Original Research Article

An Analytical Study Assessing the Role of Colposcopy and Paps Smear in Cervical Carcinoma Screening in Tertiary Care Facility

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Abstract

Aim: The aim of the present study was to assess the role of colposcopy and paps smear in cervical carcinoma screening in tertiary care facility.

Methods: The prospective observational comparative study was conducted at Department of Obstetrics and Gynaecology for 18 months. 200 patients were included in the study.

Results: In this study, 34% women belong to age group 41-50 years. 23% women belong to 51-60 years of age. 3% women belong to 20-30 years of age, 19% women belong to 31-40 years of age and 21% women are more than 60 years of age. In this study population, majority 62% presented with white discharge, 16% presented with post-coital bleeding, 12% each of irregular cycles and intermenstrual bleeding, 8% were asymptomatic, 6% each presented with pain in abdomen and postmenopausal bleeding, 1% presented with dyspareunia and 4% presented with other complaints. In this study there were 2 % with parity 1, 22% with parity 2, 28% with parity 3, 25% with parity 4, 8% with parity 5, 7% with parity 6, 7% with parity 7 and 1% with parity 8. In present study the per vaginum findings 60% bulky uterus was seen while in 40% women it was normal. In this study, PAP smear has showed maximum 80% women having inflammatory, in 1% it showed LSIL, in 2% HSIL was the finding, in 15% it showed ASCUS and in 2% findings were suggestive of bacterial vaginosis. In this study, authors found that colposcopy showed 33% acetowhite area, 36% metaplasia, 6% mosaic, 7% punctuate, 10% abnormal vascularity, 5% polyp, and in 3% the findings were suggestive of polyp/growth.

Conclusion: Colposcopy is definitely more sensitive and accurate than pap smear. By combining Pap smear with colposcopy, we can maximize the sensitivity and specificity of cancer cervix screening.

Keywords: Cervical biopsy, Colposcopy, Pap smear, Unhealthy cervix

Introduction

Cervical cancer is a notable public health issue, particularly in developing countries, where approximately 80% of cases are reported. The cervix is susceptible to severe infections of the upper genital tract, as well as viruses and carcinogens, which can lead to the development of invasive carcinoma. [1] Although cervical cancer is preventable, it has a high incidence rate, with over 600,000 new cases and 340,000 fatalities recorded globally in 2020. [2] According to the GLOBOCAN 2020 report, cervical cancer constituted 9.4% of all cancer cases in India and 18.3% of new cancer cases in the country. [3] Unfortunately, cervical cancer is a prevalent cancer in India and a primary cause of cancer-related deaths among women in low- and middle- income nations. Based on population-based surveys, it has been found that cervical cancer screening rates are significantly lower in developing countries (19%) compared to developed countries (63%). [4]

A research conducted in 2020 using the National Family Health Survey data revealed that just 22% of women in India had undergone a cervical examination. At present, a range of screening methods are available for the early detection of cervical cancer and its precursor lesions. They vary in terms of their feasibility, testing characteristics, and economic considerations. Cervical cancer has a treatable and curable precursor lesion that can be detected through effective screening procedures.

Therefore, the incidence and morbidity of cervical cancer can be reduced. Cervical cancer screening is a highly successful public health measure for cancer prevention that has been widely implemented. The significance of cervical screening stems from the fact that the development of invasive cervical cancer is typically preceded by an extended period of precancerous lesions that can be readily detected through routine screening and can be treated using simple methods. This renders cervical cancer a largely preventable disease with regular screening. [5] However, cervical cancer is now considered preventable through cervical screening and curable, particularly if detected early, which emphasizes the importance of "prevention is better than cure". [6,7]

Though Pap smear is the preferred screening modality, there are few screening programmes available. Pap smears are typically taken in the outpatient sections of public and private hospitals when patients appear with gynaecological symptoms. As a result, Pap smear is an essential component of women's comprehensive healthcare in India and other countries. [8] Pap smears are done commonly in PID patients and most of them are reported as inflammatory. [9] In the Bethesda system, when the type of infection is not specified, it is classified under benign cellular changes. [10] After prescribing antibiotics if repeat pap smears persist as inflammatory smears, then colposcopy is recommended. [11] Colposcopy is widely used to detect Cervical Intraepithelial Neoplasia (CIN) to guide cervical biopsy sites with clinical symptoms of suspected cervical diseases. [12]

The aim of the present study was to assess the role of colposcopy and paps smear in cervical carcinoma screening in tertiary care facility.

Materials and Methods

The prospective observational comparative study was conducted at Department of Obstetrics and Gynaecology, Jawaharlal Nehru medical College and Hospital, Bhagalpur, Bihar, India for 18 months. 200 patients were included in the study.

