Research Article

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EVALUATION OF PRE-INVASIVE LESIONS ASSOCIATED WITH CERVICAL CARCINOMA USING A VARIETY OF SCREENING METHODS- A COMPARATIVE STUDY

Dr. Lomate Shahaji Bhratrao,[1] Dr. Jogi Bhaskar Patra[2*]

[1] Assistant Professor, Department of Community Medicine, Rama Medical College, Hapur, Uttar Pradesh
[2*] Associate Professor, Department of Community Medicine, Rama Medical College, Hapur, Uttar Pradesh

Corresponding Author
Dr. Jogi Bhaskar Patra

Email Id: docjogibhaskar@gmail.com

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ABSTRACT

Background: Cancer screening is easy to do and may be done in pre-invasive stages, which enables surgery or chemoradiotherapy to treat these lesions in a conservative and efficient manner.

Aim: Examining the various methods for detecting and screening pre-invasive lesions of cervical cancer, such as colposcopy, pap smear, visual cervix examination with iodine and acetic acid, and visual cervix examination with Lugol's iodine, was the aim of the current study.

Methods: After obtaining a medical history, eighty females ranging in age from twenty to sixty underwent a pap smear, acetic acid, Lugol's iodine cervix inspection, and colposcope. After the collected data were statistically analysed, conclusions were drawn with a significance level of 0.05.

Results: According to Lugol's iodine and acetic acid with a visual examination, pap smear, and colposcopy, only 2.5% (n=2) of the subjects had a cervix free of abnormalities, while 56.25% (n=45) of the female subjects had cervicitis, 22.5% (n=18) of the subjects had Intraepithelial carcinoma-1, 16.25% (n=13) of the subjects had Intraepithelial carcinoma-2/3, and 2 (2.5%) of the subjects had microinvasive carcinoma that was confirmed.

Conclusion: The study concludes that the combination of pap smear cytology, ocular inspection, and colposcopy enhances the probability of detecting invasive and pre-invasive lesions.

Keywords: colposcopy, pap smear, cervical cancer, cerclage,

INTRODUCTION

Globally, cervical cancer is becoming increasingly frequent; yet, due to limited access to healthcare, it is more common (about 88%) in poorer countries. Cervical cancer is the second most prevalent cause of death for women globally, with the majority of occurrences occurring in Asia. Aizwal and Thiruvananthapuram have the highest rates of cervical cancer in the world, with 8.8 and 22.5/1000 females affected, respectively. This puts a great deal of strain on the sufferers.1

Invasive cervical carcinoma is seen as a preventable condition because of the protracted pre-invasive phase, during which the cancer underwent a number of events, such as cellular atypia, dysplasia, and/or intraepithelial neoplasia (CIN), before developing into an invasive form.

The straightforward and potentially pre-invasive nature of cervical cancer screening allows for the conservative and efficient treatment of these lesions with chemotherapy, radiation therapy, or surgery. An ideal screening method should be reasonably priced, scarcely noticeable, easy to use, successful, and acceptable.2

The gold-standard Pap cytology smear is just one method of screening for cervical cancer and precancerous lesions. Its use is however limited by technical limitations, even if they can facilitate early identification and

screening efficacy in high-risk females.3. Early neoplastic changes can be detected by abnormal Pap smears; the sensitivity ranges for CIN 2 and 3 are 47 to 62% and 60 to 95%, respectively.

The PAP smear detects around 30% of newly reported cases annually, but it has several limitations that might lead to mistakes in collection, fixation, and interpretation. As a result, cases may go unnoticed. Only 5% of cases detected in the early stages are found in India, which accounts for 16% of all cases globally. Downstaging is an additional strategy for the early detection and referral of malignant and premalignant lesions to more advanced centres for treatment and education of female patients regarding the course of the illness, symptoms, prophylaxis, and risk factors.4

An further examination method for assessing the lower genital tract that can help differentiate between normal (benign) and abnormal—and raise suspicions about pre-invasive and invasive abnormalities—is colposcopic examination using a Colposcope.

