Original Article

A Study on Cervical Cancer Screening Using Pap Smear Test and Clinical Correlation

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ABSTRACT

Objective: The objective of the study is to evaluate the use of the Pap smear screening method for detection of precancerous lesions. **Methods:** All women who visited the outpatient gynecology clinic of the Department of Obstetrics and Gynaecology at King Georges Medical University, Lucknow, UP, India, over 1 year for different clinical problems were recruited for the study. A total of 1650 women who were sexually active and over 21 years of age were enrolled in the study. A clinical examination, an examination per speculum, and a vaginal examination were performed and a history taken for all women. A Pap smear was used for all women to screen for cervical cancer. The smear was obtained using an Ayre spatula and spread over a marked glass slide, which was placed in 95% ethyl alcohol and sent to the Department of Pathology for cytopathological examination. All data were recorded using a predetermined pro forma. Women who had visible malignant cervical lesions were excluded from the study. **Results:** Most women were in the age range of 30–50 years and multiparous. Vaginal discharge was the most common complaint, occurring in 36.96% of the women. An irregular menstrual cycle was the complaint of 12.78% and abdominal pain of 25.63% of women, while 15.15% were asymptomatic. The Pap smear test of 93.57% of the women was adequately taken, while 6.42% of the individuals had an inadequate sample. The test was negative for malignancy in 48.84%, and 42.66% had infection or inflammation. Atypical squamous cells of undetermined significance (ASCUS), low-grade squamous intraepithelial lesion (LSIL), and high-grade squamous intraepithelial lesion (HSIL) were detected in 2.90%, 5.09%, and 0.48%, respectively. Women with Pap tests positive for ASCUS, LSIL, and HSIL underwent a colposcopy and guided biopsy. **Conclusions:** Women with an abnormal Pap test should undergo a colposcopy, and those with abnormal colposcopy findings should be advised to undergo a biopsy. A Pap smear is simple, noninvasive, cost-effective, and easy to perform for detection of precancerous lesions in a gynecological patient.

Key words: Cervical malignancy, HPV DNA testing, Pap smear

Introduction

Cancer of the cervix is an increasing health problem and an important cause of mortality in women worldwide. The incidence of cervical cancer arises worldwide. The difference in incidence between developing and developed countries, where cervical cancer cases have been significantly reduced, is large. In developing countries like India, the burden of cervical cancer is still high. According to the World Cancer statistics, >80% of all the cervical cancer cases are found in developing and low-resource countries, because of a lack of awareness and difficulty in running cytology-based screening programs.[1] More than one-fifth of all cervical cancer deaths occur in India.[2] Every year, 122,844 women in India are diagnosed with cervical cancer, and 67,477 women die from the disease.[3]

Cervical cancer is a preventable disease due to the long preinvasive stage. Early detection and appropriate treatment are possible if robust screening is implemented.[4] Early cervical epithelial changes can be identified by a Pap smear test, which is the primary screening test for detection of precancerous cervical intraepithelial neoplasia and the early stage of invasive cervical cancer.

Due to widespread screening programs, there has been a significant reduction in mortality from cervical cancer in developed countries.

The overall sensitivity of the Pap test in detecting a high-grade squamous intraepithelial lesion (HSIL) is 70.80%.[5] A Pap screening done in association with an HPV DNA test increases the sensitivity for early detection of precancerous lesions.[6]

There is a need to spread cervical cancer screening awareness programs, educate women regarding the symptoms of cancer, and motivate them to visit the hospital for a cancer screening. Women and all family members should be counseled about the need for cancer screening. Pap smear-positive women need adequate treatment and regular follow-up. Thus, we have to strengthen our health services and health-care system to include screening at primary health centers.

The aim of the present study was to evaluate women for precancerous lesions using the Pap smear test and investigate clinical correlation.

Methods

This prospective study was carried out over 1 year at the Department of Obstetrics and Gynaecology in Queen Mary's Hospital, part of King George Medical University, Lucknow, India. We screened 1650 sexually active women who were more than 21 years of age. Women with different complaints, including vaginal discharge, blood-mixed discharge, foul-smelling discharge, postcoital bleeding, intermenstrual bleeding, postmenopausal bleeding, abdominal pain, infertility, and secondary amenorrhea, were included in this study. Those not willing to participate in the study had a frank growth, had been treated for cervical cancer, or were pregnant were excluded from the study. A detailed history was taken using a predetermined pro forma that included the chief complaint and the findings of per speculum and vaginal examinations.

Written informed consent was obtained from all women. Patients were placed in the lithotomy position, and a sterile bivalve speculum was inserted into the vagina. The posterior vaginal wall was retracted posteriorly and the anterior vaginal wall anteriorly to allow proper visualization of the cervix and vaginal wall.

