IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES
ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 10,Oct 2022

Diagnostic Accuracy of Conventional Pap Smear Cytology and Colposcopic Directed Biopsy in Detecting Premalignant and Malignant Lesions

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ABSTRACT

Background: Diagnosis of cervical lesions has become very important to reduce morbidity and mortality related to cervical cancer. In most developed countries, screening programmes for early detection of preclinical cervical cancer has proven to be very useful and have contributed to improved results of treatment. The lack of understanding of cervical cancer among people and policy makers contributes to the burden of cervical cancer on India's health system. Cervical cancer is easily preventable by detecting early lesions and initiating appropriate programs to treat them.

Aim and Objective: To detect premalignant and malignant lesions with traditional Pap smear cytology plus colposcopic guided biopsies has high diagnostic accuracy.

Methodology: This study was carried out at Santosh Medical College and Hospital, Ghaziabad, U.P in the Department of Pathology and Obstetrics and Gynaecology during a period of one and half year. We took a total of 200 patients presenting with clinical symptomatology in the Obstetrics and Gynaecology department and performed Pap smear on all 200 cases.

Result: There were 52(26%) patients turned out to be normal on Pap smear and 148(74%) cases were found to be abnormal. Out of these abnormal cases 42(21%) cases appeared either Dysplastic or Neoplastic on Pap smear.

Conclusion: The Pap smears sensitivity was 76.2%, but its specificity was a magnificent 100%. PAP smear cytology has a diagnostic accuracy of 88.3%.

Keywords: Cervical cancer**,** Pap smear test, malignant lesions, colposcopy, biopsy

1. INTRODUCTION

Cervical cancer is the most common malignant tumor of the female genital tract in most countries and is a significant cause of death in women.[1] India accounts for one-fifth of the world's burden. [2] It is the first most frequent cancer among women between 15 and 44 years of age in India.

This tumor often appears in the older age group but also occurs with increased relative frequency in young white females. Evidence exists supporting the association of early marriage, multiparity, and low socio economic levels with a high incidence of cervical cancer. The single most important factor is age at first intercourse. [1] This tumor has a low

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incidence in Jewish women and is non existent in nuns. Current estimates indicate that every year 134420 women are diagnosed with cervical cancer and 72825 die from the disease. [3] Early diagnosis of cervical cancer is very important to reduce morbidity and mortality related to cervical cancer. In most developed countries, screening programmes for early detection of preclinical cervical cancer has proven to be very useful and have contributed to improved results of treatment. These days allot of health awareness programmes about screening and prevention of cervical cancer are being conducted.

The Papanicolauo test (PAP smear), Non colposcopic directed biopsy and Colposcopic directed biopsy are three main test available to detect cervical cancer. Exfoliative cytology (Pap test) is the standard screening tests for pre-invasive lesions of cervix. It was introduced by Papanicolaou in 1943. Pap test detects abnormal cellular changes associated with cervical lesions. It is the cornerstone of women's preventive healthcare. Although cytology based Pap test is the universal cervical cancer screening method and has been shown to be effective in reducing more than 70% cervical cancer incidence in US. In this test tissue from the cervix is obtained during a routine pelvic examination and microscopically examined after staining, [4] though the use of Pap smear has resulted in dramatic decline in the mortality and morbidity rate of cervical cancer, but has also resulted in unrealistic community expectations. In reality the sensitivity of Pap smear for high grade CIN is only 70-80% [5,6] so to improve the detection of cervical lesions using the Pap smear in screening, a number of adjunct procedures have been developed.[5]

Here we need a list which is highly sensitive and specific as [4] the sensitivity of Pap smear is not 100%, we have to look for other options, this is where we opt for Biopsy or Colposcopic directed Biopsy. The use of colposcopy has not only permitted accurate identification of lesions but also allowed for the use of ablative procedures which resulted in fewer unnecessary morbid surgical procedures.[5] Colposcopy evaluates changes in terminal vascular network that reflects biochemical and metabolic changes in tissue that are earliest changes in development of cervical cancer. Cytological examination is a laboratory technique whereas Colposcopy is a clinical method and each evaluates a different aspect of neoplasia.[7]

Thus determining which women with positive tests are at high risk for significant cervical disease, performing appropriate diagnostic workup, and treating cancer precursors presents a major public health challenge. So keeping all these points in mind there is a need to diagnose cervical cancer as early as possible and with a better test.

