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Pap Smear for Screening of Carcinoma Cervix: A Hospital-Based Study from Rural North India

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Abstract

Background: Cervical cancer is a major health problem, especially for developing nations like India. Due to a long precancer stage and screening test availability, cervical cancer precursor lesions can be detected at an early stage and managed to reduce the burden of new cases. Screening by pap smear is a simple, feasible, and cost-effective method. Therefore, this study aims to screen women using this test for epithelial abnormalities and cervical carcinoma and to correlate pap smear findings with clinical features.

Methods: A total of 1145 sexually active women between the ages of 21 and 65 years attending the gynecology OPD at Government Medical College, Kathua, over five years from 2020 to 2024 were screened using pap smear.

Results: Most of the women were aged 21-35 years, while the majority were para2. Vaginal discharge was the most common complaint seen in 25.4% of the cases, while 21% of the cases were asymptomatic. 40% of cases had whitish discharge on examination, while cervical erosions were present in 2.7%. Abnormal cytology was reported in 2% of the cases, whereas 92.7% of cases were reported negative for malignancy in our study. Atypical squamous cells of undetermined significance (ASCUS) were seen in 0.5%, low-grade squamous intraepithelial lesion (LSIL) in 1.1%, high-grade squamous intraepithelial lesion (HSIL) in 0.3% and squamous cell carcinoma (SCC) in 0.1% of cases.

Conclusion: Pap smear is an effective screening tool for cervical cancer, and it should be offered at the primary level of health care. Developing awareness among

women regarding the feasibility and the benefits of screening can lead to better participation by women.

Keywords: Carcinoma cervix, Pap smear, LSIL, HSIL, ASCUS.

Introduction

Cervical cancer is the third most common malignancy in women worldwide. The frequency varies considerably between developed and developing countries. Cervical cancer is the second most common cancer in developing countries, but only the tenth most common in developed countries. Similarly, cervical cancer is the second most common cause of cancer-related deaths in women in developing countries, but it is not even among the top 10 causes in developed countries⁽¹⁾. The annual number of cervical cancer cases reported in India is 1,23,907, and 77,348 have died from the disease, as reported in the data by the International Agency for Research on Cancer (IARC) information centre on HPV and Cancer⁽²⁾. There is a prolonged preinvasive stage, which makes the screening programs for cervical cytology beneficial, and the therapy for preinvasive lesions is successful; therefore, invasive cervical cancer has been regarded as a preventable malignancy⁽³⁾.

The mainstay of cervical cancer screening for the last 60+ years has been the Papanicolaou test, also known as the Pap test or the Pap smear. The collection of the Papanicolaou test currently involves sampling the cervix at the transformation zone using a spatula or brush. The transformation zone is where the ectocervix and endocervix meet, and dysplasia is most likely to be identified. Since the introduction of the screening test, techniques for sampling cervical cells and analysing them for dysplastic changes have advanced.

The Papanicolaou test is meant as a screening examination, not as a diagnostic tool. Sensitivity ranges

from 30-87%, and specificity ranges from 86-100%^(4,5). Papanicolaou test results are routinely reported according to the Bethesda system. This was introduced in 1988 and revised in 2001 and 2008. The most recent update to the system was done in 2014^(6,7). The Papanicolaou test has been implemented in countries around the world as a screening strategy, and subsequent reductions in rates of cervical cancer by 50% or more have been seen⁽⁸⁾.

Therefore, we planned this study to screen women attending a gynecology clinic for epithelial abnormalities and cervical carcinoma cervix and to correlate pap smear findings with clinical features of patients.

Materials and Methods

It was a cross-sectional study conducted on women attending the gynecology OPD at Government Medical College, Kathua, over five years. Inclusion criteria include all sexually active women attending the gynecology OPD between 21 and 65 years of age. Exclusion criteria include antenatal patients and known cases of carcinoma cervix, low-grade squamous intraepithelial lesion (LSIL), and high-grade squamous intraepithelial lesion (HSIL).

In each case, detailed history, gynecological /obstetrics history, general physical examination, abdominal examination, and speculum examination were performed. Pap smears were taken in each case. These smears were immediately fixed in 90% propanol and sent to the Department of Pathology, Govt. Medical College, Kathua, along with a cytology requisition form. These smears were evaluated by conventional cytology. Cervical cytology results were reported according to the Bethesda System 2014.

The study was approved by the Institutional Ethics Committee. All participants were informed about the objectives of the study before taking the samples, and

written informed consent was obtained from subjects under study.

