

A Study on Cervical Pap Smears by Liquid Based Cytology and Conventional Method: In a Tertiary Care Hospital

Dr. Siva Ranjan D¹, Dr. Majety Dora venkata Ramnath²,

Professor, Department of Pathology, Nimra Institute of Medical Sciences.

Assistant Professor, Department of Pathology, Nimra Institute of Medical Sciences..

Abstract:

Cervical Pap smear is a screening procedure which is used to identify the lesions in cervix such as precancerous lesions and also which was helpful in prevention of subsequent invasive cervical carcinoma. Worldwide among females, cervical carcinoma is the second most common cancer. The Liquid Based Cytology is the technique which is developed to screen cervical pap smears as an alternative to Conventional Pap Smear; now a days the reason to choose liquid based cytology is that it reduces the artifacts and the screening time when compared to conventional method. The study was done on 72 patients who attended gynecology outpatient department presenting with gynecological complaints to compare Conventional pap smear with liquid-based methods, and also to assess the results and feasibility of Liquid based cytology over Conventional Pap Smear in our tertiary care hospital settings. In our results it was observed in liquid based cytology there was increased rate of detection of precancerous lesions because of a clean background on the smear. Simultaneously it also provided residual cellular material which is necessary for molecular testing.

Key words: Cervical Pap smear, Cervical Carcinoma, Cervical Cytology, Liquid Based Cytology.

Date of Submission: 07-01-2024

Date of Acceptance: 17-01-2024

I. Introduction:

Among Worldwide, the second most common cancer among women is cervical cancer with an annual average of four lakh ninety three thousand new cases and average deaths of two lakh seventy four thousand occurring every year.[1] Many years before cervical screening programs were introduced worldwide; before patients present with cervical invasive carcinoma, they were screened and detected the cellular changes in the cervix and even the intraepithelial lesions.[2] The cervical smears was stained by Papanicolaou (PAP) stain. The introduction of Papanicolaou (PAP) stain by Dr. Papanicolaou and traub made it possible.[3] Using this PAP stain cervical screening was done by conventional scrape smears, this showed a tremendous reduction in the incidence of invasive cervical carcinoma.[4] but the conventional pap smears (CPS) has sampling errors like in preparing the smear, inadequate sample, presence of artifacts on smears and obscuring materials like blood and mucus which led to false negative results.[5]

Pap smear collection from the portio vaginalis of the cervix and the endocervical canal is done by using a cervical spatula and endocervical brush, This is the standard technique. Recently Liquid Based Cytology (LBC) technique has been developed which gained lot of positive points and popularity in reducing the sampling errors like inadequate sampling, artifacts, obscuring materials like blood and mucus and even false negative and false positive results when compared to CPS technique. In CPS method only approximately 20% of harvested cells are transferred on the slide which is leading to the sensitivity reduction of the test and Mean sensitivity of only 55-60% [6]. Finally the present study was undertaken and the aim of the study is to evaluate and compare the results of conventional pap smears and liquid based cytology preparation for cervical cancer screening.

II. Materials & Methods:

This prospective study was conducted in the Department of Pathology and Department of gynecology for a period of six months in a tertiary care hospital. Patient attending OPD in gynecology department with complaints like vaginal discharge, lower abdominal pain, abnormal vaginal bleeding and post coital bleeding were examined, after detail history taking and with informed consent PAP smear samples were collected done from 72 patients.

The samples were taken by Ayers spatula and also by using endocervical brush. The sample collected by Ayers spatula were smeared on to the slide and fixed in alcohol. After completion of fixation the smears were

stained by using PAP stain. The samples collected by endocervical brush were processed by detaching the brush into a vial containing fixative and the vial is transported to the lab. In the lab sample collected by endocervical brush was centrifuged at 1500 RPM for 10 minutes. The supernatant obtained was discarded and direct smears were prepared from cell button and again fixed in fixative. After completion of fixation the smears were stained with PAP stain. Now both the smears made by CPS and LBC were reported according to the new Bethesda system.

III. Results:

The study was done on 72 patients who attended the outpatient department in the department of gynecology at tertiary care hospital. Out of 72 Patients the most common presenting chief complaint was leucorrhoea or persistent vaginal bleeding seen in 52 (72.3%) patients shown in Table 1. Clinically the most common per speculum finding was cervical erosion, the finding by per speculum was shown in Table 2. In cytological diagnosis the majority of the cases are normal and four cases diagnosed as carcinoma of cervix, the case wise distribution of diagnosis and comparison between CPS and LBC is given in Table 3. Table 4 shows the age wise distribution of cases.

Table 1 shows the chief complaints of patients indicated for PAP smear collection.

S.No	Chief complaint	Number of patients	percentage
1	Leucorrhoea	52	72.3 %
2	Irregular bleeding	27	37.5%
3	Lower abdominal pain	50	69.5 %
4	Post coital bleeding	7	9.7%

Table 2: Showing distribution of cases according to per speculum findings

S.No	Per speculum findings	Number of cases	percentage
1	Cervical erosion	45	62.5%
2	Cervical hypertrophy	16	22.3%
3	Cervical growth	5	6.9 %
4	Procedentia	6	8.3 %

Table 3: Showing comparison of diagnosis between CPS and LBC

S. No	Diagnosis	Liquid based cytology		Conventional pap smear	
		Number of patients	percentage	Number of patients	percentage
1	Normal	43	59.7 %	47	65.4 %
2	LSIL	14	19.5 %	12	16.6 %
3	HSIL	11	15.3 %	9	12.5 %
4	Carcinoma of cervix	4	5.5 %	4	5.5 %

Table 4: Showing Age wise distribution of cases diagnosed on LBC

S.No	Age	Normal	LSIL	HSIL	Carcinoma of cervix
1	20-30 years	37	2	0	0
2	31-40 years	3	3	2	0
3	41-50 years	1	3	7	2
4	>	2	6	2	2

IV. Discussion:

This is a prospective study done on 72 patients to compare conventional pap smear (CPS) and liquid based cytology (LBC) in screening carcinoma of cervix. LBC is a new technique which makes the cells to be suspended in a monolayered sheet. This improves the detection of abnormal cells or lesions very easily; only the disadvantage of LBC is that, it is more expensive technique.