2. METHODS AND MATERIALS

This prospective study was conducted in females who fulfilled the inclusion criteria in the department of gynecology of Santosh Medical College and Hospital Ghaziabad, U.P. Detailed clinical history, physical examination and routine investigations were done in all the study patients. They were included in the study after taking informed consent.
Cases were evaluated according to their presentation and Pap smear samples were taken followed by colposcopic directed biopsy in relevant cases. A Total of 200 patients were taken in our study and 38 patients further underwent colposcopic directed biopsy, and results of cytological diagnosis were compared with histological diagnosis.

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 10,Oct 2022

3. RESULTS

Table:1 Age group distribution of the patients in study group

Age-group (years)	No. of patients	Percentage (%)
20-30	48	24
31-40	95	47.5
41-50	47	23.5
≥51	10	5
TOTAL	200	100

Out of total 200 patients in the study populationhighest (47.5%) wasfrom31-40 age group and lowest (5%) in ≥51 years age group. All thepatients went for PAP smear, out of these, in 38 patients colposcopicdirectedbiopsywasdone.(**Table1,fig1**)

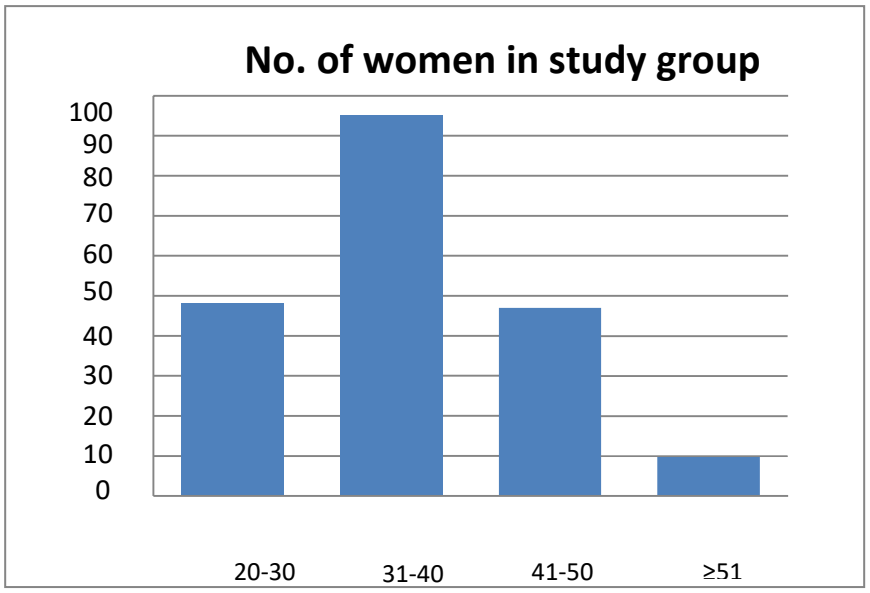

Fig: 1 Age group distribution

Table 2: Distribution of commonly presenting symptoms according to lesion (Cytology) type, N=200

Symptoms	Normal	Inflammatory	Atrophic	Unsatisfactory		LSIL	HSIL	SCC
Discharge per vaginum	21	49	1	2	2	23	9	1
Menstrual disturbances	16	22	-	-	1	9	3	-
Post coital bleeding	3	4	-	-	-	-	-	-

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Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 10,Oct 2022

Post menopausal bleeding	-	2	-	-	-	-	-	-
Pain abdomen	10	17	-	-	1	6	1	1
Dyspareunia	1	1	-	-	-	-	-	-

This table shows that in cases of Inflammatory smear, 49 cases had discharge per vaginum, 22 cases had menstrual disturbances, 17 had pain abdomen. In LSIL 23 patients had discharge per vaginum, 9 had menstrual disturbances,6 had pain abdomen, In HSIL 9 patients had discharge per vaginum, 3 had menstrual disturbances,1 had pain abdomen. In SCCI patient had discharge per vaginum,1patient had pain abdomen. (**Table 2**)

Table 3: Distribution of commonly presenting symptoms according to lesion (Histopathology) type N=38

Symptoms	Chronic Cervicitis	LSIL	HSIL	SCC
Discharge per vaginum	14	2	9	1
Menstrual disturbances	6	2	3	-
Postcoital bleeding	-	-	-	-
Postmenopausal bleeding	-	-	-	-
Pain abdomen	4	2	1	1
Dyspareunia	-	-	-	-

This table shows that in cases of Chronic cervicitis, 14 cases had discharge pervaginum,6 cases had menstrual disturbances, 4 had pain abdomen. In LSIL 2 patients had discharge per vaginum, 2 had menstrual disturbances, 2 had pain abdomen, In HSIL 9 patients had discharge per vaginum, 3 had menstrual disturbances, 1 had pain abdomen, In SCC 1 patient had discharge per vaginum,1 patient had pain abdomen.(**Table 3**)

