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Original Research Article

Correlation of Pap smear and Colposcopy in Relation to Histopathological Findings in Detection of Premalignant Lesions of Cervix

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Abstract: The objective was to assess the correlation of pap smear and colposcopy in relation to histopathological findings in detection of premalignant lesions of cervix. A total of 200 women with lesions of cervix were recruited for the study. Pap smear and colposcopy was performed in all the patients. Final correlation of pap smear and colposcopy were based on histopathology. Majority of patients in our study presented with complains of white discharge 119 (59.5%) out of 200 women. Followed by complains of post coital bleeding (15.5%), irregular menstrual cycles (10.5%) and intermenstrual bleeding(10.5%). In our study sensitivity of pap smear was lower(50%) than colposcopy which had high sensitivity(96.42%) and specificity of pap smear was higher (86.62%) than colposcopy (39.53%) respectively. Pap smear, colposcopy and directed cervical biopsy together are useful and complementary in arriving at a correct diagnosis. Benign cervical erosions respond well to local/ systemic antibiotics. Premalignant lesions need local ablative therapy and subsequent follow up. Hence the study concludes that screening programme and awareness regarding cervical cancer should be enhanced at the grass root level.
Keywords: Pap smear, Colposcopy, Premalignant lesion of cervix.

INTRODUCTION

Globally, cervical cancer is the third most common cancer in women and the 3rd most frequent cause of cancer death [1]. Cancer of cervix is preventable, yet approximately 529,000 new cases in 2008 and more than 275,000 deaths happen each year among women worldwide [1]. India, which accounts for the one-sixth of the world's population, also bears the one-fifth of the world's burden of cervical cancer [2]. Cervical cancer is a leading form of cancer among women living in low resource regions of the world and often kills women at young age when they are still raising families.

Human Papillomavirus (HPV) is considered the primary driving force behind malignant transformation of cervical cells, with certain high-risk HPV types now labeled as the first-ever identified, indisputable, solely infectious cause of a human cancer [3].

The diagnostic algorithm of various organized screening programmes consists of cytology & colposcopy (which help in detecting the abnormality) & which can be established by histology (grade of lesion).

Colposcopy is an optical method of visualizing lower female genital tract under bright illumination under stereoscopic vision. It is a simple non invasive OPD procedure which helps in determining the location, size and extent of abnormal cervical lesions and serves for detecting the site for biopsies and for selecting the most appropriate treatment.

Colposcopy is complimentary to cytology. Cytology (pap smear) is the lab method while colposcopy is the clinical method of detection. Colposcopy is more than a simple intermediate link between cytologic screening and histologic diagnosis [4]. Colposcopic guided biopsy of suspicious areas provides the final diagnosis and is taken as the gold standard in diagnosis of intra epithelial lesions.

Pap smear has become a routine method of cervical cancer screening. Also, in a developing country like India, cytology based screening programmes are difficult to organize because of absence of trained manpower, infrastructure, logistics, costs involved and has other limitations like low sensitivity and high false negative rates [5].

The long pre-clinical stage of cervical cancer, during which precursor lesions can be treated conservatively and successfully, is an ideal target for screening and treatment. Success of screening programmes is limited in the villages of India wherein females are illiterate, health infrastructure is mediocre, and cervical screening is unknown [6]. The aim of this study was to find a correlation of pap smear and colposcopy in relation to histopathological findings in detection of premalignant lesions of cervix in central India.

METHOD

This prospective study was conducted in the Department of Obstetrics and Gynaecology at Sri Aurobindo Medical College and PG Institute Indore for 18 months after the approval of Ethics Committee from October 2013 to April 2015. The material of present study was collected from women who met the inclusion criteria and gave the consent for colposcopy and directed biopsy.

Inclusion criteria

- All of the patients with suspicious cervix having abnormality either in Pap smear or in biopsy Symptomatic patients with normal cervix having abnormality either in Pap smear or in biopsy.
- Abnormal vaginal discharge, abdominal pain, irregular menstrual bleeding, post-menopausal bleeding, postcoital bleeding, prolapse, and burning micturition.

Exclusion criteria

- Clinically asymptomatic with normal cervix suspicious cervix within normal Pap smear or biopsy reports,
- Unsatisfactory smears for evaluation.
- Women >65 years and <20 years, women with frank cancer, pregnant women, and post total hysterectomy patients

METHODOLOGY

A careful history including demographic data like age, socioeconomic status, education, parity, age at marriage of the patient was taken. After explaining the procedure, the patient laid comfortably in dorsal position. Light was positioned to visualize the cervix clearly. Sim's speculum was inserted and anterior wall of vagina was retracted by anterior vaginal wall retractor, cervix was brought into view by gentle movement of the speculum encouraging the patient to relax. Appearance of cervix was noted. To obtain an adequate sample of the transformation zone the Ayre's spatula was inserted into the cervical canal. It then rotated by 360 degrees, clockwise and anti-clockwise, keeping it firmly attached to the cervix. The device was twisted 3-5 times.