In the present study the most common chief complaint given by patients was leucorrhoea or persistent vaginal bleeding in 52 (72.3%) patients. This was found similarly in another prospective study done by Sherwani et al[7]. However, the complaint of lower abdominal pain was given by most of the patients having leucorrhoea or persistent vaginal bleeding, similar findings was observed by Afsan et al[8]. One more study stated that patient presented with complaint of white discharge showed dysplastic changes, when those patients

smear studied microscopically in a few cases[9]. Similarly our study found dysplastic changes in three cases who presented with history of leucorrhoea.

Sulochana et al.[10] in their study they found in smears that the background was hemorrhagic and mucin, markedly seen in CPS when compared to LBC. Similarly in our present study the percentage of hemorrhagic background significantly reduced in LBC compared to CPS. We also observed that endocervical cells were present in 54% cases in CPS while in LBC it was 18 % only. Kirschner et al [11] also observed similar difference in endocervical cells detection in between CPS and LBC.

The comparative study between CPS and LBC smears showed 14 (19.5%) cases had low-grade squamous intraepithelial lesions (LSIL) on LBC and 12 (16.6%) cases on conventional pap smear, this indicates that LBC was superior to conventional pap smear to detect LSIL. LBC had 3 % more positivity to detect LSIL than CPS. Regarding High-grade squamous intraepithelial lesions (HSIL) 11(15.3%) cases has HSIL on LBC when compared to 9(12.5%) cases had HSIL on conventional pap smear. So, that LBC was also superior to detect HSIL. LBC had 3 % more positivity to detect HSIL than CPS. In case of diagnosing squamous cell carcinoma of cervix both CPS and LBC detected 4 (5.5%) cases. These four cases were detected on CPS as well as on LBC. Similarly J Monsonego et al [12] study showed detection of LSIL and HSIL was more in LBC when compared with convention pap smears.

Age wise distribution of cases in the present study showed that maximum number of abnormal cases was seen between 41 to 50 years, maximum HSIL cases and two cases of invasive carcinoma are seen in this age group. 43 cases were diagnosed as normal in LBC and these maximum numbers of normal cases were seen in younger age group that is between 20 to 30 years and only two cases of LSIL were found in this age group.

V. Conclusion:

In our settings like tertiary care hospital LBC is considered as high cost test for our rural population, but if feasible LBC can be used instead of CPS because it increases the rate of detecting abnormal cells with clean background. To conclude, in the present study low-grade squamous intraepithelial lesions (LSIL) cases and High-grade squamous intraepithelial lesions (HSIL) cases were detected more on LBC smears.

References:

- [1]. Ferlay J, Parkin Dm, Pisani P., Globolan 2002 : Cancer Incidence, Mortality And Prevalence Worldwide Version 1.0 Iarc Cancer Base No. 5, Lyon : Iarc Press, 2005.
- [2]. Kavatkar An, Nagwanshi Ca, Dabak Sm. Study Of A Manual Method Of Liquid-Based Cervical Cytology. Indian J Pathol Microbiol 2008;51:190-4.
- [3]. Naylor B. The Century For Cytopathology. Acta Cytol 2000;44:709-25.
- [4]. Gustaffson L, Ponten J, Zack M, Adami Ho. International Incidence Rates Of Invasive Cervical Cancer After Introduction Of Cytological Screening. Cancer Causes Control 1997;8:755-63.
- [5]. Abulafia O, Pezzullo Jc, Sherer Dm. Performance Of Thinprep Liquid Based Cytology In Comparison With Conventionally Prepared Papanicolaou Smears: A Quantitative Survey. Gynecol Oncol 2003;90:137-44.
- [6]. Apgar Bs. New Tests For Cervical Cancer Screening. Am Fam Physician 2001;64: 729-31.
- [7]. Sherwani Rk*, Khan T Et Al. Conventional Pap Smear And Liquid Based Cytology For Cervical Cancer Screening – A Comparative Study Journal Of Cytology 2007; 24 (4):167-172.
- [8]. Afsan N, Akhtar K, Khan T, Rahman K, Sherwani Rk, Siddiqui Fa, Et Al. Conventional Pap Smear And Liquid Based Cytology For Cervical Cancer Screening - A Comparative Study. J Cytol 2007;24:167-72.
- [9]. Kenneth Dh, Fu Ys. Cervical And Vaginal Cancer. In: Novak's Textbook Of Obstetric And Gynaecology. 13th Ed. Baltimore: Wb Saunders Co.; 2002. P. 471-93.
- [10]. Sulochana S, Gopalan D, Srinivasan C. Liquid Based Cytology-Is It A Good Alternative? Int J Cur Res Rev 2014;6:19-27.
- [11]. Kirschner B, Simonsen K, Junge J. Comparison Of Conventional Papanicolaou Smear And Surepath Liquid-Based Cytology In The Copenhagen Population Screening Programme For Cervical Cancer. Cytopathology 2006;17:187-94.
- [12]. J Monsonego, A Autillo – Touati, C Bergeron, R Dachez, J Liaras, J Saurel, L Zerati, P Chatelain And C Mottot Liquidbased Cytology For Primary Cervical Cancer Screening : A Multi-Centre Study British Journal Of Cancer (2001) 84(3), 360-366.