

COMPARATIVE STUDY OF EVALUATION OF SENSITIVITY AND SPECIFICITY OF CYTOLOGY AND COLPOSCOPY FOR DETECTION OF PRECANCEROUS LESIONS OF CERVIX

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ABSTRACT: BACKGROUND: Cervical cancer is the second most common cancer among women globally and a leading cause of death due to cancer among women. If diagnosed earlier, it has a high cure rate but advanced disease is frequently incurable with very unpleasant consequences. **MATERIAL AND METHODS:** This was a cross sectional study done on a group of 50 women. A detailed clinical history of each patient was taken. The patients were made to lie in dorsal lithotomy position and per speculum examination was done. After evaluating the cervix, Paps smear was taken for cytology with Ayers spatula from ectocervix after rotating at 360 degree and spread on 2 glass slides to prepare thin films and kept in koplins jar and sent for cytology reporting. The patients were then subjected to colposcopy and punch biopsy. **RESULTS:** On comparison with biopsy cervix as gold standard for detection of CIN, cytology had shown Sensitivity - 57.14%, Specificity - 88.88%, NPV - 84.21%, PPV - 66.66%, whereas colposcopy had shown Sensitivity - 80%, Specificity - 80%, NPV - 94.11%, PPV - 50%. **CONCLUSION:** In developing countries like India, cytology, a low cost and easily accessible test, is the most logical screening modality although it has very low sensitivity but detection rates could be further improved using liquid cytology and use of endocervical cytobrush. Colposcopy with high sensitivity is although an important adjunctive screening modality but requires expertise and training for interpretation and is costly.

KEY WORDS: Biopsy, Colposcopy, Cervical cancer, CIN, Cytology, Pre-cancerous lesion.

INTRODUCTION: Cervical cancer is the second most common cancer among women globally and a leading cause of death due to cancer among women.¹ Out of 233,000 women who died each year due to cervical cancer, majority were from developing countries.² In India, it is the most common malignancy according to National Cancer Registry Program, 1988-89 report. The reported incidence of preclinical invasive carcinoma in India is around 1.5/1,000.³ When it presents or is discovered early, it has a high cure rate but advanced disease is frequently incurable with very unpleasant consequences. Thus, prevention of cervical cancer is regarded as a very sensitive and important public health issue.

It is estimated that every year about 90,000 new cases arise in India. In western countries, cervical cancer incidence and deaths have been brought under control using organized cytology screening programmes. In developing countries including India, due to other compelling health problems as control of infectious diseases and population explosion, it is not possible to launch nationwide cytology screening programmes for cervical cancer.

Epidemiological studies have consistently shown the central importance of sexual behavior (early age of first sexual intercourse, multiple sexual partners) in the origin of precursor lesions and

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invasive cervical cancer indicating that a sexually transmissible agent causes these conditions. Indeed, there is now compelling epidemiologic and molecular evidence that cervical infection with HPV (human papilloma virus) causes cervical neoplasms and is present in 99.7% cases of cervical cancer.^{3,4}

Screening modalities used for cervical cancer are cytology, colposcopy, visual inspection of cervix after application of lugol's iodine and acetic acid, HPV DNA testing and education and awareness campaign.

In our study, we intend to compare sensitivity and specificity of cytology and colposcopy in diagnosis of precursor lesions of cervical cancer with biopsy as a gold standard so that recommended screening modalities could be justified.

MATERIAL AND METHODS: This was a cross sectional study conducted in department of obstetrics & gynaecology, Chirayu medical college, Bhopal from January 2011- June 2012. 50 Women of ages between 20- 60 years attending gynaecology OPD for pain abdomen, menstrual disorders, white discharge per vaginum, incontinence urine, post coital bleeding, primary or secondary infertility were subjected for detailed pelvic examination, cytology, colposcopy and colposcopic directed punch biopsy.

A detailed clinical history of each patient was elicited which included complete history of present illness, past history, obstetric history and menstrual history, family history, medical history and her socioeconomic status, complaints of husband, profession of husband and extra marital relationship.

The patients were made to lie in dorsal lithotomy position and per speculum examination was done. After evaluating the cervix, Paps smear was taken for cytology with Ayers spatula from ectocervix after rotating at 360 degree and spread on 2 glass slides to prepare thin films and kept in koplins jar and sent for cytology reporting. The patients were then subjected to colposcopy and punch biopsy.

RESULTS: A total of 50 women were included in the study. Majority (60%) of the patients participated in the study were from age group 21-30 years. Majority of the patients (62%) had parity 3. Only 3.4% patients were nullipara. In our study most common presenting symptom seen was Vaginal discharge + itching vulva seen in 26(52%) of the patients, followed by Vaginal discharge + pain abdomen seen in 10 (20%) of the patients. On per speculum examination 26(52%) of the patients showed hypertrophy followed by ectropion in 12(24%) of the patients, normal cervix was found in 6(12%) of the patients.