Because it is the gold standard, non-invasive, and helps identify the optimal sites for biopsies, colposcopy is favoured over cytology and Pap smears. Indian females remain oblivious to the symptoms and risks of cervical cancer due to a lack of resources, knowledge, awareness, psychological issues, and a lack of receptiveness to screening. A woman's degree of information about cervical cancer determines her likelihood of being screened.5. The current experiment was carried out to investigate the various methods for detecting and screening pre-invasive lesions of cervical cancer, such as pap smear, visual cervix examination with acetic acid, visual cervix examination with Lugol's iodine, and colposcopy.

MATERIALS AND METHODS

The present cross-sectional study was carried out by the department of obstetrics and gynaecology at the institution. The study included 80 females in the 20–60 age range, with a mean age of 32.6 years, based on inclusion and exclusion criteria.

The study's inclusion criteria were females who were 18 years of age or older and attended an institutional outpatient department; they had to be free of any other systemic problems; they had to be non-users of long-term medication; they had to provide their assent; and they had to be willing to be followed up on. Exclusions from the research were those who were between the ages of 20 and 60, pregnant, had had a hysterectomy in the past, refused to participate, had been diagnosed with serious cancer, and had never engaged in sexual activity before.

The present cross-sectional study was carried out by the department of obstetrics and gynaecology at the institution. The study included 80 females in the 20–60 age range, with a mean age of 32.6 years, based on inclusion and exclusion criteria. Women who were sexually active at the time of selection or in the past were chosen, and the purpose of the screening was explained once agreement was obtained. After discussing the test results with the participants, therapy options were discussed if needed. Following patient inclusion, past cervix surgeries, menstrual histories, and obstetric data were documented. The patients were given their medical histories, then they were put in the dorsal position and a lubricant-free speculum was used to check for pathology.

The borders, opacity, and thickness of the acetowhite zones were visually assessed 60 seconds after the application of 5% acetic acid. After applying Lugol's iodine, the area was observed for 60 seconds to see if the colour had changed. The squamous epithelium becomes black or mahogany brown in a healthy cervix, leaving the columnar epithelium unaltered. Pap smears were obtained via the posterior fornix and the scarring squamocolumnar junction following visual examination using an ayre's spatula. After that, these samples were mounted on slides using ethyl alcohol and ether. After a histological examination of the smears, results were obtained using the modified Bethesda method. During the colposcopic examination, Lugol's iodine, acetic acid, green filter, and regular saline were employed.

The findings were predicted using the Modified Reid Colposcopic Index (RCI), which is utilised for reference indicators such as margin, vascular pattern, iodine reaction, and margins, with a score of 0–2. The following is the scoring scheme: Low-grade disease (0–2) (CIN1 or HPV) 3–4 indicates an intermediate-grade illness (CIN1– II). Grades 5-8 indicate a high-grade illness (CIN II–III).

Using SPSS software version 21.0, 2012, Armonk, NY, the acquired data were statistically evaluated, and the findings were formed with a significance threshold of $p < 0.05$.

RESULTS

With a mean age of 32.6 years, the research comprised 80 female participants in the 20–60 age range. Table 1 lists the additional obstetric and demographic details of the research participants.

Female study participants were most prevalent in the age category of 31–40 years (n = 38.75%), followed by 41–50 years (n = 27.5%), and 51–60 years (n = 10), which had the lowest percentage of participation. Regarding parity, every participant had one (35%, n = 28) or more (65%, n = 52). The family planning methods used by research participants were oral contraceptives, Laparoscopic tubectomy, abdominal tubectomy, and Copper-T in the following proportions: 46.25% (n=37), 11.25% (n=9), 7.5% (n=6), and 1.25% (n=1), while 33.75% (n=27) of the females did not use any form of contraception. The most prevalent complaint among the 66 female

research participants was white discharge, which was followed by post-coital bleeding (2.5%), uterine bleeding (11.25%; n = 9), and post-menopausal haemorrhage (3.75%; n = 3).