Results and discussion

A total of 1,145 patients were included in the study over five years, from January 2020 to December 2024. Table 1 shows the basic demographic details of the women in the study. Women aged 21-65 years were included in the study. Out of the total 1145 women screened, 38.7% were aged 21-35 years, 29.7% were aged 36-45 years, 21.65%

were in the 46-55 years age group, and the remaining 10% belonged to the 56-65 years age group. Among the women screened, para1 and para2 constituted about 31.1% and 34.5% of the total cases, respectively. 60.2% of the women were educated, while 59% of the women belonged to rural areas. The majority (78.3%) of the women who participated in the study belonged to the Hindu religion.

Table 1: Distribution of the cases according to the demographic details

Demographic parameter		Frequency	Percentage
Age group	21-35 years	443	38.7%
	36-45 years	341	29.7%
	46-55 years	246	21.65
	56-65 years	115	10%
Parity	P1	356	31.1%
	P2	393	34.5%
	P3	282	24.6%
	P4	92	8%
	P5	22	2%
Literacy level	Educated	689	60.2%
	Uneducated	456	39.8%
Residence	Rural	675	59%
	Urban	470	41%
Religion	Hindu	897	78.3%
	Muslim	248	21.7%
Total		1145	100

Table 2 shows the chief complaints of the women presenting to the OPD at the time of pap smear testing. Among the 1145 women screened, 240 women (21%) were asymptomatic at presentation. The most common complaint was discharge per vaginum, seen in 25.4% of the cases. Abnormal vaginal bleeding (AUB) was seen in

17.8%, lower abdominal pain in 15.5% and post coital bleeding in 2.5% of the cases. Feeling of heaviness or mass coming per vaginum was seen in 8.1% of the cases, and post-menopausal bleeding in 3.1% of cases. Fibroid uterus and urinary tract infection symptoms were seen in 4.5% and 2.1% of the cases, respectively.

Table 2: Distribution of the clinical symptoms of the cases

Chief complaints	Frequency	Percentage
Discharge per vaginum	290	25.4%
Abnormal vaginal bleeding	204	17.8%
Pain lower abdomen	178	15.5%
Something coming out per vaginum	93	8.1%
Fibroid uterus	52	4.5%
Post menopausal bleeding	36	3.1%
Post coital bleeding	28	2.5%
Urinary tract infection	24	2.1%
Asymptomatic	240	21%
Total	1145	100%

Table 3: Clinical examination details of the cases

Clinical examination	Frequency	Percentage
Normal-looking cervix	464	40.5%
White discharge	493	43%
Cervical erosions	31	2.7%
Cervicitis	25	2.2%
Utero vaginal prolapse	93	8.1%
Cervical bleeds on touch	17	1.5%
Cervical polyp	22	2%
Total	1145	100%

Table 3 depicts the spectrum of clinical examination findings of the cases at the time of testing. Approximately 40.5% of the cases had a normal-looking cervix, whereas 43% of cases had whitish discharge from the cervix.

Cervical erosions were seen in 2.7% of cases, cervicitis in 2.2%, cervical bleed on touch in 1.5% and cervical polyp in 2% of cases. 8.1% of cases presented with uterovaginal prolapse.

Table 4: Distribution of cases according to epithelial cell abnormalities

Pap smear report	Frequency(n)	Percentage (%)
Unsatisfactory	61	5.3
NILM	1062	92.7
ASCUS	5	0.5
LSIL	13	1.1
HSIL	3	0.3
SCC	1	0.1
Total	1145	100

Table 4 demonstrates the Pap smear findings as per the Bethesda 2014 reporting system. The majority (92.7%) of the cases had NILM, while 5.3 of % cases had an unsatisfactory report. ASCUS was seen in 0.5% of cases.

LSIL was reported in 13 cases(1.1%) while HSIL was reported in 3 cases (0.3%). Only one case (0.1%) of SCC was reported in the study.

Table 5: Distribution of abnormal pap smear across age groups.

	21-35 years	36-45 years	46-55 years	>55 years
Bacterial vaginosis	9	7	0	0
Atrophic vaginitis	0	0	7	15
ASCUS	1	2	2	0
LSIL	3	1	3	6
HSIL	0	0	1	2
SCC	0	0	0	1

Table 5 shows the distribution of abnormal pap smear findings in different age groups. Bacterial vaginosis was mostly seen in women aged 21 to 45 years, whereas on the other spectrum, atrophic vaginitis was seen in the older age group >46 years. ASCUS was distributed equally across age groups up to 21- 55 years. LSIL was reported in all the age groups, but the maximum cases were seen in women>55 years and women 21-35 years. HSIL was reported in women aged >46 years, while SCC was reported in women >55 years.