A sample was taken from the ectocervix by rotating a wooden Ayre spatula 360°. The sample was quickly smeared onto a labeled glass slide and fixed with 95% ethyl alcohol in a jar. The glass slides were sent to the Department of Pathology for cytopathological examination. Laboratory results were reported according to the new Bethesda System for Reporting Cervical Cytology 2014. The system broadly divides lesions into those negative for intraepithelial neoplasia and epithelial cell abnormalities (ECA) that include squamous and glandular cells.

Women who had abnormal Pap test results, including atypical squamous cells of undetermined significance (ASCUS), low-grade squamous intraepithelial lesion (LSIL), and HSIL were sent for a colposcopic examination. Women who had an abnormal colposcopic finding, i.e., a Reid score 6 or above, underwent a colposcopy-guided biopsy. Treatment was provided according to the stage of the disease.

Results

In this study, most women (54) with LSIL belonged to the 41–50-year-old age group, followed by 17 women who belonged to the 51–60-year-old age group. HSIL was found mostly in women 41–50 years of age [Table 1]. Most women with LSIL had four or more children. This indicates that multiparity (>3) is a significant risk factor for cervical carcinoma.

Most women in the study were Hindu, not Muslim. May be fewer Muslim women came to the hospital because of their religion, shyness, or they were unaware of the cervical cancer screening program. Most women belonged to rural communities versus urban areas because the government runs the cervical cancer screening awareness program in rural areas [Table 1].

White vaginal discharge was the most common symptom found in 36.96%, abdominal pain in 25.63%, an irregular menstrual cycle in 12.78%, postcoital bleeding

in 3.09%, and postmenopausal bleeding in 1.45% of the women [Table 2].

Table 3 shows that on perspeculum examination white discharge was commonly found in 29.69% of the participants, cervical erosion was present in 19.21%, hypertrophy of the cervix was found in 10.84%, and cervical bleeding on touch was found in 4.84%. Cases with chronic cervicitis and cervical bleeding on touch had epithelial abnormalities.

Table 4 shows that 48.84% of the participants were negative for malignancy and 42.66% had inflammation. The epithelial abnormalities ASCUS, LSIL, and HSIL were found in 2.90%, 5.09%, and 0.48% of the women, respectively. Unsatisfactory reporting occurred for 6.42%, while the remainder had adequate sample reporting.

The results in Table 5 show that the most abnormal Pap smear findings were found in patients with symptoms of white vaginal discharge, followed by patients with

abdominal pain. No LSIL and HSIL was found for patients with postcoital bleeding, and HSIL was found in only two patients with postmenopausal bleeding.

Discussion

The incidence of cervical cancer is quite high because prevention programs are either nonexistent or poorly implemented. The Pap smear test used as a screening method to detect cervical cancer is an effective way to prevent the development of cervical cancer, but awareness within the community about the Pap smear test is very low. According to the American Cancer Society (2012), the Pap smear test is a routine cancer screening method that should be done every 3 years, and a Pap smear with an HPV DNA test is recommended as a screening method every 5 years.[7]

In the present study, most of the abnormal cytology was detected in patients in the age group between 40 and 60 years. LSIL and HSIL were found in 5.09% and 0.48% of the women in this age group, respectively. Gupta *et al.*[8] reported that most of the abnormal cytology cases, i.e., 40.37%, in their study were in the age group of 30–39 years, followed by 35.96% in the age group of 20–29 years. LSIL was found in 1.36% (age group of 30–39 years) and HSIL in 0.91% (age group of 40–49 years). Vaghela *et al.*[9] reported that LSIL was the most common epithelial abnormality, found in 12.4% of their individuals, followed by HSIL in 5% of the cases. For all epithelial abnormalities, the average age of the women was 49 years.

Table 1: Demographic Profile of patients				
	Negative for malignancy (*n*=806)	Inflammation (*n*=704)	ASCUS (*n*=48)	LSIL (*n*=84)	HSIL (*n*=8)
Age (years)					
21-30	210	251	0	2	0
31-40	291	201	4	8	2
41-50	151	107	18	54	5
51-60	100	103	20	17	1
61-70	50	36	6	3	0
>71	4	6	0	0	0
PARITY					
P1+0	210	170	0	0	0
P2+0	130	184	4	5	3
P3+0	147	146	6	26	1
P4+0	180	138	30	37	2
P5+0	78	60	8	14	2
>P5+0	61	6	0	2	0
Religion	No.	%			
Hindu	1160	70.30			
Muslim	490	29.69			
Socioeconomic status					
Rural	930	56.36			
Urban	720	43.63			

Table 3: Per speculum examination findings of gynaecological cases		
Finding	*n*=1650	%
Healthy looking cervix	430	26.06
White discharge per vaginum	490	29.69
Hypertrophied cervix	179	10.84
Cervical erosion	317	19.21
Ectropion of cervix	98	5.93
Bleed on touch cervix	80	4.84
UV prolapse/cystocele	56	3.39