Inclusion Criteria

All the high-risk women of reproductive, perimenopausal and postmenopausal age group who presented with the unhealthy cervix on naked eye examination (hypertrophied cervix, cervical ectropion, any cervical growth), abnormal vaginal discharge and post coital bleeding intermenstrual spotting/bleeding cervix that bleeds on touch abnormal uterine bleeding were included in this study.

Exclusion Criteria

Women with bleeding per vaginum at the time of examination, women with frank invasive cancer, women who underwent hysterectomy, pregnant women, patients not giving consent for study were excluded in this study.

Detailed history of the women included age, presenting complains, obstetric outcome, marital history/number of partners and use of contraceptives. We also took into account age at first intercourse and age at marriage. Family history, socioeconomic history and personal (hygiene and addictions to smoking and drug) were also taken. After obtaining the history, a general physical examination and systemic examination was carried out. Per speculum examination was performed to note any abnormality on direct visual inspection of the cervix without magnification. Abnormal finding were noted. Both pap and colposcopy done

In case there was abnormal cytology report, the patient's cervical biopsy were done. Histopathology is the gold standard for cervical cancer. Abnormal Pap's smear and colposcopy co-related with danced cervical biopsy.

Methodology

After explaining the procedure, the patient laid comfortably in dorsal position Light was positioned to visualise the cervix clearly. Sims speculum and anterior wall of vagina retracted by anterior vaginal wall retractor, cervix 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 al de Ayre's spatula was 360 degrees, clockwise and anti- clockwise, keeping if firmly attached to the cervix. The device should be turned at least 3-5 times. The material obtained was smeared evenly on a glass slide into a bottle containing 10%.

The cervical smear stained with papaniculao technique and then reported according to the Bethesda system. Cytology considered positive if it revealed any of the following atypical Squamous Cells of Undetermined significance (SCUS ASC-H. Low Grade Squamous Intraepithelial lesion (SI L), High Grade Squamous Intraepithelial lesion (HSI) or cells suspicion of malignancy. Negative smears included those with an inflammatory report. Then colposcopy was performed using video colposcope in all women, colposcopy was done according to conventional method and Modified Reidscolposcopic index (RCI) was performed. 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 squamocolumnar junctions. Colposcopy considered unsatisfactory if the new

squamocolumnar junction is not visualised and endo-cervical curettage will be performed. The colposcopy Reids scoring method. Examination of each quadrant was done in 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 was done. Lugols iodine did not stain the acetowhite area. Colposcopic guided biopsies were taken with punch biopsy from the site with highest score and transferred to vial containing formaldehyde and sent for histopathology examination colposcopy was recorded separately (endocrocal p obtained from all the women for analysis). Cervical biopsy is the gold standard for detection of cervical cancer all the abnormal cytological findings on Pap's smear was subjected to colposcopy and directed cervical biopsy.

Statistical Analysis

All results were compiled and subjected to statistical analysis. Data was entered into Microsoft excel and SPSS (Statistical package for social science) version 23.0 was used for descriptive statistics. The sensitivity, specificity, predictive value of positive test, predictive value of negative test, percentage of false positives and percentage of the negative was calculated.

Results

Table 1: Demographic data

Age groups in years	Number	Percentage
20-30	6	3
31-40	38	19
41-50	68	34
51-60	46	23
>60	42	21
Parity		
Parity 1	4	2
Parity 2	44	22
Parity 3	56	28
Parity 4	50	25
Parity 5	16	8
Parity 6	14	7
Parity 7	14	7
Parity 8	2	1
Complaint		
White discharge	124	62
Post-coital bleeding	32	16
Irregular cycles	24	12
Intermenstrual bleeding	24	12
Asymptomatic	16	8
Pain in abdomen	12	6
Postmenopausal bleeding	12	6
Dyspareunia	2	1
Other complaints	8	4
Per vaginum		
Bulky uterus	120	60
Normal	80	40

In this study, 34% women belong to age group 41-50 years. 23% women belong to 51-60 years of age. 3% women belong to 20-30 years of age, 19% women belong to 31-40 years of age and 21% women are more than 60 years of age. In this study there were 2 % with parity 1, 22% with parity 2, 28% with parity 3, 25% with parity 4, 8% with parity 5, 7% with parity 6, 7% with parity 7 and 1% with parity 8. In this study population, majority 62% presented with white discharge, 16% presented with post-coital bleeding, 12% each of irregular cycles and intermenstrual bleeding, 8% were asymptomatic, 6% each presented with pain in abdomen and postmenopausal bleeding, 1% presented with dyspareunia and 4% presented with other complaints. In present study the per vaginum findings 60% bulky uterus was seen while in 40% women it was normal.

Table 2: Distribution according to PAP smear findings

PAP smear findings	Number	Percentage
Inflammatory	160	80
LSIL	2	1
HSIL	4	2
ASCUS	30	15
Vaginosis	4	2
Total	200	100

In this study, PAP smear has showed maximum 80% women having inflammatory, in 1% it showed LSIL, in 2% HSIL was the finding, in 15% it showed ASCUS and in 2% findings were suggestive of bacterial vaginosis.

