

Correlation of Pap smear and colposcopic finding with directed biopsy in detection of cervical neoplasm

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Abstract

Introduction: Cancer of uterine cervix is the most common genital tract malignancy. Pap smear though widely used screening test for cervical cancer has the disadvantage of low sensitivity. Colposcopy has higher sensitivity compared to Pap smear. Concurrent screening with Pap smear and colposcopy can overcome this problem. **Aim:** The aim of the study was correlation of Pap smear and colposcopic finding with directed biopsy in detection of cervical neoplasm. **Methods:** The Present study was conducted in the Department of Pathology, Gujarat Adani Institute of Medical Science, Bhuj, Kutch. During the study period in 57 symptomatic patient's simultaneous Pap smear, colposcopic examination, followed by directed biopsy was performed. Data was recorded and analyzed. **Results:** In correlation between cytology and biopsy, sensitivity of cytology was 82.3%, specificity 96.9% and accuracy of 92%. In correlation between colposcopy and biopsy, sensitivity of colposcopy was 94.1%, specificity 87.8% and accuracy of 90%. **Conclusion:** High sensitivity in colposcopy as compared to cytology and high specificity in cytology as compared to colposcopy emphasizes the need for pairing these methods to achieve better results.

Keywords: Accuracy, Cancer, Colposcopy, cytology, Histopathology, Pap smear

Introduction

Cancer of cervix is the leading cause of cancer-related death among women in developing countries, where more than 80% of new cases occur. Cervical cancer continues to be the most common genital tract malignancy in India. Cancer of cervix is preceded by recognizable precancerous histological and cytological changes which provide opportunity for early detection of cervical neoplasm [1,2].

Cervical cytology is the accepted method of screening for cervical cancer all over the world but it has low sensitivity. In the presence of an abnormal Pap smear, a tissue diagnosis is essential before proceeding with definitive therapy. Although cytology is accurate in predicting severity of cervical lesion, it cannot determine their location or extent. A random cervical biopsy in the absence of visible lesion may result in a false negative histologic diagnosis [3].

With the introduction of colposcope, comparative studies substantiated that it was possible to accurately localize the area of abnormal cervical epithelium by colposcopic examination for the selection of biopsy site. Colposcopy as an adjunctive screening test has high sensitivity and can provide immediate results for evaluation of cervical lesions. Executing targeted biopsy, colposcopy can be useful in defining diagnosis of preinvasive lesions and carcinoma of cervix [4,5].

Complete and accurate assessment of the nature of a cervical neoplastic lesion relies on three methods of investigation: cervical smear, examination of cervix with colposcope and histology of a biopsy specimen.

Ideally the grade of cervical neoplasia discovered during all three methods should be the same, but in practice disagreement of more than one method is not uncommon [6]. The aim of the study was correlation of Pap smear and colposcopic finding with directed biopsy to assess the advantage of concurrent testing by

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cytology and colposcopy in the detection of cervical neoplasm.

Materials and Methods

Study Design and Study Settings- The Present study was conducted in the Department of Pathology, Gujarat Adani Institute of Medical Science, Bhuj, Kutch for a period of 12 months after taking approval from Institutional Ethical Committee.

Sample Collection- During the study period 57 female patients above the age of 18 years, with symptoms of vaginal discharge and other gynecological problems attending the outpatient department of OBG following informed consent were subjected for concurrent Pap smear examination, colposcopy and directed biopsy.

Inclusion and Exclusion Criteria- Pregnant women, teenage girls, hysterectomy patients, unsatisfactory smear and inadequate biopsies were excluded. Total of 50 cases were included in the study.

Methodology- Clinical details were obtained according to the structured proforma. The relevant clinical findings were collected by personal interview and examination of the patient. Pap smears were taken using Ayre’s spatula from squamocolumnar junction. Material

spread evenly on glass slide and fixed with cytofix containing 95% ethyl alcohol and carbowax. Fixed smears received were stained with Pap stain and reported according to The Bethesda System.

Colposcopic examination was performed using Gold way SLC-2000 video colposcope. Normal saline was applied to the cervix to remove excess mucus. Green filter of colposcope was used to appreciate vascular pattern and 3% acetic acid applied to visualize the atypical transformation zone, following which biopsies were taken using punch biopsy forceps. Biopsy specimens received in 10% formalin fixative were routinely processed and sections stained with hematoxylin and eosin. Results were categorized according to WHO.

Statistical analysis- The data was coded and entered into Microsoft Excel spreadsheet. Analysis was done using SPSS version 15 (SPSS Inc. Chicago, IL, USA) Windows software program. Descriptive statistics included computation of percentages. For all tests, confidence level and level of significance were set at 95% and 5% respectively. Statistical analysis was carried out by calculating sensitivity, specificity, positive and negative predictive value for Pap smear and Colposcopy.

Results

Total of 50 cases were included in the study. Age range was from 20-70 years with mean age of 36.4 years. Majority of patients were in the age group of 21-30 years with 19 (38%) cases followed by 31-40 years 17 (34%), 41-50 years 8 (16%), 51-60 years 4 (8%), 61-70 years 1 (2%) and 11-20 years 1 (2%).

