

## CAN THE USE OF AYER'S SPATULA AND CYTOBRUSH IN COMBINATION, IMPROVE THE ADEQUACY OF CERVICAL SMEARS.

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### Abstract

**Background:** The most common cancer affecting women in developing countries is cervical cancer. The most effective tools of cancer detection is cervical smears. The present study is done to see whether the combination two devices can increase the adequacy of smears, The Ayer's spatula is good sampling device but for sampling endocervical cells it is not that useful, therefore Cytobrush is used in combination to improve the adequacy as it is most efficient in sampling the endocervical cells. **Material and methods:** The collection of cervical smears was done by combination of Ayer's spatula and Cytobrush. They were fixed in 95% ethanol and stained by Papanicolaou's stain. **Results:** In this study 387 (96.75%) smears were satisfactory and 13(3.25%) were unsatisfactory smears.

**Conclusion:** The combination is better than the devices used alone. The cost is limiting factor in developing countries, but it can be brought down by others ways.

**Key words :** Pap's smear, Adequacy, Cytobrush, Ayer's spatula, and Bethesda system

### INTRODUCTION

The WHO (2000) report states that cervical cancer is the most common cancer-affecting women from the developing countries.<sup>1</sup> More than 130,00 new cases of cervical cancer (Roughly one fourth of world's cases of cervical cancer) are reported in India every.<sup>2</sup>

It can be stated without any equivocation that the cervical smear is one of the most effective tools of cancer detection and screening. The principal goal of the cervical smear is to diagnose overt cancer, but to detect occult carcinomas that may lead to invasive cancer. Therefore this study was done to address the issue obtaining the adequate smear. The presence of endocervical cells is accepted as an indicator of an adequate smear, as endocervical-negative smears are less likely to detect any cytological abnormality that may be present, especially if the abnormality is severe.<sup>3</sup> Since the Ayre spatula was developed in 1947 it has been widely used, although up to 40% of smears may not contain endocervical cells.<sup>4</sup> Various sampling (cell collection) devices have been used to obtain a better yield from the transformation zone.<sup>3</sup> This study is designed to see whether combination of two commonly used devices in this study Ayer's Spatula and Cytobrush is significantly better than these devices used alone<sup>5</sup>.

### MATERIALS AND METHODS

This is a prospective, cross-sectional study of one year duration from June 2009 to June 2010. For collection of cases for this study, participants were recruited from patients attending the Gynaecology and Obstetrics OPD in Civil Hospital, Belgaum.

The material was collected from the Ecto and Endo cervices with the Ayer's spatula and Cytobrush respectively and smears were made on two different slides as it was more convenient. All the cases ranged from 22 to 75 years of age and total of 400 participants were recruited for this study plus an additional eleven pilot cases were included.

The cases with excessive vaginal discharge or bleeding, patients who had undergone hysterectomy and pregnant women were excluded from the study group. All the participants were informed about the study and duly signed informed consent in the presence of a witness was taken.

The collection of material from the participants was done by gynaecological staff and assisted by a trained para medical personal. The material from the ectocervix was taken with the help of Ayer's spatula, one glass slide of 75mm×25×1.35 mm dimensions and labelled it as 'Ecto' and similarly on another slide smear from endocervix was prepared by using the Cytobrush and was labelled as 'Endo'.

The slides were then immediately fixed in a fixative, 95% alcohol for half an hour. Then these slides were stained by using PAP stain according to Papanicolau's laboratory method<sup>6</sup>. These cases were reported on The Bethesda system.2001

## RESULTS

The total of 400 cases was collected along with eleven pilot cases making it a total of 411 cases ranging from 20-75 years.

### Age Distribution

The age was analysed by dividing it into different groups. This was done by dividing them into six groups at regular interval of 10 years starting from 18 years of age. Most of participants were in the age group of 29-38 years, having 163 (40.75%) participants followed by 18-28 years age group having 118(29.5%) participants, and the least number of participants were in age groups of 69-78 years accounting to be just only 3 (0.75%).