Table 3: Distribution according to colposcopy findings

Colposcopy findings	Number	Percentage
Aceto white area	66	33
Metaplasia	72	36
Mosaic pattern	12	6
Punctate	14	7
Abnormal vascularity	20	10
Polyp	10	5
Growth	6	3
Total	200	100

In this study, authors found that colposcopy showed 33% acetowhite area, 36% metaplasia, 6% mosaic, 7% punctuate, 10% abnormal vascularity, 5% polyp, and in 3% the findings were suggestive of polyp/growth.

Table 4: Distribution according to histopathology report

Histopathology findings	Number	Percentage
Chronic cervicitis	168	84
CIN-1	6	3
Carcinoma in situ	6	3
Well differentiated SCC	2	1
Moderately differentiated SCC	16	8
Neuro endocrine tumor's	2	1
Total	200	100

In this study, we found that histopathological findings showed in 84% chronic cervicitis, 3% it was CIN-1, in 3% chronic cervicitis with carcinoma in situ, 1% well differentiated squamous cell carcinoma, in 8% it was moderately differentiated squamous cell carcinoma and in 1% features were suggestive of neuroendocrine tumors.

Table 5: Sensitivity

PAP smear	%
Sensitivity	52%
Specificity	85.5%
Positive predictive value	38.8%,
Negative predictive value	92.5%
Colposcopy smear	
Sensitivity	95.5%
Specificity	38.52%
Positive predictive value	21.62%,
Negative predictive value	97.53%

The sensitivity of Pap smear was 52%, specificity was 85.5%, Positive predictive value (PPV) 38.8%, and negative predictive value was 92.5%. The sensitivity of coloposcopy smear was 95.5%, specificity was 38.52%, Positive predictive value (PPV) 21.62%, negative predictive value was 97.53%.

Discussion

It is estimated that at least 10-15% of women have at least one episode of Pelvic Inflammatory Disease (PID) in their lifetime. [13] Most of the patients in gynaecology Out Patient Department (OPD) who complain of white discharge per vagina and pain in

the lower abdomen are usually diagnosed with vaginitis or PID. [13] Cervical cancer accounts for 26.1-43.8% of all cancers in Indian women. [14] The major aetiological agent of cervical cancer, the human papillomavirus (HPV), has a long latent precancerous phase. HPV spreads with agents, resulting in PID with symptoms and compelling the patient to seek medical attention. Early identification and treatment at its preinvasive stage may benefit the patients, by decreasing the burden of morbidity and mortality resulting from cervical cancer. [15]

In this study, 34% women belong to age group 41-50 years. 23% women belong to 51-60 years of age. 3% women belong to 20-30 years of age, 19% women belong to 31-40 years of age and 21% women are more than 60 years of age which was inconsistent with study of Indu et al [16], Kalyankar et al [17], Shaki et al [18] and Thobbi et al [19] where maximum patients were in the age group of 31-40 years. This could be attributed to the higher age at which are patients came symptomatically and presented with complains to warrant screening at OPD. In this study population, majority 62% presented with white discharge, 16% presented with post-coital bleeding, 12% each of irregular cycles and intermenstrual bleeding, 8% were asymptomatic, 6% each presented with pain in abdomen and postmenopausal bleeding, 1% presented with dyspareunia and 4% presented with other complaints. Similar to studies done by various authors where white discharge was most common presenting complaint Ramesh et al [20], Vermaet al [16], Kaveri et al. [21]

In this study there were 2 % with parity 1, 22% with parity 2, 28% with parity 3, 25% with parity 4, 8% with parity 5, 7% with parity 6, 7% with parity 7 and 1% with parity 8. In present study the per vaginum findings 60% bulky uterus was seen while in 40% women it was normal. In this study, PAP smear has showed maximum 80% women having inflammatory, in 1% it showed LSIL, in 2% HSIL was the finding, in 15% it showed ASCUS and in 2% findings were suggestive of bacterial vaginosis. Similar findings were seen in study by Ashmita et al [22], 82.7% women had normal (or inflammatory) pap smear while 3.8 % had HSIL which was consistent with our study.

In this study, authors found that colposcopy showed 33% acetowhite area, 36% metaplasia, 6% mosaic, 7% punctuate, 10% abnormal vascularity, 5% polyp, and in 3% the findings were suggestive of polyp/growth. In this study, we found that histopathological findings showed in 84% chronic cervicitis, 3% it was CIN-1, in 3% chronic cervicitis with carcinoma in situ, 1% well differentiated squamous cell carcinoma, in 8% it was moderately differentiated squamous cell carcinoma and in 1% features were suggestive of neuroendocrine tumors.