Based on the several screening methods employed in this study, a visual inspection using Lugol's iodine and acetic acid showed that 47.5% (n=38) and 48.75% (n=39) of females, respectively, produced positive findings. Normal, erosion/inflammation, CIN 1, CIN 2/3, and unsatisfactory were seen in 7.5% (n = 6), 51.25% (n = 41), 13.75% (n = 1), 21.25% (n = 17), and 6.25% (n = 5) of the people, respectively, based on the results of the colposcopy. Squamous metaplasia, a negative intraepithelial lesion, and a negative intraepithelial lesion were the results of the Pap test. The study females that had the following results: 3.75% (n=3), 2.5% (n=2), 72.5% (n=58), 6.25% (n=5), 11.25% (n=9), and 1.25% (n=1) had inflammatory, low grade, high grade, and atypical squamous cells of uncertain significance. 2.5% (n=2) of the individuals had squamous cell carcinoma. As shown in Table 2, Pap smear findings for research participants showed the presence of trichomonas vaginalis, candida species, squamous metaplasia, and/or inflammatory lesions.

In terms of overall diagnosis and screening (Table 3), it was found that whereas 56.25% (n=45) of the female subjects had cervicitis, 22.5% (n=18) of the subjects had intraepithelial carcinoma-1, 16.25% (n=13) of the subjects had intraepithelial carcinoma-2/3, and 2 (2.5%) of the subjects had confirmed Micro invasive carcinoma. 2.5% of the subjects had a cervix free of abnormalities. Table 4 presents the results of the current study's comparison analysis of the diagnostic accuracy of different screening modalities. Of the 32 cases with colposcopy positive, 15 were not found to have been identified by a pap smear.

Furthermore, 10 of the 48 negative colposcopic cases were unidentifiable by pap smear, indicating that they could distinguish between false-positive and false-negative results. Five instances out of 48 negative cases and eleven cases out of 32 positive cases in the ocular Lugol's iodine testing were overlooked.

DISCUSSION

Age groups 31–40 years old (n = 31) and 41–50 years old (n = 22) had the largest percentage of female participants in the current study, whereas age groups 51–60 years old (n = 10) had the lowest percentage of participation. Regarding parity, every participant had one (35%, n = 28) or more (65%, n = 52).

The family planning methods used by research participants were oral contraceptives, Laparoscopic tubectomy, abdominal tubectomy, and Copper-T in the following proportions: 46.25% (n=37), 11.25% (n=9), 7.5% (n=6), and 1.25% (n=1), while 33.75% (n=27) of the females did not use any form of contraception. The most prevalent complaint among the 66 female research participants was white discharge, which was followed by post-coital bleeding (2.5%), uterine bleeding (11.25%; n = 9), and post-menopausal haemorrhage (3.75%; n = 3). These findings were in line with those of Mehta A et al. (2013) and Geethalakshmi U et al. (2014), who discovered that the research participants had comparable demographic and obstetric traits.

Lugol's iodine and acetic acid were used for visual inspection, and the results showed that 47.5% (n=38) and 48.75% (n=39) of the female subjects showed favourable results. Normal, erosion/inflammation, CIN 1, CIN 2/3, and unsatisfactory were seen in 7.5% (n = 6), 51.25% (n = 41), 13.75% (n = 1), 21.25% (n = 17), and 6.25% (n = 5) of the people, respectively, based on the results of the colposcopy. The study females that had the following results: 3.75% (n=3), 2.5% (n=2), 72.5% (n=58), 6.25% (n=5), 11.25% (n=9), and 1.25% (n=1) had inflammatory, low grade, high grade, and atypical squamous cells of unknown significance. 2.5% (n=2) of the individuals had squamous cell carcinoma. These results were in line with those of Ghosh P et al. (2012) about pap smears, Garg P et al. (2011) regarding acetic acid and Lugol's Iodine, and Richa D et al. (2014) with colposcopic exams.