Commonest clinical presentation was white discharge per vagina (WDPV) with 37 (74%) cases, followed by irregular bleeding 6 (21%), mass per vagina 3 (6%), post-menopausal bleeding 2 (4%) and pain abdomen with WDPV 2 (4%). In majority of patients’ clinical status of cervix was cervical erosion with 27 (54%) cases, followed by cervicitis 13 (26%), cervical hypertrophy 7 (14%), atrophy 2 (4%) and cervical polyp 1 (2%). Cytological diagnosis was inflammatory smear in 32 (64%) cases followed by LSIL in 7 (14%) Histological diagnosis was chronic nonspecific cervicitis among 33 (66%) cases and CIN-19 (18%) cases.

Table-1: Distribution of cases according to colposcopic findings.

Colposcopic Findings	Number of cases	Percentage
Acetowhite area	20	40.0
Punctation	06	12.0
Mosaicism	02	04.0
Surface irregularity	02	04.0
Atypical vessels	02	04.0
Multiple abnormal colposcopic findings	18	36.0
Total	50	100

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Commonest colposcopic finding was acetowhite area with 20 (40%) cases, followed by multiple abnormal colposcopic finding 18 (36%) [Table 1].

Table-2: Distribution of colposcopic diagnosis.

Colposcopic Diagnosis	Number	Percentage
Normal	03	06.0
Inflammatory	27	54.0
CIN1	12	24.0
CIN2	05	10.0
CIN3	01	02.0
Invasive carcinoma	02	04.0
Total	50	100

Colposcopic diagnosis was inflammatory in 27 (54%) cases followed by cervical intraepithelial neoplasia (CIN) 1 in 12 (24%) patients [Table 2].

In correlation between cytology and biopsy, sensitivity of cytology was 82.3%, specificity 96.9%, false negative rate of 17.6%, false positive rate of 3% and accuracy of 92%.

In correlation between colposcopy and biopsy, sensitivity of colposcopy was 94.1%, specificity 87.8%, false negative rate of 6.25%, false positive rate of 12.1% and accuracy of 90%.

Discussion

Cancer of cervix is the fourth most common cancer in women, with an estimated 528,000 new cases in 2012. Large majority (around 85%) of the global burden occurs in the less developed regions, where it accounts for almost 12% of all female cancers.

Almost nine out of ten (87%) cervical cancer deaths occur in the less developed regions [1]. In the present study, the age of patients ranged from 20 to 70 years with the mean age of 36.4 years, which is comparable to study by Joshi C et al where the age range was 20 to 65 years, Similar distribution of patients has been observed in other studies also [5-7]. White discharge per vagina was the most common symptom with 37(74%) cases, which was comparable to studies done by Chaudhary RD et al and Bhalerao A et al [8,9]

In the present study, clinical status of cervix in majority of patients was cervical erosion with 27(54%) cases. Similar findings were observed in the studies performed by Chaudhary RD et al and Bhalerao A et al, where majority were cervical erosion with 173(86%), 156(78%) cases respectively [8,9]. Most common colposcopic finding was acetowhite area with 20(40%) cases, similarly reported by Joshi C et al and Krishnegowda et al [10,11].

In the present study, on pap smear examination, squamous intraepithelial lesion of all grades were seen in 13(26%) cases [LSIL in 7(14%), HSIL in 6(12%)] and SCC in 2(4%), comparable to other studies [10,11].

Colposcopy was non-neoplastic in 30 (60%) cases, CIN of all grades were seen in 18(36%) cases [CIN1 in 12(24%), CIN2 in 5(10%), CIN3 in 1(2%)] and 2(4%) were invasive carcinoma. Seshadri L et al study showed CIN of all grades in 101(43.3%) cases, 14(6.1%) invasive carcinoma and non-neoplastic in 118(50.6%) cases [12]. In the present study Histopathological diagnosis of cervicitis was seen 33(66%) cases, CIN of all grades in 15(30%) cases [CIN1 in 9(18%), CIN2 in 5(10%), CIN3 in 1(2%)] and SCC 2(4%) comparable to study by Seshadri L et al [12].

Sensitivity of pap smear in the present study was 82.3%, specificity was 96.9% and diagnostic accuracy was 92% which is comparable to study by Maziah et al (90%), Bhatla et al (89%). It was seen that the positive predictive value of Pap smear was highest for HSIL and malignancy.

This is similar to study by Naik et al [13-15]. Specificity of the pap smear was also comparable with studies by

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Al Alwan et al 2001 (98.4%),[16] Randomir et al 2005 (88%),[17] and Mojgan et al 2011 (93%)[18].

Sensitivity of colposcopy was 94.1% and specificity was 87.8%. The accuracy of colposcopy in the present study was 90%, which is in parallel to the findings of Maziah et al (94%) and Ashmita et al (86.54%)[14-16].

Cytology and colposcopy showed 100% correlation for high grade lesions. High false negative rate on cytology was seen in cases of inflammatory smear and high false positive rate on colposcopy in cases of CIN1, implying the importance of repeat smear and follow-up in these cases.