Discussion

In this present study, the majority of the women belonged to the age group 21-35 years, which represents the childbearing population. This population group is the age group for which the screening for cervical cancer is recommended. About one-third of the women in the study were para2. Educated women were more common in the study, with the Hindu population constituting >75% of the cases. In such a study by Sharif YH ⁽⁹⁾, about 200 women were screened by pap smear, and the mean age of cases was 31 years, while the mean parity was 3.29 ± 1.25, which was shown to be related to an increased risk of HPV infection. High parity has been

linked to an increased risk of cervical neoplasia, as studied in a study by David MS et al ⁽¹⁰⁾.

It was seen in our study that the most common complaints reported by the patients were discharge per vaginum (25%), abnormal uterine bleeding(17.8%), and lower abdominal pain (15.5%). On the contrary, 21% cases were asymptomatic. These asymptomatic cases constitute the portion that is quite often overlooked and sometimes missed in screening programs. Sharif YH ⁽⁹⁾ observed that about 82.5% of cases studied were asymptomatic, and 7 cases who were asymptomatic were found to have high-risk HPV. Vaginal discharge remains the main complaint of women screened across various studies, although the rates vary. Mishra et al ⁽¹¹⁾ reported that 47.92% of the women were found with chief complaints of vaginal discharge, and 30.4% of women were asymptomatic. Sachan et al ⁽¹²⁾ also reported vaginal discharge as the main complaint in 36% cases, which was higher than our study result (25%). Nayir et al ⁽¹³⁾ and Verma et al ⁽¹⁴⁾ also reported vaginal discharge as the main complaint.

A normal-looking cervix on examination was seen in 40.5% cases, and 40% cases had whitish discharge in our

study. Sachan et al ⁽¹²⁾ observed that on per speculum examination, white discharge was found in 29.69% of the participants, which was lower than our study. However, cervical erosions were present in 19.21%, which was quite higher than ours.

Abnormal cytology was reported in 2% of the cases, whereas 92.7% of cases were reported negative for malignancy in our study. ASCUS was seen in 0.5%, LSIL in 1.1%, HSIL in 0.3% and SCC in 0.1% of cases. D. Sengul et al ⁽¹⁵⁾ screened 32,578 cases, and the rate of cervical cytological abnormality was 1.83%, with ASCUS in 1.18%, LSIL in 0.39%, HSIL in 0.16%, AGUS in 0.07%, squamous cell carcinoma in 0.02%, and adenocarcinoma in 0.006%. Nayir et al ⁽¹³⁾ screened 1,032 women between 30 and 65 years and found epithelial cell changes in 26 (2.5%) participants, with ASC-US in 18 (1.7%), ASC-H in 2 (0.2%), LSIL in 5 (0.5%), and HSIL in 1 (0.1%).

Our results are quite lower than the findings in other studies. Verma A et al ⁽¹⁴⁾ found ASCUS in 1% but a higher rate of LSIL in 5.5%, and HSIL in 2.5% of their screened women. Similarly, a study by Padmini et al ⁽¹⁶⁾ reported ASCUS in 8%, LSIL in 5%, and HSIL in 3% of women. Nayani ZS et al ⁽¹⁷⁾ reported LSIL in 8.6% and HSIL in 3.8% of women screened. Our study had an unsatisfactory report rate of 5.3%. Vaghela et al ⁽¹⁸⁾ and Sachan et al ⁽¹²⁾ also reported similar rates of unsatisfactory reports in 4.8% and 6.4% of cases, respectively. The most common epithelial abnormality detected in our study was LSIL (1.1%), out of which 3 cases were detected in women <35 years. Vaghela et al ⁽¹⁸⁾ also reported that LSIL was the most common epithelial abnormality. Gupta et al ⁽¹⁹⁾ reported that 40.37% of cases in their study were in the age group of 30–39 years, while LSIL was seen in 1.36%.

Conclusion

Pap smear is an affordable, effective test for screening of cervical cancer. This is especially important in areas where the resources are limited and women's knowledge and awareness regarding cervical cancer are minimal. Owing to its long period of precancerous stage and availability of adequate treatment of epithelial abnormalities, the cervical cancer burden can be significantly reduced. From this study, we can conclude that screening of all women, irrespective of the symptoms, should be done to ensure proper coverage and to provide better health services to those who are often missed.

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