



Original Research Article

A retrospective study of pap smear and cervical biopsy correlation in abnormal cervical cytology cases

Dinesh Kumar S¹, K Rajeswari^{1,*}, Ramya Krishna¹, Meenakshisundaram K¹

¹Dept. of Pathology, ESIC Medical College & PGIMS, Chennai, Tamil Nadu, India



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ABSTRACT

Introduction: Cancer cervix is a global health problem and Pap smear is an important screening tool, which has proven to be highly effective in reducing the number of cases and the mortality from cervical carcinoma. Any abnormality detected in Pap smear has to be confirmed with cervical biopsy, which is the gold standard for diagnosing the lesions of the cervix.

Objectives: To study the prevalence of abnormal cervical cytology cases detected by Pap smear testing in our setting, to find the distribution of cytologically abnormal cases and also the concordance and discordance between Pap smear and cervix biopsy in cytologically abnormal cases to assess the sensitivity of Pap smear in detecting the intraepithelial lesions / malignancy of cervix.

Materials and Methods: The study included all the abnormal cervical cytology cases and their cervix biopsies, for five years. The cytologically abnormal cases were listed and a thorough search was made for their cervix biopsy. The histopathological diagnosis of the corresponding cervix biopsies (if done) were also listed and compared for concordance.

Results: There were totally 12600 cases of Pap smear done during the study period and there were 146 cytologically abnormal cases. Histopathology reports of the cervix biopsy were available for 44 cases. Out of the 44 cases, 40 cases were concordant. The sensitivity of Pap smear test in our setting was found to be 90.9%.

Conclusion: Our study revealed a good correlation between Pap smear and cervix biopsy.

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1. Introduction

Cancer cervix is the most common cancer in Indian women and also a common cause of cancer related deaths, especially in developing countries like India. The incidence of cervical cancer worldwide is approximately 510,000 new cases with approximately 288,000 deaths. The incidence of the disease rises in 30 – 34 years and peaks at 55 – 65 years with a median age of 38 years.¹ The lighter side of this disease is that the invasive stage is preceded by non-invasive phases and all the phases can be picked up and diagnosed by Pap smear. Pap smear being a simple, non-invasive and inexpensive test remains a very effective screening tool for cancer cervix and can detect over 90%

of cytological abnormalities. The standard protocol that is followed across the globe regarding management of patients with abnormal Pap smear results is to proceed with cervical biopsy for confirmation. The concordance of Pap smear with cervical biopsy is highly variable, ranging between 40 – 95% among the pathologists due to many reasons like regression of the lesion, sampling error or analytical error which could again be due to multiple reasons.² study of cytohistopathology correlation will help in identifying the extent of concordance between Pap smear and cervix biopsy and hence will aid in establishing the sensitivity of Pap smear study in our setting. Such study on cytohistopathology correlation can also be taken as a part of quality assurance of cytology laboratory.

* Corresponding author.

E-mail address: drkraj@yaho.co.in (K. Rajeswari).

2. Objectives

1. To study the prevalence of abnormal cervical cytology cases detected by Pap smear testing
2. To study the distribution of cytologically abnormal categories among our patients
3. To study the concordance and discordance between Pap smear and cervix biopsy
4. To estimate the sensitivity of Pap smear in the early detection of lesions of the cervix in our setting.

3. Materials and Methods

This is a retrospective study done to include all the Pap smears reported between 1.1.2015 and 31.12.2019 in our department. The cytologically abnormal cases that included ASCUS (Atypical Squamous Cells of Undetermined Significance), AGUS (Atypical Glandular cells of Undetermined Significance), LSIL (Low grade Squamous Intraepithelial Lesion), HSIL (High grade Squamous Intraepithelial Lesion), ASC-H (Atypical Squamous cells, cannot exclude HSIL) and squamous cell carcinoma were listed separately including their age at the time of presentation. Cervix biopsy, if done for the cytologically abnormal cases were also listed separately. The reports of cytology and histopathology were compared and the extent of concordance and discordance were measured. The sensitivity of the Pap smear test in the detection of cervical abnormalities were measured for our setting.

3.1. Inclusion criteria

Women aged 21 – 80 years were included irrespective of their marital and parity status.

3.2. Exclusion criteria

Known cases of carcinoma cervix, treated cases of carcinoma cervix were excluded from the study.

4. Results

Details of the cytological and histopathological diagnosis were tabulated and statistically analysed. Sensitivity was calculated considering histopathological diagnosis of cervical biopsy as the gold standard.

During the above mentioned five-year study period there were totally 12600 patients who underwent Pap smear as a part of routine health check and also for related symptoms. Out of the total cases, 146 were cytologically abnormal and their distribution according to the year is given in Table 1.

The age wise distribution of cytologically abnormal Pap smears is given in Table 2. Most patients were in the fifth decade and the least common were in the third and eighth decades.

Table 3 depicts the different categories of cytological abnormalities along with the histopathological diagnosis.

The most common epithelial abnormality detected cytologically was ASCUS (45.9%) which was closely followed by HSIL (43.1%) and the least common was ASC-H (0.7%). Out of the 146 cytologically abnormal cases, corresponding cervix biopsy was done in 44 cases and their cyto histo correlation and concordance are listed in the same table.

The most common histopathological diagnosis of ASCUS was chronic cervicitis and the other findings were mild and moderate dysplasia. There was only one case of ASC- H which turned out to be squamous cell carcinoma in cervix biopsy. There were 9 cases of LSIL for which biopsy was done for 3 cases which were reported as mild dysplasia in 1 case and chronic cervicitis in the remaining 2 cases. There were 63 cases of HSIL diagnosed by Pap smear, out of which 20 underwent biopsy and except two cases which were reported as chronic cervicitis all the others were reported as mild, moderate and severe dysplasia, carcinoma insitu and squamous cell carcinoma. There were 4 cases of squamous cell carcinoma diagnosed with Pap smear and only one patient underwent cervix biopsy which turned out to be squamous cell carcinoma. There were only 2 cases of AGUS for which cervix biopsy was not done.

