ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 4, 2021

**Original Research Article**

# Role of Liquid Based Cytology in Early Detection and Treatment of Cervical Carcinoma

**Dr. Sangeeta Lalwani[1]**

MBBS, DGO, DNB (Assistant Professor Obstetrics and Gynaecology Department, Amaltas Institute of Medical Sciences Dewas, M.P.)[1]

Corresponding Author: Dr. Sangeeta Lalwani

**Abstract**

**Background & Methods:** The aim of the study is to study role of liquid based cytology in early detection and treatment of cervical carcinoma. Study included the use of cervico-vaginal scrape method for collecting the smear. Cervico-vaginal scrape. This is the most efficient single method. The cervical scrape is obtained under direct vision with the vaginal speculum in position

**Results:** Out of 100 patients, in (71%) were in reproductive age group & (23%) were in menopausal age group. The comparison of findings between Conventional Pap smear and Liquid based cytology. (11%) normal smears were found in CPS and (26%) were found in LBC. (74%) inflammatory smears were found in CPS and (72%) were found in LBC.

**Conclusion:** To conclude, in the country where more number of people belong to low socio – economic status, early marriages, higher number of child birth, poor local hygiene are common and with higher incidence of cervical cancer, screening plays an important role in prevention. So awareness should be created about the screening programs and government should take adequate measures to improve the quality of the screening procedures by introducing improved methods like LBC, since cervical cancer is preventable by good awareness, good local hygiene, HPV vaccine, single sexual partner, early detection and timely intervention.

**Keywords:** cytology, detection, cervical & carcinoma.

**Study Design:** Observational Study.

## 1. INTRODUCTION

Cervical Cancer is a cancer arising from the cervix. It is due to the abnormal growth of cells that have the ability to invade or spread to other parts of the body[1]. Early on, typically no symptoms are seen. Later symptoms may include abnormal vaginal bleeding, pelvic pain, or pain during sexual intercourse. While bleeding after sex may not be serious, it may also indicate the presence of cervical cancer.

The normal cervix is covered on its outer surface by a non-keratinizing, stratified squamous epithelium, which is continuous below with the squamous epithelium lining the vagina, and above abuts onto the mucus secreting columnar epithelium lining the endocervical canal and its associated crypts[2]. The junction between the two epithelia normally coincides with the external os, but this is not a constant relation. At puberty, in pregnancy and in some steroid contraceptive users, changes in the size and shape of the cervix result in the squamo-columnar junction (SCJ) being carried out on to the anatomical ectocervix. There are two primary histologic abnormalities accounting for the majority of cervical cancer, squamous cell carcinoma (SCC) and adenocarcinoma[3]. The majority of cervical cancer cases (>70%)

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 4, 2021

are SCC, which is thought to arise from the transformation zone of the cervix. SCC develops from the transformation zone, which locates at the junction between the squamous and columnar cells of the cervix (squamo-columnar junction), which migrates from the exocervix to the distal endocervical canal with advancing age. The second type of cervical cancer is adenocarcinoma, which develops from the mucus-producing cells of the endocervix, accounts for approximately 18 percent of cervical carcinomas and a small number are other types[4].
It is used as an alternative method for Conventional Pap for improving the utility of the cervical specimens and detection. In CP, where the device is discarded, a portion of the sample is lost and slide may contain mucus and blood. In LBC, the sample is collected by a special cytobrush. Representative samples are collected since the tip of the brush is placed into the vial[5]. After removing the blood, mucus and debris, homogenous mixture of the sample is placed on the slide to get a monolayer and stained with PAP. Though the cost of LBC is more, it improves the quality of screening by detecting more epithelial abnormality. In mid-1990's liquid based cytology was introduced and after that many different LBC techniques were in use worldwide. Of these, ThinPrep and SurePath were FDA approved and they were also used for non-gynecologic cytology.

