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Pratibha Kumari
Senior Resident, Department of Gynecological Oncology, IGIMS, Patna, Bihar, India

Satya Kumari
Senior Resident, Department of Gynecological Oncology, IGIMS, Patna, Bihar, India

Sangeeta Pankaj
Professor & Head, Gynecological Oncology, IGIMS, Patna, Bihar, India

Corresponding Author:
Satya Kumari
Senior Resident, Department of Gynecological Oncology, IGIMS, Patna, Bihar, India

Pap smear: A cost effective method of screening of cervical cancer in a tertiary care centre

Pratibha Kumari, Satya Kumari and Sangeeta Pankaj

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Abstract
Cervical cancer is one of the commonest cancer cause of death among women worldwide. >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. Conventional Pap smear testing has been the mainstay of most of the screening programs. Cervical cytology screening by Pap smear has been proven to decrease the incidence and mortality of cervical cancer.
Material and Methods: This study was conducted in the department of Gynecological Oncology, State Cancer Institute at Indira Gandhi Institute of Medical Sciences, Patna, Bihar. 876 women above 20 years of age were enrolled in this study and they were screened for cervical cancer by taking Pap smear. The smears were studied in detail and were interpreted as per the new Bethesda System for Reporting Cervical Cytology 2014.
Results: In this study, most of the women belonged to 41 to 50 years of age group. White discharge per vagina is the chief complain. 69.59% women were negative for intraepithelial lesions or malignancy. Inflammatory smear were found in 10.76% women. Epithelial cell abnormalities reported on cervical cytology were ASCUS in 1.86%, LSIL in 0.13%, HSIL in 2.52%, ASC-H in 0.13%, Squamous cell carcinoma in 6.51% and Adenocarcinoma in 0.53%.
Conclusion: Pap smear based cervical cytology is a simple, safe, and cost-benefit test to detect premalignant and malignant cervical lesions at an early stage. Pap smear should be encouraged as a screening method in developing countries like INDIA due to its low cost and effectiveness in detecting cervical lesions, especially high-grade.

Keywords: Cervical cytology, cervical cancer, ASCUS, LSIL, HSIL

Introduction
Cervical cancer is one of the commonest cancer cause of death among women worldwide. It is an increasing health problem and an important cause of mortality in Indian women. The incidence of cervical cancer has arisen worldwide. The incidence of cervical cancer is 9 per 100.000 for women in developing countries [1]. The rate of cervical cancer has declined dramatically in recent years [1]. The most important reason for this is the regular cervical smear screening programs. 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 [2]. More than one-fifth of all cervical cancer deaths occur in India [3]. Every year, 122,844 women in India are diagnosed with cervical cancer, and 67,477 women die from the disease [4]. Cervical cancer is 2nd most common cancer in women in India according to GLOBOCON 2018 with age standardized incidence rate of 14.7 and mortality rate of 9.2.
Cervical cancer is a totally preventable disease due to its long pre invasive stage. Early detection and appropriate treatment are possible if a proper screening is implemented [5]. Cervical cytology screening by pap smear has been proven to decrease the incidence and mortality of cervical cancer and to increase the cure rate of cervical cancer (1-4). NCCN Cervical cancer screening guidelines provides direction for evaluation and management of cervical cytology. The NCCN guidelines include screening methods by cytology (pap smear/liquid based cytology) alone or in combination with human papilloma virus (hpv) DNA testing and colposcopy (1-2). The overall sensitivity of the Pap test in detecting a high-grade squamous intraepithelial lesion (HSIL) is 70.80% [6].

A Pap screening done in association with an HPV DNA test increases the sensitivity for early detection of precancerous lesions [7].

Materials and methods

This is a retrospective study which was carried out in married women who visited from 1st January 2018 till 31st December 2018 in the Department of Gynaecological oncology, state cancer institute, IGIMS, Patna, Bihar. We screened 876 sexually active women who were more than 21 years of age. Women with different complaints like watery or whitish vaginal discharge, blood-mixed or foul-smelling discharge, post-coital bleeding, irregular menses, postmenopausal bleeding and abdominal pain were included in this study. Women who had a prior hysterectomy, had existing precancerous-cancerous cervical lesions or a history of gynecologic malignancies, had received pelvic radiation, or were pregnant were excluded from the study. A detailed history was taken using a predetermined proforma that included the chief complaint and the findings of per speculum and vaginal examinations. Informed consent was taken from all women before taking pap smear. Patients were examined in the lithotomy position by using a sterile bivalve cusco speculum. A pap smear sample was taken from the ectocervix by rotating a wooden Ayre spatula 360°. The sample was immediately smeared onto a labeled glass slide and fixed with 95% ethyl alcohol in a coplin jar. The glass slides were sent for cytopathological examination. Reporting of slides was done according to the new Bethesda System for Reporting Cervical Cytology 2014 by the pathologist. The system broadly divides lesions into those negative for intraepithelial lesion or malignancy (NILM), epithelial cell abnormalities (ECA) that include squamous and glandular cells and others (endometrial cells in a woman >45 years of age).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. colpo directed biopsy were taken from suspicious areas and sent for histopathological examination. Treatment was provided according to the stage of the disease. women who were diagnosed of squamous cell cancer or adenocarcinoma were followed by biopsy and treated according to stage of cancer.

Result

Table 1: In this study, most of the women belonged to 41 to 50 years of age group followed by women belonging to 31 to 40 years of age group.