Only 2.5% (n=2) of the patients had an unabnormal cervix, compared to 56.25% (n=45) of the female subjects who had cervicitis, 22.5% (n=18) of the subjects who had intraepithelial carcinoma-1, 16.25% (n=13) of the subjects who had intraepithelial carcinoma-2/3, and 2 (2.5%) of the subjects who had microinvasive carcinoma that was verified. Awasthy S et al.'s 2012 study's findings likewise revealed a comparable prevalence of these lesions in the participants.

Table 4 presents the results of a comparative analysis on the diagnostic efficacy of various screening procedures. It was determined that 15 of the 32 positive cases by colposcopy were not detected by a pap smear. Additionally, they were able to identify false-positive and false-negative results since 10 of the 48 patients with negative colposcopic results were misdiagnosed by pap smear. Eleven out of thirty-two positive cases and five out of forty-eight negative cases in the ocular Lugol's iodine test went undetected. Our results were an addition to the studies conducted by Kushtagi P et al. in 2002 and Gopal M et al. in 2013, which showed that different screening procedures had equivalent diagnostic efficacy.

CONCLUSION

Within its constraints, the current study draws the conclusion that when used together, pap smear cytology, visual inspection, and colposcopy have a better detection probability of pre-invasive and invasive lesion than when used alone. White discharge was the most often reported presenting complaint. Multiparous females had a

significant incidence of intraepithelial cancer. Therefore, these procedures should be used in the normal cervical examination to identify and treat pre-invasive lesions early on, before they develop into cancer. The study did, however, have a few drawbacks, including geographic region bias, a small sample size, a cross-sectional design, and a brief observation time. To draw a firm conclusion, further longitudinal studies with a longer monitoring time and a bigger sample size are needed.

REFERENCES

1. M Arbyn, E Weiderpass, L Bruni, et al. Estimates of incidence and mortality of cervical cancer in 2018: a worldwide analysis. Lancet Glob Health. 2019;8:191-203

2. Mello V, Sundstrom RK. Cancer, Cervical Intraepithelial Neoplasia (CIN) Treasure Island, FL: StatPearls Publishing; 2019.

3. Fontham E.T.H., Wolf A.M.D., Church T.R. Cervical cancer screening for individuals at average risk: 2020 guideline update from the American Cancer Society [published online ahead of print, 2020 Jul 30] CA Cancer J Clin. 2020 doi: 10.3322/caac.21628.

4. Saslow D, Solomon D, Lawson HW, Killackey M, Kulasingam SL, Cain J, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. CA Cancer J Clin 2012;62:147–72.

5. Belinson JL, Pretorius RG, Zhang WH, Wu LY, Qiao YL, Elson P. Cervical cancer screening by simple visual inspection after acetic acid. Obstet Gynecol. 2001;98:441-4.

6. Mehta A, Ladola H, Kotadiya K, Edwin R, Patel V, Patil V. Study of high-risk cases for early detection of cervical cancer by PAP's smear and Visual inspection by Lugol's iodine method.NHL Journal of Medical sciences. 2013;2:1.

7. Geethalakshmi U, Narasimha Murthy S, Prabhu D. cervical cytology (the Bethesda system) and colposcopic guided biopsy correlation in neoplastic cervical lesions. J of Evidence-Based Med & Hlthcare. 2014;1:876.

8. P. Ghosh, G. Gandhi, P.K. Kochhar, V. Zutshi & S. Batra Visual inspection of cervix with Lugol's iodine for early detection of premalignant & malignant lesions of cervix, Indian J Med Res. 2012;136:265-71.

9. Garg P . Evaluation of Visual Inspection with Acetic Acid (Via) & Visual Inspection with Lugol's Iodine (Vili) as a Screening Tool for Cervical Intraepithelial Neoplasia in Comparison with Cytologic Screening.WebmedCentral Obstetrics And Gynaecology. 2011;2:1971.