The material obtained was smeared evenly on a glass slide and inserted into a bottle containing 10% formaldehyde. The smear sent to the cytopathology laboratory at Sri Aurobindo Institute of Medical Sciences for reporting. The cervical smear stained with Papanicolaou technique and then reported according to the Bethesda System.

Cytology considered positive if it revealed any of the following lesions- atypical Squamous Cells of Undetermined Significance (ASCUS) and Atypical squamous cells- cannot exclude HSIL' (ASC-H), Low Grade Squamous Intraepithelial lesion (LSIL), High Grade Squamous Intraepithelial lesion (HSIL) or cells suspicious of malignancy. Negative smears included those with normal and inflammatory report.

The patients with positive cytopathology report were subjected to colposcopy. Then colposcopy was performed using video colposcope. The cervix was visualized under low power to note any abnormal findings. Capillaries and surface blood vessels of the cervix were visualized under low power to note any abnormal findings. Capillaries and surface blood vessels were examined with a green filter. 3-5% glacial acetic acid was gently applied twice over the cervix for a total period of one minute, to ensure appropriate acetowhite reaction. Transformation Zone was defined between the old and the new squamo-columnar junctions. Colposcopy considered unsatisfactory if the new squamo-columnar junction is not visualized completely and endo-cervical curettage was performed. The colposcopy scored using Reids Scoring method. Examination of each quadrant was done in a clockwise direction, acetowhite reaction was seen in the transformation zone; then margin, colour, vessels and colposcopy applied and findings were documented. Reids Colposcopic Scoring/ Index were done. Lugols iodine did not stain the acetowhite areas and the desired areas. Colposcopic guided biopsies were taken with punch biopsy forceps from the site with highest score and transferred to vial containing 10% formaldehyde and sent for histopathology examination. Unsatisfactory colposcopy was recorded separately. (Endocervicalcurretings was obtained from all the women for analysis). Pap smear and colposcopy was correlated with histopathology obtained from colposcopic directed biopsies.

Cervical biopsy is the gold standard for detection of cervical cancer. So, all the abnormal cytological findings on Pap's smear were subjected to colposcopy and directed cervical biopsy.

RESULTS

Out of 200 women there were 4 (2%) in the age group 21-30 years, 43 (21.5%) in the age group 31-40 years, 65 (32.5%) in the age group 41-50 years, 46 (23%) were in the age group 51-60 years and 42 (21%) were in the age group > 60 years.

Majority 119 (59.5%) presented with white discharge, 31 (15.5%) presented with postcoital bleeding, 21 (10.5%) each of irregular cycles and intermenstrual bleeding, 17 (8.5%) were asymptomatic, 11 (5.5%) each presented with pain in abdomen and postmenopausal bleeding, 1 (0.5%) presented with MPB and 8 (4%) presented with other complaints. Distribution of women according to per speculum examination findings 2 (1%) had atrophy, 21 (10.5%) had congestion, 80 (40%) had erosion, 92 (46%) had hypertrophy and 5 (2.5%) had polyp. The distribution of women according to their per vaginum findings in 83 (41.5%) women, the pervaginum findings were normal, while in majority 117 (58.5%) bulky uterus was seen.

PAP smear has showed maximum 158 (79%) women having inflammatory, in 2 (1%) it showed LSIL, in 5 (2.50%) HSIL was the finding, in 30 (15%) it showed ASCUS and in 5 (2.50%) findings were suggestive of bacterial vaginosis (Table 1).

Colposcopy showed 68 (34%) acetowhite area, 69 (34.5%) metaplasia, 11 (5.50%) mosaic, 16 (8%) punctuate, 18 (9%) abnormal vascularity, 10 (5%)6, and in 8 (4%) the findings were suggestive of polyp/growth(Table 1).

Histopathological findings showed in 170 (85%) chronic cervicitis, 4 (2%) it was CIN-1, in 5 (2.50%) chronic cervicitis with carcinoma in situ, 2 (1%) well differentiated squamous cell carcinoma grade 1, in 5 (2.5%) it was 5, in 12 (6%) it was moderately differentiated squamous cell carcinoma grade 2 and in 2 (1%) features were suggestive of neuroendocrine tumors (Table 1).