The cytopathology histopathology correlation observed in our study was 90.9% (40/44 cases).

Table 1: Year wise distribution of total Pap smears and cytologically abnormal Pap smears

Year	No of Pap smears	Abnormal Pap smears
2015	2361	19
2016	2421	31
2017	2211	26
2018	2636	35
2019	2971	35
Total	12600	146

Table 2: Age wise distribution of patients with cytological abnormalities in Pap smear

Age Group	No. of Abnormal Pap smears	%
20-29	4	2.7
30-39	35	24.0
40-49	62	42.5
50-59	22	15.1
60-69	19	13.0
70-79	4	2.7
Total	146	100

5. Discussion

Carcinoma cervix has a very long premalignant latent phase that precedes the invasive stage and can be detected by cytological examination of cervical smears.³

In our study, most patients were in the fifth decade(42.5%) which is comparable to studies done

Table 3: Cyto histological correlation of cytologically abnormal cases

Cytology	Total cases	Prevalence	Biopsy done	Biopsy correlation	Concordance (%)
ASCUS	67 (45.9%)	0.53 %	19	4 – Mild dysplasia 1 – Moderate dysplasia 14 – Chronic cervicitis	19/19 (100%)
ASC - H	1 (0.7%)	0.008 %	1	SCC*	1/1 (100%)
LSIL	9 (6.2%)	0.07 %	3	1 – Mild dysplasia 2 – Chronic cervicitis	1/3 (33.3%)
HSIL	63 (43.1%)	0.5 %	20	6 – CIN 2 – Mild dysplasia 3 – Moderate dysplasia 3 – severe dysplasia 4 – SCC* 2 – Chronic cervicitis	18/20 (90%)
SCC	4 (2.7%)	0.03 %	1	SCC	1/1 (100%)
AGUS	2 (1.4%)	0.02 %	0	-	-
Total	146 (100%)		44		40/44 (90.9%)

SCC– Squamous cell carcinoma

Table 4: Comparison of present study with similar studies

Study	Year	Sensitivity (%)
Present Study	2021	90.90
Atla et al	2015	94.11
Goyal et al	2015	86
Bamanikar et al	2016	89.47
Alakananadha et al	2016	91.5
Chaudhary et al	2014	79.37
Dhakal et al	2016	77.80
SimridhiBindroo et al	2019	75.24

Table 5: Comparison of epithelial cell abnormalities with other studies

Study	Total number of patients	ASCUS (%)	LSIL (%)	HSIL (%)	SCC (%)
Present study	12600	0.53	0.07	0.5	0.03
George an Rao	1000	0.3	2.0	0.9	0.3
Gupta et al	4703	0.52	1.36	0.91	0.28
Sengul et al	1032	1.18	0.39	1	0.02
Nair et al	2028	0.15	1.58	0.49	0.2
Kothari et al	36740	0.11	0.83	0.31	0.05
Nayir et al	1032	1.7	0.5	0.16	-

by Joshi et a (50%) and Parija et al (37.15%).⁴

In our study, the prevalence of cervical epithelial abnormalities was only 1.12% (146/12600) detected by cytological examination of Pap smears, which is similar to study by Kothari et al as shown in Table 5.^{5,6} 30% (44/146) underwent cervix biopsy following epithelial cell abnormalities.

In our study, all the cases of ASCUS correlated with histopathology. We included the cases which were diagnosed as chronic cervicitis in cervix biopsy as concordant considering the possibility of severe form of chronic cervicitis with or without squamous metaplasia with inflammatory atypia being picked up as ASCUS. The results were comparable with similar studies by Alakananda et al as

shown in Table 4.⁷

There was only one case of ASC- H which turned out to be squamous cell carcinoma in cervix biopsy and hence concordant.

Cytological diagnosis of LSIL was given in 9 cases out of which biopsy was available for 3 cases and the diagnosis was mild dysplasia in 1 case. The concordance rate is 33.3% as the remaining 2 cases turned out to be chronic cervicitis.

20 cervix biopsies were received out of 63 cases diagnosed as HSIL.18 cases showed dysplastic changes including 4 cases of squamous cell carcinoma. The two discordant cases were reported as chronic cervicitis with extensive squamous metaplasia in cervix biopsy. Hence, the concordance rate with HSIL is 90% (18/20 cases). The

results are similar to the study done by Atla et al (99%).⁸

The concordance rate for malignant squamous lesion diagnosed on cytology is 100% with histopathology.

There were only 2 cases of AGUS for which cervix biopsy was not done.

The cytopathology histopathology correlation observed in our study was 90.9% (40/44 cases) which was comparable to Atla et al (83.33%), Patil et al (82.1%) and Joshi et al (80.0%) (Table 4).^{9,10} This study shows a good correlation between Pap smear and cervical histology.

6. Conclusion

Pap smear testing is a very useful, simple, economical and safe tool for early detection of premalignant and malignant cervical lesions. Our study observed that cervical cytology is a sensitive test in diagnosing cervical neoplasia. The cytological and histopathological findings were significantly correlated in the epithelial lesions of the cervix and such correlation studies are important tools that can be used in the quality assurance of cytology laboratories. Every attempt must be done to prevent errors in the reporting of Pap smears to improve its sensitivity and usefulness.

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8. Conflict of Interest

The authors declare they have no conflict of interest.

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Author biography

Dinesh Kumar S, Assistant Professor

K Rajeswari, Associate Professor

Ramya Krishna, Tutor

Meenakshisundaram K, Professor and HOD

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