In our study Dyskaryosis was seen in 12(24%) of patients on cytology examination and 8(16%) on biopsy examination (table no.1). On colposcopic examination 8(16%) of the patients had grade 2 lesions (table no.2).

On comparison with biopsy cervix as gold standard for detection of CIN, cytology had shown Sensitivity - 57.14%, Specificity - 88.88%, NPV - 84.21%, PPV - 66.66%, Accuracy - 80 % (table no.3). On comparison with biopsy cervix as gold standard for detection of CIN, colposcopy had shown Sensitivity - 80%, Specificity - 80%, NPV - 94.11%, PPV - 50%, Accuracy - 80% (table no.4).

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DISCUSSION: The present study targets to compare the results cytology and Colposcopy for early detection of premalignant lesions of cervix. Results were statistically analyzed and sensitivity and specificity of cytology and colposcopy were evaluated.

In our study, 60% of patients were in the age group of 21-30 years, the sexually active reproductive age group and more prone to sexually transmitted infections. 52% patients were Para 2,56% were residents of rural areas,80% were Hindus, 60% were literate till 5th standard, 92% were married, 56% had age of first intercourse between 15-20years, 60% were in lower middle class,40% were non users of contraception.

The study of Palefsky et al 1999 showed that higher number of previous pregnancies and younger age groups less than 30 years was associated with HPV infections.⁵ Risk factors for HPV infection in young women have primarily shown to reflect sexual activity including younger age, younger age at first intercourse, number of male sexual partners (Burk et al 1996; Bierman et al 1998; Bauer et al 1993; Moscicki et al 1990; Wheeler et al 1993.⁶

In our study, 52% patients had vaginal discharge and itching, 52% showed hypertrophy of cervix indicative of chronic infection of cervix.

In our study 12(24%) of patients had premalignant lesion of cervix in cytology with sensitivity of cytology with biopsy as gold standard was 57.14% and specificity was 88.88%, positive predictive value was 66.66, negative predictive value was 84.21%, whereas in a study done by PetryMenon et al in germany 2003 showed sensitivity of cytology for detection of CIN2 was 43.5%, specificity 98%, positive predictive value 11.4 and negative predictive value 99.7%.⁷ In another study done by Malur PR, Desai BR, Dalal Anita et al in 2009 in Belgaum sensitivity of cytology with biopsy as gold standard was 41.66%, specificity was 96.92 %, PPV was 86.21% and NPV was 79.26%.⁸

In our study 16(32%) patients showed grade 1 and 2 lesions in colposcopy with sensitivity of colposcopy with biopsy as gold standard was 80% and specificity was 80%, negative predictive value was 94.11, positive predictive value was 50 and accuracy of 80%. In a study done by Malur PR, Desai BR, Dalal Anita et al in 2009 in Belgaum sensitivity of colposcopy with biopsy as gold standard was 80%, specificity was 81.54 %, PPV was 66.66% and NPV was 89.83%.⁸ In another study of Lozowski et al sensitivity of colposcopy was 96% and specificity of 29% and Stewart et al study had sensitivity of 89% and specificity of 52%.^{9,10}

On biopsy, 8(16%) patients had premalignant lesions so false positives were higher in colposcopy than cytology.

CONCLUSION: In developing countries like India with large population burden, cytology, a low cost and easily accessible test, is the most logical screening modality although it has very low sensitivity but detection rates could be further improved using liquid cytology and use of endocervicalcytobrush. Colposcopy with high sensitivity is although an important adjunctive screening modality but requires expertise and training for interpretation and is costly.

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Findings	Cytology n (%)	Biopsy n (%)
No abnormality detected	12(24)	18(36)
Inflammatory	26(52)	24(48)
Dyskaryosis/ CIN	12(24)	08(16)
Total	50	50

Table no. 1: Distribution of the patients according to the findings of cytology and biopsy.

*pap smears were evaluated by Bethesda system

Colposcopy finding	Number of patients	Percentage
No abnormality detected	34	68
Grade 1	8	16
Grade 2	8	16
Grade 3	-	-

Table no. 2: Distribution of the patients according to the findings of colposcopy

*For colposcopy, Coppersson grading was followed

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Cytology	Biopsy		Total(n=50)
	Positive	Negative	
Positive	8	4	12
Negative	6	32	38
Total	14	36	50

Table no. 3: Comparison of cytology with biopsy cervix as gold standard for detection of CIN

Sensitivity - 57.14%, Specificity - 88.88%, NPV- 84.21%, PPV - 66.66%, Accuracy - 80%

Colposcopy	Biopsy		Total(n=50)
	Positive	Negative	
Positive	8	8	16
Negative	2	32	34
Total	10	40	50

Table no. 4: Comparison of colposcopy with biopsy as gold standard for detection of CIN

Sensitivity - 80%, Specificity - 80%, NPV - 94.11%, PPV - 50%, Accuracy - 80%

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