All patients with unhealthy cervix were subjected to pap smear and colposcopy. Biopsy is essential in every case where signs and symptoms raise the slightest suspicion and it is irrespective of whether cervical smear contains malignant cells. Sensitivity of Pap smear in our study was 50% specificity of Pap smear was 86.62%. Positive predictive value of Pap smear (PPV) was 37.83% and negative predictive value of Pap smear (NPV) was 91.41%. For colposcopy, Sensitivity in our study was high as 96.42% but specificity was found to be low as 39.53%. PPV was found to be 20.61% .NPV was 98.55%. In our study sensitivity of Pap Smear was lower(50%) than colposcopy which had high sensitivity (96.42%) and specificity of pap smear was higher (86.62%) than colposcopy (39.53%)(Table 2). Sensitivity of Pap smear can be increased by eliminating high false negative results by proper technique of slide preparation, fixation and reading. The Gold Standard was (Histopathology) Cervical Biopsy.

Table-1: PAP Smear, Colposcopy and Histopathology findings in unhealthy cervix patients

	Number	**Percentage**
PAP Smear Findings		
Inflammatory	158	79.00
LSIL	2	1.00
HSIL	5	2.50
ASCUS	30	15.00
Bacterial vaginosis	5	2.50
Colposcopy Findings		
Acetowhite area	68	34.00
Metaplasia	69	34.50
Mosaic	11	5.50
Punctate	16	8.00
Abnormal vascularity	18	9.00
Polyp	10	5.00
Growth	8	4.00
Histopathology Findings		
Chronic cervicitis	170	85.00
CIN-1	4	2.00
Chronic cervicitis with carcinoma in situ	5	2.50
Well differentiated squamous cell carcinoma grade 1	2	1.00
Moderately differentiated squamous cell carcinoma grade 1	5	2.50
Moderately differentiated squamous cell carcinoma grade 2	12	6.00
Features of neuroendocrine tumors	2	1.00

Table-2: Sensitivity and Specificity of Colposcopy and PAP Smear

Estimated Value	Colposcopy (%)	PAP Smear (%)
Sensitivity	96.4	50
Specificity	39.5	86.6
Positive Predictive Value(PPV)	20.6	39.5
Negative Predictive Value(PPV)	98.5	91.4

DISCUSSION

Invasive cancer of cervix is considered to be a preventable condition as it is associated with a long pre invasive stage (CIN) making it amenable to screening and treatment. The incidence of cervical cancer can be reduced by as much as 80 % if the quality, coverage and follow up of screening methods are of high standard.

Unhealthy cervix is a group of cervical lesions, mostly chronic which includes chronic cervicitis, endocervicitis, cervical erosions, lacerations, polyps and leukoplakia. These conditions can harbourpe malignant lesions. When a gynaecologist encounters any of these conditions, it is necessary to evaluate them in most purposeful manner to rule out any premalignant lesion.

Of the benign lesions HPV changes were common, koilocytosis, squamous metaplasia with koilocytosis, koilocyticatypia was grouped as HPV changes. Incidence of invasive carcinoma was 3/200 = 0.01%and was contributed to premalignant condition CIN II, III. Cervical cancer screening is an important part of preventive health care of women. Attempts are being made to improve efficacy of screening to decrease morbidity and mortality due to cancer cervix. The cervical screening algorithm recommends treatment of infection and repeat Pap smear after 4to 6months [7]. The main reason for false negativity of cytology was due to sampling errors; samples are suboptimal and are inadequate for interpretation [8].

In study by Seckin *et al*. [9], 29.1% had normal colposcopy. In study by Wills *et al*., 2.5% had normal colposcopy in women with inflammatory smear. In our study 71% women had normal colposcopy, Seckin *et al*. [9] found that 71% of benign lesions had normal colposcopy.

HPV-related lesions were high in our study. In Seckins study HPV-relatedlesionswere64.5%, with Frisch it was 8%, Frisch is of the opinion that colposcopy of women with cytological abnormality is useful to detect unrecognized cases of CIN [10]. Significant correlation is seen between Pap smear and cervical histopathology. Positive predictive value (PPV) was highest for malignancy followed by benign lesions LSIL and HSIL; this correlates with Bendet in which PPV was 91.8% for malignancy and 35% for benign lesions. They reported statistically significant agreement between cytology and histology in one grade of disease. CIOCAM also reported overall concordance of 86.9% between histopathology and Pap smear in their series of 3,229 women. They reported sensitivity to77% PPV of 74% and Negative predictive value (NPPV) of 45% of Pap smear. In statistical analysis report of 2001 PPV of CIN III was 86%.

There is a strong correlation between findings of Pap smear and Histopathology and Colposcopy and Histopathology. Therefore, Pap smear, Colposcopy and directed Cervical Biopsy together are useful and complementary in arriving at a correct diagnosis. Benign cervical erosions respond well to local/ systemic antibiotics. Premalignant lesions need local ablative therapy and subsequent follow up. Hence the study concludes that screening programme and awareness regarding cervical cancer should be enhanced at the grass root level.

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