10. Richa D. Chaudhary, Saunitra A. Inamdar, Chella Hariharan. Correlation of diagnostic efficacy of unhealthy cervix by cytology, colposcopy, and histopathology in women of rural areas, Int J Reprod Contracept Obstet Gynecol. 2014;3:213-8.

11. Aswathy S., Mariya Amin Quereshi, Beteena Kurian & Leelamoni K. Cervical cancer screening: Current knowledge & practice among women in a rural population of Kerala, India.Indian J Med Res 136, August 2012;136:205-10.

12. Kushtagi P, Fernandez. P, Significance of Persistent Inflammatory, Cervical smears in Sexually active women of reproductive age. The Journal of Obs and Gyn. of India. 2002;2:124-6.

13. M. Gopal, Prashant. S. Joshi, Ravindra Pukale, Shamashoor. "Colposcopic findings in Unhealthy Cervix and its comparison with Cytology and Histopathology". Journal of Evolution of Medical and Dental Sciences 2013;2:4663-71.

TABLES

Characteristics	Subgroup	%	N
Age range	20-30 years	21.25	17
	31-40 years	38.75	31
	41-50 years	27.5	22
	51-60 years	12.5	10

Parity	Mean Age		32.6
Parity	Nullipara	0	0
	1	0	0
	2	35	28
	More than 2	65	52
Methods of family planning	None	33.75	27
	Abdominal tubectomy	46.25	37
	Oral contraceptives	1.25	1
	Laparoscopic tubectomy	11.25	9
Chief complaint	Post-menopausal bleeding	2.5	2
	White discharge	82.5	66
	Uterine bleeding	11.25	9
	Post-coital bleeding	3.75	3

Table 1: Demographic and Obstetrics characteristics of the study subjects

Screening methods	Subgroup	Lugol's Iodine Positive	Lugol's Iodine Negative	Acetic acid positive	Acetic acid Negative
Visual Examination	Normal	0	2	0	2
	Cervicitis	5	39	5	39
	Intraepithelial carcinoma-1	18	0	18	0
	Intraepithelial carcinoma-2/3	13	1	14	0
	Micro invasive carcinoma	2	0	2	0
	Total	38 (47.5)	42 (52.5)	39 (48.75)	41 (51.25)
		%		**N**	
Pap smear	Negative for intraepithelial lesion	3.75		3	
	Negative for intraepithelial lesion, squamous metaplasia	2.5		2	
	Inflammatory	72.5		58	
	low-grade squamous intraepithelial lesion	6.25		5	
	high-grade squamous intraepithelial lesion	11.25		9	
	atypical squamous cells of undetermined significance	1.25		1	
	Squamous cell carcinoma	2.5		2	
Colposcopy	Normal	7.5		6	
	Erosion/Inflammation	51.25		41	
	Hazy acetowhite areas, fine punctations or mosaicism, iodine partial positivity (CIN 1)	13.75		11	
	Dense acetowhite areas, coarse punctations or mosaicism, iodine negative epithelium (CIN 2/3)	21.25		17	
	Unsatisfactory	6.25		5	

Table 2: Screening methods employed in study subjects

Characteristics	N	%
Normal	2	2.5
Cervicitis	45	56.25
Intraepithelial carcinoma-1	18	22.5
Intraepithelial carcinoma-2/3	13	16.25
Micro invasive carcinoma	2	2.5

Table 3: Distribution of Pre-invasive and invasive lesions in study subjects

Parameter	Subgroup	N	Colposcopy	
			Positive	Negative
Pap	Negative	54	15	38
	Positive	26	17	10
Visual Lugol's iodine	Negative	42	4	38
	Positive	38	28	10

| Visual acetic acid | Negative | 41 | 5 | 37 |
| | Positive | 39 | 27 | 11 |

Table 4: Diagnostic efficacy of various screening methods employed in the study