Table 4: Correlations between Pap smear cytology and histopathology

PAPSMEAR	RESULT	BIOPSY	RESULT
Normal (Clinicallysuspicious)*	3	Chronic Cervicitis	2
		LSIL	1
Persistent Inflammatory Smear	22	Chronic Cervicitis	18
		LSIL	3
		HSIL	1
ASCUS	2	Chronic Cervicitis	2
HSIL	10	HSIL	10
SCC	1	SCC	1

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Total	38		38

Although the cervix was reported as Normal smear, it cervix appeared Unhealthy/Suspicious on P/S so due to the non compliance of patients, Colposcopy and Colposcopic directed Biopsy was done in these 3 patient.(**Table9)**

Table5: Comparison between cytological and histological diagnosis

Cytology (papsmears)	Histopatholoy(cervicalbiopsy)		Total
	Neoplastic	Non-neoplastic	
Non-neoplastic	22	5	27
Neoplastic	0	11	11
Total	22	1 6	38

As we shown in table 5, the non-neoplastic includes all normal, infective, inflammatory, ASCUS cases and Neoplastic includes all dysplastic and frank malignancy cases. 86.84% was the percent of agreement between cytological and histological diagnosis.

Table 6: Sensitivity between cytological and histological diagnosis

Statistic	**Value**	**95% CI**
Sensitivity	100.00%	84.56% to 100.00%
Specificity	68.75%	41.34% to 88.98%
Positive Likelihood Ratio	3.20	1.55 to 6.62
Negative Likelihood Ratio	0.00	
Disease prevalence (*)	57.89%	40.82% to 73.69%
Positive Predictive Value (*)	81.48%	68.02% to 90.10%
Negative Predictive Value (*)	100.00%	
Accuracy (*)	86.84%	71.91% to 5.59%

(*) These values are dependent on disease prevalence Value

4. DISCUSSION

A Total of 200 patients with clinical symptomatology were taken in our study during a period of one and half year (November 2011-July 2013). All the 200 cases underwent Pap smear evaluation for definite dysplastic or invasive malignant lesions and only the relevant cases underwent further Colposcopy and Colposcopic directed Biopsy. 38(19%) patients underwent colposcopy and colposcopic directed biopsy, remaining 162 (81%) patients did not need colposcopy. (Table 2) In 10 cases PAP smear proved HSIL, cone biopsy was performed and correlated well with cytomorphology and histology, cone biopsy taken to prove or disprove the kind of lesion, All proved to be HSIL.A study done by Stovall, Thomas G, Frank

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W,McCord, Marian L, Summitt, Robert L, Jr (1991) on 65 females to study the discrepancy of cervical cytology and colposcopic biopsy, and it was concluded that cervical conization should be performed in patients with discrepancies in results from the PAP smear and colposcopic biopsy.[5] Finally in our study we have seen that the Diagnostic accuracy of Pap smear cytology is 88.3%, this shows that Pap smear itself is an excellent screening program in diagnosing cervical lesions, to add to its Diagnostic accuracy Colposcopy and Colposcopic directed Biopsy should be done where ever possible. Several studies have also been done to prove this. V.K. Knutzen, A.G.B. Sherwood (1977) conducted a study on colposcopy and selective biopsy in patients of abnormal cervical cytology. It was 68 done on 150 women and it was concluded that cytology is still the best screening method for detection of premalignant and malignant disease of the cervix; colposcopy is a useful adjunct to cytology and should always be the next step in patients with an atypical or positive cytological smear or an abnormal cervix. Cytology colposcopy and biopsy are complimentary and produced a combined accuracy in final diagnosis of 90.7% in the study.[8]

5. CONCLUSION

Our study shows that Pap smear in a subject with clinical symptoms turned out to be Dysplastic or Neoplastic in 21 %(42) of cases. Our series shows 5.5 %(11 out of 200) cases as HSIL and 16.5 % (33 out of 200) were LSIL and 0.5 %(1 out of 200) was invasive malignancy. Our series exhibits Pap smear sensitivity as 76.2% and a specificity of 100%.

The sensitivity of Pap smear was 76.2%, However the specificity was very high i.e 100%.The positive predictive value was 100% and The negative predictive value was 81.5%.The Diagnostic accuracy of PAP smear cytology was 88.3%.

It concluded that all the existent cases of chronic cervicitis not responding to routine protocol based treatment, colposcopic evaluation is a must and possible biopsy should also be taken to pinpoint the lesion.

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