Table 2: Symptoms of women attending gynaecological outdoor		
Symptoms	*n*=1650	%
Asymptomatic	250	15.15
White discharge per vaginum	610	36.96
Pain in abdomen	423	25.63
Postcoital bleeding	51	3.09
Irregular cycle	211	12.78
Postmenopausal bleeding	24	1.45
Something coming out through per vaginum	56	3.39
Frequency of micturition	25	1.51

Table 4: According to epithelial cell abnormality		
Pap report	*n*	%
Adequate sample	1544	93.57
Unsatisfactory sample	106	6.42
Negative for malignancy	806	48.84
Inflammation	704	42.66
ASCUS	48	2.90
LSIL	84	5.09
HSIL	8	0.48
Squamous cell carcinoma	0	0.0

Table 5: Correlation of pap smear finding with symptoms					
Symptoms	Negative for malignancy (*n*=806)	Inflammation (*n*=704)	ASCUS (*n*=48)	LSIL (*n*=84)	HSIL (*n*=8)
Asymptomatic (*n* = 250)	165	85	0	0	0
White discharge per vaginum (*n* = 610)	249	303	20	36	2
Pain in abdomen (*n* = 423)	205	180	12	22	4
Postcoital bleeding (*n* = 51)	25	26	0	0	0
Irregular bleeding (*n* = 211)	96	87	10	18	0
Frequency of micturition (*n* = 25)	14	8	1	2	0
Something coming out per vaginum (*n* = 56)	40	7	4	5	0
Post-menopausal bleeding (*n* = 24)	12	8	1	1	2

White vaginal discharge was the most common complaint of the women in our study at 36.96%, similar to the rate in other studies.[10,11]

The Pap smear was negative for malignancy in 48.84%, but 42.66% had inflammation. Other studies[12,13] reported 95% and 74.5% had inflammation indicated by the Pap smear test, respectively. A few studies[14,15] reported that women with persistent inflammation should be appropriately treated; otherwise, the chance of development of cervical intraepithelial lesions increases. A repeat Pap smear should be taken after proper antibiotic treatment.

Our study had an unsatisfactory report rate of 6.42%, which might have been due to dryness of the smear or a technical error. The 4.8% unsatisfactory report rate reported by Vaghela *et al.*[9] might have been due to proper training of personnel and the use of the proper technique.

ECA was detected in 8.48% of our screened women, a result comparable to the ECA detection rates of 9.05%, 12.60%, and 11.95% in the studies performed by Al Eyd *et al.*,[16] Patel *et al.*,[6] and Sarma *et al.*,[17] respectively.

In our study, the ECA ASCUS was found in 2.9% of screened women, LSIL in 5.09%, and HSIL in 0.48%, results comparable to those in a study done by Verma *et al.*,[18] who found ASCUS in 1%, LSIL in 5.5%, and HSIL in 2.5% of their screened women. Padmini *et al.*[19] also reported ASCUS (8%), LSIL (5%), and HSIL (3%) in women screened with the Pap smear test. Higher numbers of LSIL (8.6%) and HSIL (3.8%) lesions were found in a study by Nayani and Hendre.[20] The high prevalence of cytological abnormality observed in Indian studies might be due to cultural differences, age of the individuals, incidence of related infections, awareness about screening, and the presence or absence of cervical screening programs in different parts of the country. A Saudi Arabian study[21] had a 4.9% detection rate for the epithelial pathological diagnosis of SIL. The higher SIL rate was a result of a lack of awareness about screening and a lack of screening programs. In contrast to our study, Saha *et al.*[22] reported ASCUS (5.92%) to be the most common cytological abnormality.

Cervical cancer commonly develops in women between the ages of 40 and 50 years and its precursor lesion usually occurs 5–10 years earlier. Therefore, it is recommended that women should have at least one Pap smear test before the age of 45 years.[23,24]

Conclusion

Pap smear testing is a very useful, simple, economical, and safe tool for detecting precancerous cervical epithelial lesions. It should be established as a routine screening procedure to reduce the treatment burden, morbidity, and mortality. Every woman above the age of 30 years should undergo routine cervical cancer screening, even into the postmenopausal period. The Pap test has been regarded as the gold standard of cervical screening programs. When the Pap test is combined with an HPV DNA test, the sensitivity for detection of cervical pathology is increased. The community should be educated about the Pap smear test, including its goal and the required frequency of application, by widespread educational and media programs. Most women who visited an outpatient clinic are not aware of cervical cancer screening. Thus, there is a need to spread cancer screening programs to help prevent mortality and morbidity due to cervical cancer.

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Conflicts of interest

There are no conflicts of interest.

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