Table1: Distribution of cases according to different age groups

| Age groups | No of Cases | %     |
|------------|-------------|-------|
| 18-28      | 117         | 29.25 |
| 29-38      | 163         | 40.75 |
| 39-48      | 77          | 19.25 |
| 49-58      | 24          | 6.0   |
| 59-68      | 16          | 4.0   |
| 69-79      | 3           | 0.75  |
| Total/400  | 400         | 100   |

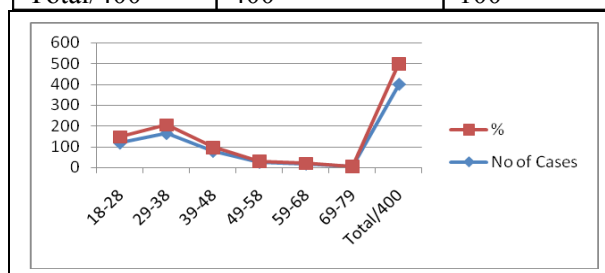


Figure1: Shows the graph distribution of cases according to different age groups

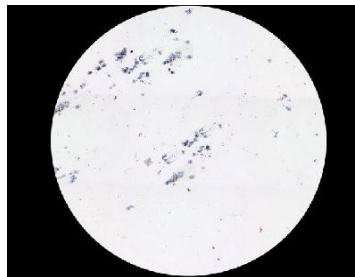
## Specimen Adequacy

In this study 387 (96.75%) smears were satisfactory and 13(3.25%) were unsatisfactory smears. The adequate smears were those which had both squamous and glandular well visualised cells above or equal to the minimal cellularity criterion laid by 2001 Bethesda system without any obscuring blood, inflammation and without any breakage of the slides

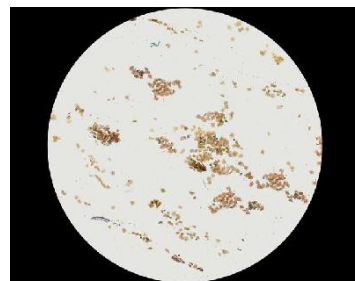
Table2: Distribution of satisfactory and unsatisfactory smears according to age groups

| Total | Satisfactory smears | %     | Unsatisfactory smears | %    |
|-------|---------------------|-------|-----------------------|------|
| 400   | 387                 | 96.75 | 13                    | 3.25 |

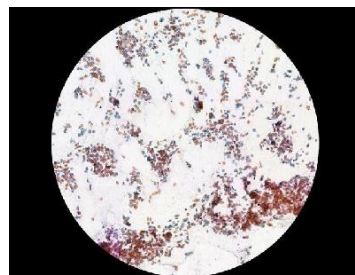
In this study for assessing minimal cellularity of squamous minimal cellularity of squamous few referral microphotographs were used. For this initial examination was done under 4× and criteria followed is summarised in table3. The majority of satisfactory cases had around 1000 cells followed by cases having 700 cells, followed by cases having 1400 cells, and cases having 150 cells hence 8, 12, 6 all 4× fields respectively screened. In case of glandular cellularity all the cases which were taken as satisfactory had well visualised 10-20 endocervical cells, squamous metaplastic were seen. (Slides1,2,3).



Slide1: shows low power of squamous cellularity of 150 cells



Slide2: shows low power of squamous cellularity of 1000 cells



Slide3: shows low power of squamous cellularity of 1400 cells

In this study there were 13(3.25%) unsatisfactory smears out of which the majority (10 cases) of smears having obscuring inflammation and blood and followed by few (2 cases) had less than minimal squamous cell squamous cell cellularity which were from elderly women and 1 slide was broken

Table 3: Shows the criteria of count squamous cellularity

| No of Cells | No of 4× fields | Interpretations     |
|-------------|-----------------|---------------------|
| 75          | All             | Unsatisfactory      |
| 150         | All             | Minimal Cellularity |
| 500         | 16              | Satisfactory        |
| 1000        | 8               | Satisfactory        |
| 1400        | 6               | Satisfactory        |

## DISCUSSION

The objective of this study is simple i.e, to determine the adequacy of conventional cervical smears by using the combination of Ayer's spatula and Cytobrush as cervical sampling devices. The gynaecologist and cytopathologist are part of a team who have to work towards one common aim that is improving patient compliance and hence ensuring proper and early treatment thereby helping the patient.