## 2. MATERIAL AND METHODS

Present Study was conducted at AIMS, Dewas for duration of 06 months. Subjects for the proposed study were selected from the patients attending Gynaecology OPD. Informed written consent was taken in the prescribed format from all the participants before collecting samples for the study.
Smears were collected in the Gynaecology OPD and were then transferred to the Cytopathology section for further processing and evaluation. The slides/smears were received in the cytology section Central Diagnostic Laboratory along with request form. After entering all the details in the cytology register the slides were then stained, mounted and labeled for microscopic examination.
Study included the use of cervico-vaginal sample method for collecting the smear. Cervico-vaginal scrape: This is the most efficient single method. The cervical sample is obtained under direct vision with the vaginal speculum in position. The wooden spatula is inserted into the os and the spatula is gently but firmly rotated to 3600C .The cervical mucus and cellular material on the spatula is spread on the glass slides.

**Inclusion criteria:**
1. Cervical cytology samples from all women attending the Gynaecology OPD.
2. The study participants were randomly selected on the basis of complaints like bleeding per vaginum, irregular mensus, pain in lower abdomen, white discharge or any abnormal findings on per speculum examination who were suggested for a Pap test by the gynaecologist and patients of health checkup who came for cervical screening without any symptoms were also included.

**Exclusion criteria:**
1. Non co-operative patients/ Patients who do not give consent.
2. Antenatal patients.
3. Patients with massive bleeding per vagina/ at the time of menstruation.
4. Patients with total hysterectomy.

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 4, 2021

## 3. RESULT

**Table No. 1: Age Distribution**

| Age | No. | Percentage | P Value |
|---|---|---|---|
| **26-35** | 07 | 07 | .020106 |
| **36-45** | 32 | 32 | |
| **46-55** | 25 | 25 | |
| **56-65** | 30 | 30 | |
| **66-75** | 06 | 06 | |

In our study we found maximum cases in age group of 36-45 i.e. 32% followed by 56-65 30%.
The chi-square statistic is 5.4026. The *p*-value is .020106. The result is significant at $p < .05$.

**Table No. 2: Status of menstruation**

| Age | No. | Percentage | P Value |
|---|---|---|---|
| **Reproductive age group** | 41 | 41 | .053642 |
| **Menopausal age group** | 59 | 59 | |
| **Total** | 100 | 100 | |

Out of 100 patients, in (41%) were in reproductive age group & (59%) were in menopausal age group. The chi-square statistic is 4.4141. The *p*-value is .053642. The result is *not* significant at $p < .05$.

**Table No. 3: Distribution of patients with complaints and without complaints**

| Age | No. | Percentage | P Value |
|---|---|---|---|
| **Without Complaints** | 77 | 77 | .047926 |
| **Complaints** | 23 | 23 | |
| **Total** | 100 | 100 | |

Out of 100 patients, in (71%) were in reproductive age group & (23%) were in menopausal age group. The chi-square statistic is 0.3074. The *p*-value is .047926. The result is significant at $p < .05$.

**Table No. 4: Comparison of results on CPS and LBC**

| | CPS | | LBC | | P Value |
|---|---|---|---|---|---|
| **Age** | **No.** | **Percentage** | **No.** | **Percentage** | |
| **NILM** | 11 | 11 | 26 | 26 | .022441 |
| **Inflammatory smear** | 74 | 74 | 72 | 72 | |
| **Epithelial cell abnormality- Squamous** | - | - | - | - | |
| **ASCUS** | 03 | 03 | 01 | 01 | .045291 |
| **HSIL** | 01 | 01 | 01 | 01 | |
| **Epithelial cell abnormality- AGC** | 01 | 01 | 00 | 00 | |

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 4, 2021

The comparison of findings between Conventional Pap smear and Liquid based cytology. (11%) normal smears were found in CPS and (26%) were found in LBC. (74%) inflammatory smears were found in CPS and (72%) were found in LBC. The chi-square statistic is 5.2113. The *p*-value is .022441. The result is significant at $p < .05$. The chi-square statistic is 0.375. The *p*-value is .045291. The result is significant at $p < .05$.