Age group (years)	No. of patients (total=876)	Percentage (%)
20-30	99	11.30
31-40	258	29.45
41-50	265	30.25
51-60	157	17.92
61-70	77	8.79
71-80	18	2.05
>80	2	0.23

Table 2: Shows that white discharge per vagina is the chief complain found in 33.68 % of the women taking part in the study. It was followed by patients visiting to OPD for routine checkup without any symptoms (23.17%). Post coital bleeding was found in only 5.14 %, abdominal pain in 20.20 %, post menopausal bleeding in 4.34 % of the women.

Symptoms	No. of patients (total=876)	Percentage (%)
For routine check up	203	23.17
watery/white discharge p/v	295	33.68
Pain in abdomen	177	20.20
Menstrual abnormalities	98	11.19
Post coital bleeding	45	5.14
Post-menopausal bleeding	38	4.34
Something coming out p/v	20	2.28

This study shows 69.59% (524) women were negative for intraepithelial lesions or malignancy. Inflammatory smear were found in 81 (10.76%) women. Epithelial cell abnormalities reported on cervical cytology were ASCUS in 1.86%, LSIL in 0.13%, HSIL in 2.52%, ASC-H in 0.13%, Squamous cell carcinoma in 6.51% and Adenocarcinoma in 0.53%. 34(4.52%) samples were found unsatisfactory for evaluation (table 3). Out of 876 women 123(14.04%) did not reported to outdoor with their reports. These patients were not included in pap reporting sample.

Table 3: Epithelial cell abnormalities

Pap report	n (% of 753 women)
Unsatisfactory sample	34 (4.52)
Negative for intraepithelial lesions & malignancy (NILM)	524(69.59)
Inflammatory	81(10.76)
Atrophic	26 (3.45)
ASCUS	14(1.86)
ASC-H	1(0.13)
AGC	0
LSIL	1(0.13)
HSIL	19(2.52)
Squamous cell carcinoma	49(6.51)
Adenocarcinoma	4(0.53)
Report not found	123(14.04% of 876)

Discussion

Cervical cancer is the second most common cancer among women worldwide [8]. Each year, about half a million of women are newly diagnosed with invasive cervical cancer, and majority of them never went for screening for the disease in their lifetime. If this continues, by year 2050 over, about one million women will be suffering with cervical cancer. Among these, more than 80% of women are from developing countries where screening, treatment, and prevention programs are out of reach from most of the needy women [9]. According to National Institute of Cancer Prevention and Research, one woman dies of cervical cancer every 8 minutes in India [10]. Cervical cancer is the third largest cause of cancer mortality in India accounting for nearly 10% of all cancer-related deaths in the country [11].

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 [12]. In our study, most of the patients belonged to the age group between 41 and 50 years(30.25%) followed by age group of 31-40 years(29.45%). Gupta *et al*. [13] reported that most of the 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. Our study had an unsatisfactory report rate of4.52% which is similar to the 4.8% unsatisfactory report rate reported by Vaghela *et al*. [14]

White/watery vaginal discharge was the most common symptom of the women in our study at 33.68%, similar to the rate in other studies [15, 16]. Slides were reported according to the new Bethesda System for Reporting Cervical Cytology 2014 by the pathologist [17]. The Pap smear was negative for malignancy in 69.59 % but 10.76% had inflammation. Lawley *et al*., [18] observed 14.3% inflammatory smears; on the other hand, Kulkarni *et al*., [19] observed a high rate of 73.7%. In our study ASCUS was found in 1.86%, ASC-H in 0.13%, LSIL in 0.5% which is similar to other studies [20]. A few studies [21, 22] reported that women with persistent inflammation should be treated appropriately; otherwise, there is high chance of development of cervical intraepithelial lesions. Therefore after proper course of antibiotic treatment a repeat Pap smear should be taken. HSIL was found in 2.52%, Squamous cell cancer was found in 6.51% of women, Adenocarcinoma in 0.53%. This high rate of higher grade of epithelial lesions are due to most of women reach late to their clinicians for treatment. They do not come for check up even in presence of symptoms because of ignorance and lack of knowledge about screening methods available for cervical cancer. Cervical cancer commonly develops in women between the ages of 40 and 50 years and its precursor lesion usually occurs 5–10 years earlier as shown in the study by Shanmugham *et al*. [23] Therefore, it is recommended that every sexually active woman should have at least one Pap smear test before 45 years of age [24, 25].

Conclusion

Pap smear based cervical cytology is a simple, safe, and cost-benefit test to detect premalignant and malignant cervical lesions at an early stage. Despite the development of new technologies to diagnose cervical cancer such as molecular biology methods (polymerase chain reaction (PCR) and hybridization), Pap smear still remains the most useful and efficient method of screening. Pap smear should be encouraged as a screening method in developing countries like INDIA due to its low cost and effectiveness in detecting cervical lesions, especially high-grade. Most of the women do not come for checkup even in the presence of symptoms because of ignorance. They do not know about the facilities available at government sectors for screening of cervical cancer. When they reach, its too late for them and for consulting doctors too. So the consulting doctors and health care workers should devote enough time and effort to educate the women coming for screening about benefits and implications of Pap smear examination. Each and every sexually active woman should have at least one Pap smear test before 45 years of age. Government sector should make pap as mandatory examination for women attending health clinics and government hospitals.

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