For this purpose there was an effort to take adequate smears and to reduce the numbers of unsatisfactory smears. This led to the invention of different types of cervical sampling devices which were of different shapes and sizes. It was found that only when these devices were used in combination efficacy and hence the adequacy improved.<sup>8</sup>

Later, work was conducted to find the better combination. One of the studies analysed the data from different studies and showed that combination of Ayer's spatula and Cytobrush performed significantly better than the combination of Ayer's spatula and cotton swab.<sup>4</sup>

The present study is done by keeping two factors in mind. First and foremost concerns the gynaecologists. They are the ones who first come in contact with the patient, so they should be given a sample and clear picture of the benefit of using the combination of devices. In the present study the number of satisfactory smears was 387 (96. 75%). This result is comparable to that found in Meta-analysis of 34 randomised control trials investigating cervical smear collection devices. Of these 34 trials 7 studies dealt with the use of Ayer's spatula and Cytobrush. The percentage of adequate smears ranged from 90.6% to 99.6%.<sup>9</sup>

The number of unsatisfactory smears was 13 (3.25%). Majority of these smears (10 cases, 2.5%) had obscuring inflammation and blood, followed by 2 cases (0.5%) which had less than minimal squamous cell cellularity and were obtained from elderly women and 1 case (0.25%) had a broken slide. The adequate smears depend upon many factors such as squamous cell criteria and glandular cell criteria, obscuring factors like inflammation, blood etc, the choice of the cervical sampling device and last but not the least operator skills.<sup>7</sup> In case of the combination of different cervical sampling devices it was seen that the quality of the Papanicolau smear can be improved by using the Ayer's spatula first, followed by the endo-cervical brush.<sup>10</sup>

The second factor which was in consideration was the convenience of using referral photomicrographs in assessing the squamous cellularity of using referral photo micrographs in assessing the squamous cellularity.

There were many studies after 2001 Bethesda system was introduced, predicting the increase in the unsatisfactory smears as “Satisfactory but limited by ” category present in the earlier 19991 TBS was removed.<sup>11</sup>One study showed a statistically significant increase in the number of unsatisfactory smears using Bethesda 2001. This was mainly due to insufficient squamous cellularity.<sup>12</sup>As study undertaken to determine the reporting rates in various laboratories after implementing Bethesda 2001 did not find an increase in unsatisfactory smears. The squamous cells were counted by one person and then photomicrographs were taken then those referral photographs can be used by other workers. The present study has found this method very convenient since counting individual cells is not required.<sup>6</sup> There are studies are which emphasised on inter observer error.<sup>13and14</sup> Therefore the referral photomicrographs are a convenient method to count the squamous cellularity. This study has shown that the adequacy of cervical smears with Ayer’s spatula and Cytobrush in combination has 96.75% and the plus points of using the referral microphotographs.

## Conclusions

In the present study it was found that the combination of cervical sampling devices i.e. Ayer’s spatula and Cytobrush yield sufficiently adequate smears. The use of referral photomicrographs is a convenient method for assessing squamous cellularity. There were few limitations like use of combination has still to be evaluated in screening camps settings. The cost is another limiting factor in developing countries. The topic of cost effectiveness is dealt with by one worker, who suggested that cost can be reduced by reducing OG-6 in Pap staining procedure.<sup>15</sup> Another study explores the possibility of reduced usage of alcohol which can itself be cost effective<sup>16</sup>

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