## 4. DISCUSSION

The primary objective of the study was to compare the performance of conventional Pap smear with liquid based cytology (ThinPrep). Cervical samples were compared for multiple parameters like unsatisfactory rates, diagnostic difference between both the methods etc.
Accordinh to Abulafia et al[6], an interpretation of ASCUS is more frequent with CPS although no significant difference is seen in LSIL/HSIL detection. The possible reason for a lesser number of ASCUS in some of the studies is perhaps because the cells, which appear normal on LBC, may appear abnormal with CPS. Generally, most studies claim LBC to be superior to CPS in identifying LSIL and HSIL. According to these authors, the frequency of interpretation of ASCUS is low with LBC. Study group was small and so probably larger study group is required for a definite opinion.
The percentage of background inflammation significantly reduced with LBC compared to CPS with P value (< 0.001). This is in concordance with the study of Costa (2015) [7] and Sharma et al (2016) [8], they also observed reduction of background inflammation with LBC. The degree of inflammation is one grade lower in LBC as on a conventional smear. This is because of the filter used as in case of ThinPrep. The background was clearer and showed lesser inflammation due to the removal of the obscuring materials like blood and mucus during the processing of the sample. Despite this, inflammation was usually not missed out in LBC because as reported by other authors, neutrophils are clearly visualized on LBC although their number is reduced.
ASCUS was reported in (3%) cases in CPS while it was found to be present in only (1%) case by LBC technique with a P-value < 0.001 which is significant. The lower detection rate of ASCUS on LBC as compared to CPS may be attributed to better staining and no air drying artefacts in LBC technique which reduces the false positive rates. The results of ASCUS in this study shows concordance with the study of Hawaldar et al[9] with ASCUS reported in 10 (3.31%) patients by CPS while it was found to be present in only 6 (2%) patients by LBC technique. This study shows results similar to that of Jie Zhu et al[10] but contrast to studies which showed that LBC was a better test for diagnosis of ASC.

## 5. CONCLUSION

To conclude, in the country where more number of people belong to low socio – economic status, early marriages, higher number of child birth, poor local hygiene are common and with higher incidence of cervical cancer, screening plays an important role in prevention. So awareness should be created about the screening programs and government should take adequate measures to improve the quality of the screening procedures by introducing improved methods like LBC, since cervical cancer is preventable by good awareness, good local hygiene, HPV vaccine, single sexual partner, early detection and timely intervention.

## 6. REFERENCES

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 4, 2021

1. Wright TC Jr, Schiffman M, Solomon D, Cox JT, Garcia F, Goldie S, et al. Interim guidance for the use of human papillomavirus DNA testing as an adjunct to cervical cytology for screening. Obstet Gynecol 2004; 103: 304-9.
2. Arbyn M, Bergeron C, Klinkhamer P, Martin-Hirsch P, Siebers AG, Bulten J. Liquid compared with conventional cervical cytology: A systematic review and meta-analysis. Obstet Gynecol 2008; 111:167-77.
3. Liquid based cervical cytologic smear study and conventional Papanicolaou smear – A metaanalysis of prospective studies comparing cytologic diagnosis and sample adequacy. Sara J Bernstein Am J Obstet Gynecol Vol 185, Number 2,308-17.
4. Tristram, A., & Fiander, A. (2007). Human papillomavirus (including vaccines). Obstetrics, Gynaecology & Reproductive Medicine, 17(11), 324- 329.
5. Hatch KD. Multi-site clinical outcome trial evaluate performance of the ThinPrep test. Obstet Gynecol 2000;95(4, Suppl.1):S51.
6. Abulafia O,Pezzullo JC,Sherer DM. Performance of Thin Prep Liquid based cervical cytology in comparison with Conventionally prepared Papanicolaou smears. A quantitative survey. Gynecol Oncol 2003. 90: 13-144.
7. Costa MO. Comparison of conventional Papanicolaou cytology samples with liquid-based cervical cytology samples from women in Pernambuco, Brazil. Braz J Med Biol Res 2015; 48:831-8.
8. Sharma J, Toi PC, Siddaraju N, Sundareshan M, Habeebullah S. A comparative analysis of conventional and SurePath liquid-based cervicovaginal cytology: A study of 140 cases. J Cytol 2016; 33:80-4.
9. Hawaldar R, Sodani S. Comparison of conventional pap smear versus liquid based cytology in a diagnostic centre of central Madhya Pradesh. Indian Journal of Pathology and Oncology 2016 Jan - Mar; 3(1):42-47.
10. Jie Zhu et al. A comparison of liquid-based cytology and Pap smears a screening method for cervical cancer oncology reports 18: 157-160, 2007.