The sensitivity of Pap smear was 52%, specificity was 85.5%, Positive predictive value (PPV) 38.8%, and negative predictive value was 92.5%. The sensitivity of coloposcopy smear was 95.5%, specificity was 38.52%, Positive predictive value (PPV) 21.62%, negative predictive value was 97.53%. %. In the study by Ashmita et al [22], overall pap smear had a poor, sensitivity compared to colposcopy 19.5% Vs. 90.24% respectively.20 In the Study by Suguna [23], sensitivity of colposcopy was 95%, specificity was 60%, FNV- 2%.

Conclusion

Colposcopy is definitely more sensitive and accurate than pap smear. By combining Pap smear with colposcopy, we can maximize the sensitivity and specificity of cancer cervix screening.

References

1. MM Dasari V Anem S Gunta SK Seeram B Atla Comparative study of effectiveness of Pap smear versus visual inspection with acetic acid for mass screening of lesions of cervixInt J Res Med Sci20186620428.
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: a cancer journal for clinicians. 2021 May;71(3):209-49.
3. Globocan2020International Agency for Research on Cancer.
4. Sreedevi A, Javed R, Dinesh A. Epidemiology of cervical cancer with special focus on India. International journal of women's health. 2015 Apr 16:405-14.
5. 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 journal of cancer. 2007 Apr 1; 44(2):51-5.
6. Peto J, Gilham C, Fletcher O, Matthews FE. The cervical cancer epidemic that screening has prevented in the UK. The Lancet. 2004 Jul 17;364(9430):249-56.
7. Cohn DE, Herzog TJ. New innovations in cervical cancer screening. Clinical Obstetrics and Gynecology. 2001 Sep 1;44(3):538-49.
8. Verma A, Verma S, Vashist S, Attri S, Singhal A. A study on cervical cancer screening in symptomatic women using Pap smear in a tertiary care hospital in rural area of Himachal Pradesh, India. Middle East Fertil Soc J. 20 17;22(1):39-42.
9. Nkwabong E, Laure Bessi Badjan I, Sando Z. Pap smear accuracy for the diagnosis of cervical precancerous lesions. Trop Doct. 201 9;49(1):34-39.

10. Pangarkar MA. The Bethesda System for reporting cervical cytology. Cyto Journal. 2022;19:28.
11. Burness JV, Schroeder JM, Warren JB. Cervical colposcopy: Indications and risk assessment. Am Fam Physician. 2020;102(1): 39-48.
12. Wojciech R. The diagnostic value of cytology and colposcopy in women with cervical intraepithelial neoplasia]. Ginekol Pol. 2011; 82(8):607-11.
13. Mitchell C, Prabhu M. Pelvic inflammatory disease. Infect Dis Clin North Am. 2013;27(4):793-09.
14. Joshi S, Ghike S, Bhalerao A, Kawthalkar A, Kulkarni S. Correlation of pap smear, colposcopy and histopathology in women with unhealthy cervix. J South Asian Fed Obstet Gynaecol. 2012;4(2):97-98.
15. Kuramoto H, Sugimoto N, Iida M. Screening for cancer of the cervix with simultaneous pap smear and colposcopy. The efficacy of pap smear and colposcopy. Eur J Gynaecol Oncol. 2011;32(1):73-76.
16. Verma I, Jain V, Kaur T. Application of bethesda system for cervical cytology in unhealthy cervix. J Clin Diagn Res. 2014; 8(9): OC26-30.
17. Kalyankar VY, Kalyankar BV, Gadappa SN, Kute S. Colposcopic evaluation of unhealthy cervix and it's correlation with Papanicolau smear in cervical cancer screening. Int J Reprod Contracept Obstet Gynecol. 2017;6:49 59-65.
18. Shaki O, Chakrabarty BK, Nagaraja N. A study on cervical cancer screening in asymptomatic women using Papanicolaou smear in a tertiary care hospital in an urban area of Mumbai, India. J Fam Med Prim Care. 2018;7(4):652.
19. Thobbi VA, Khan F. Cervical cytology by Pap smear in reproductive population. Int J Reprod Contracept Obstet Gynecol. 2018;7:1988-92.
20. Ramesh G, Sudha R, Jayashree AK, Padmini J. Colposcopic evaluation of the unhealthy cervix. J Clin Diagnost Res. 2012;6(6):1026-28.
21. Kaveri SB, Khandelwal S. Role of Pap smear N cervical biopsy in unhealthy cervix. J Sci Innovat Res. 2015;4(1):4-9.
22. Ashmita D, Shakuntala PN, Rao SR, Sharma SK, Geethanjali S. 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(5):50-9.
23. Suguna M, Rajeshwar A, Pasula S. A study on pap smear and colposcopy in unhealthy cervix in women. Int J Med Sci Public Health. 2014; 3(7):889-91.