cytobrush + Ayre's Spatula combination. In n=10 cases of LSIL by cytology histological reports showed n=4 cases with chronic cervicitis, CIN I in n=2 and CIN II in n=2 CIN III in n=1 and SCC in n=1 cases each. The n=2 cases of ASCUS were diagnosed as n=1 case of chronic cervicitis and n=1 case of CIN I. The n=1 AGCUS was diagnosed as CIN I by histological diagnosis. The HSIL n=3 cases were diagnosed as n=1 cases each of CIN II, CIN III, and SCC has shown in table 5.

Table 5: Correlation of cytology with Biopsy in Cytobrush + Ayre's Spatula combination

	Cytological diagnosis	Histological Diagnosis					
		Normal	Chronic cervicitis	CIN I	CIN II	CIN III	SCC
Benign changes	0	0	0	0	0	0	0
LSIL	10	0	4	2	2	1	1
HSIL	3	0	0	0	1	1	1
SCC	0	0	0	0	0	0	0
ASCUS	2	0	1	1	0	0	0
AGCUS	1	0	0	1	0	0	0

Atypical Glandular Cells Of Undetermined Significance (AGCUS), Atypical squamous cells of undetermined significance (ASCUS), Low-grade Squamous Intraepithelial Lesion (LSIL), High-grade Squamous Intraepithelial Lesion (HSIL); Squamous Cell Carcinoma (SCC).

Discussion

The Pap smear has been utilized for cervical cancer screening for more than 60 years now. The sensitivity of cervical screening is limited by sampling errors and the reported incidence of false-negative rates is from 1.5 to 55% [19]. The adequacy of cervical smear is judged by the presence or absence of endocervical cells since it is a common and easily measured endpoint. The presence of these cells suggests that the transformation zone from which the premalignant change usually arises has been sampled. In the present study, a significant number of satisfactory smears were obtained with combined (cytobrush + spatula) (87.09%) compared to

the Ayre's spatula (63.22%). Buntinx et al; [20] in their study found satisfactory smears in 95.3% in the cytobrush samples and 83.8% in the spatula smears. Tewari et al; in the study found 57% satisfactory smear when cytobrush was used compared to 22% when Ayre's spatula was used [21]. Endocervical cells were absent in about 36% of smears in the cytobrush group and 75% in the spatula group. It was concluded that the endocervical brush is better for smears and gives a better quality smear. In the present study, positive pathology was seen in 16 cases (10.32%) among the smears taken by cytobrush and spatula compared to 5 cases (3.2%) in the spatula smears, and this was statistically significant. RR Kinia et al; [22] found that cytobrush was able to extract immature lesion located higher in the endocervical canal and the ability to detect abnormalities of the columnar epithelium was superior. They found positive pathology in 4% of samples in the cytobrush group as compared to 3.8% in the spatula group. In this study, LSIL was found in n=10(6.45%) combination versus n=3(1.94%). The HSIL was n=3(1.94%) in combined versus n=1(0.6%) of the spatula group. Boon M et al; [23] in a randomized trial showed that mild dysplasia was 0.7% for cytobrush and spatula group versus 0.57% for the spatula group they concluded that the pickup rate of cytobrush group was more. The HISL reports from the combined cytobrush and Ayre's spatula showed CIN II, CIN II and SCC one in one case each by histopathological examination. Studies conducted to compare the cytobrush and Ayre's spatula has found that the cytobrush and spatula found that endocervical cells were collected more effectively with this combination [24, 25].

Conclusion

From the present study, we concluded that the ability of Ayres spatula and cytobrush combination was more effective in obtaining adequate specimens and it has a better ability to obtain the endocervical cells. The added advantage of the cervical brush is it could be easily used in postmenopausal women who tend to have stenoticos. Therefore this method must be used for screening programs.

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