Conclusion

High sensitivity in colposcopy as compared to cytology and high specificity in cytology as compared to colposcopy emphasizes the need for pairing these methods to achieve better results.

Advantage of this study to existing knowledge- When properly used, colposcopy complements cytology by accurately defining the most suspicious area of the cervix for taking biopsy and there by increases the diagnostic accuracy.

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References

1. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer*. 2015 Mar 1;136(5):E359-86. doi: 10.1002/ijc.29210. Epub 2014 Oct 9.
2. Holowaty P, Miller AB, Rohan T, To T. Natural history of dysplasia of the uterine cervix. *J Natl Cancer Inst*. 1999 Feb 3;91(3):252-8.
3. Nanda K, McCrory DC, Myers ER, Bastian LA, Hasselblad V, Hickey JD, Matchar DB. Accuracy of the Papanicolaou test in screening for and follow-up of cervical cytologic abnormalities: a systematic review. *Ann Intern Med*. 2000 May 16;132(10):810-9.
4. Kholi B, Arya BS. Comparison of Pap smear and colposcopy in detection premalignant lesions of cervix. *J South Asian Fed Menopause Soc* 2014; 2:5-8.

5. Joshi C, Kujur P, Thakur N. Correlation of Pap Smear and Colposcopy in Relation to Histopathological Findings in Detection of Premalignant Lesions of Cervix in A Tertiary Care Centre. *Int J Sci Stud* 2015; 3:55-60.

6. Pimple SA, Amin G, Goswami S, Shastri SS. Evaluation of colposcopy vs cytology as secondary test to triage women found positive on visual inspection test. *Indian J Cancer*. 2010 Jul-Sep; 47 (3): 308-13. doi: 10.4103/0019-509X.64726.

7. Boicea A, Pătrașcu A, Surlin V, Iliescu D, Schenker M, Chiuțu L. Correlations between colposcopy and histologic results from colposcopically directed biopsy in cervical precancerous lesions. *Rom J Morphol Embryol*. 2012; 53 (3 Suppl): 735-41.

8. Chaudhary RD, Inamdar SA, Hariharan C. Correlation of diagnostic efficacy of unhealthy cervix by cytology, colposcopy and histopathology in women of rural areas. *Int J Reprod Contracept Obstet Gynecol* 2014; 3:213-218.

9. Bhalerao A, Kulkarni S, Ghike S, Kawthalkar A, Joshi S. Correlation of pap smear, colposcopy and histopathology in women with unhealthy cervix. *J South Asian Feder Obst Gynae* 2012; 4:97-98.

10. Joshi C, Kujur P, Thakur N. Correlation of Pap Smear and Colposcopy in Relation to Histopathological Findings in Detection of Premalignant Lesions of Cervix in A Tertiary Care Centre. *Int J Sci Stud* 2015; 3:55-60.

11. Krishnegowda S, Veena MS. Efficacy of colposcopy technique with Pap smear and histology in screening of cervical lesions. *Int J Reprod Contracept Obstet Gynecol* 2014; 3:696-702.

12. Seshadri L, Jairaj P, Krishnaswami H. Colposcopy in the diagnosis of cervical neoplasia. *Indian J Cancer*. 1990 Sep;27(3):180-6.

13. Bhatla N, Mukhopadhyay A, Kriplani A, Pandey RM, Gravitt PE, Shah KV, Iyer VK, Verma K. Evaluation of adjunctive tests for cervical cancer screening in low resource settings. *Indian J Cancer*. 2007 Apr-Jun;44(2):51-5.

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14. Maziah AM, Sharifah NA, Yahya A. Comparative study of cytologic and colposcopic findings in preclinical cervical cancer. *Malays J Pathol* 1991; 13:105-108.

15. Naik R, Minj MM, Panda R et al. Cytohistological correlation and accuracy of the Pap smear test in diagnosis of cervical lesions: a hospital based cross-sectional study from Odisha, India. *Medical Science* 2015; 3:242-249.

16. Ashmita D, Shakuntala PN, Rao SR, et al. Comparison and Correlation of Pap smear, Colposcopy and Histopathology in Symptomatic Women and Suspicious Looking Cervix in a Tertiary Hospital Care Centre. *Int J Health Sci Res* 2013; 3:50-59.

17. Alwan A. Colposcopy, cervical cytology and human papillomavirus detection as screening tools for cervical cancer. *Eastern Mediterranean Health Journal* 2001;7:100-105.

18. Živadinović R, Radović M, Lilić V, Petrić S. Grading the severity of preinvasive changes of the uterine cervix by colposcopy and exfoliating cytology. *FactaUniversitatis Series: Medicine and Biology* 2005;12(1):55-59.

19. Karimi Zarchi M, Binesh F, Kazemi Z, Teimoori S, Soltani HR, Chiti Z. Value of colposcopy in the early diagnosis of cervical cancer in patients with abnormalpap smears at ShahidSadoughihospital, Yazd. *Asian Pac J Cancer Prev*. 2011;12(12):3439-41.

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