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Original Research Article

A Study of Efficacy of Pap smear as Screening Method in Detecting Early Cervical Cancer

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Conflict of interest: Nil

Abstract

Background: Cervical cancer is one of the major causes of mortality among women worldwide. So, the research aimed to study and analyse 100 Pap smear reports from women presenting with various gynecological indications and detection of precancerous lesions.

Methods: Study was carried out by taking 100 Pap smears from patient attending gynaecology OPD at M.P Shah Medical College, Jamnagar, Gujarat, Between 12/03/2024 to 12/03/2025. Pap smear was taken from patients between ages 25 to 70 years presenting with different gynaecology complaints and using Ayres Spatula. Smears were reported as per the Bethesda system.

Results: Most women were in the age range of 25-70 years. Vaginal discharge was the major clinical 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 test was negative for malignancy in 6%, and 78% had infection or inflammation. ASCUS, LSIL, and HSIL were detected in 8 %, 6%, and 0%, respectively. Women with Pap tests positive for ASCUS, LSIL, and HSIL underwent a colposcopy and guided biopsy.

Conclusions: Pap smear is an easy and economical screening method to detect premalignant and malignant lesions of the cervix which help in proper treatment. It should be established as a routine screening procedure to reduce the treatment burden, morbidity, and mortality.

Keywords: Bethesda System, Biopsy, Cervical Precancerous And Cancerous Lesion, Colposcopy, Pap Smear.

Introduction

Cervical cancer is an important health problem and leading cause of morbidity and mortality amongst women globally. Worldwide is the second most common and 5th deadliest cancer in women but in India, cervical cancer is the most common genital cancer encountered in clinical practice. [1]

World Health Organisation recommended that the aim should be to screen every woman once in lifetime at 40 years. Frequency of screening should be increased to once every 10 years and then once every 5 years for women 35 years of age. The frequency should be decided based on resources. [2] Risk factors for the cervical cancer include early age of first pregnancy, multiple sexual partners, cigarette smoking, and exposure to human papilloma virus, immunosuppression, and early onset of sexual activity, human immunodeficiency virus or neoplasia of vulva or vagina. [3] Adequacy and frequency of cytological screening play an important role, the risk of developing invasive squamous cell carcinoma in women who had no Pap smear screening in the last 5 years being 4.5 times greater than in women who had pap smear screening in the past two years. Thus, risk of death is greater in women with inadequate cytological screening. [3] Prevention of cervical cancer can be done by primary prevention and early detection using screening techniques.

Different screening techniques are available, they differ according to their characteristics and economic resources. Screening of cervical cancer is useful because it allows detection at its pre-invasive stage. Thus, mortality from cervical cancer has decreased by more than 70% since cervical screening has been implicated. The sensitivity of conventional pap smear is 70-80% and 85-95% for

liquid based cytology tests. Food and Drug Administration's (FDA) approved HPV vaccines by the two major companies (Merck and GlaxoSmithKline). This vaccine is extremely useful, prevents the infection with certain types of HPV virus mainly types 16, 18 which are mainly responsible for 70% cases of cervical cancer. More ever vaccine does not provide protection if already effected by the HPV virus and may increase their risk of lesions leading to cervical cancer.

Two main vaccines are available Gardasil- protects against 6, 11, 16, 18 given to women of age 9-26 years. (Cervarix- protect against 16 and 18 which mainly causes cervical cancer. But vaccine related lesions are common in women with HPV infections. So gold standard for early detection and better prognosis of cervical cancer. [4]

Background and Objectives: Cancer cervix is emerging to be an important health problem with the change in lifestyle and demographic profile of developing countries that demand appropriate control programmes before they assume epidemic proportion.

In India cancer cervix is a significant problem in terms of incidence, mortality and morbidity, being the second commonest female cancer in the world attributed for 3 lakh deaths annually with inclusion of 5 lakhs new cases per year, which has a major impact on the women's lives worldwide. Since cancer cervix has a long premalignant phase, it is both preventable and curable, in its earliest phase by primary prevention and early detection using appropriate screening technique. "Screening for cancer cervix is viewed as an investment in extending life".

Screening of cancer cervix is vital both for diagnosis and treatment, in its earliest phase and has significantly reduced both incidence and mortality by 80%. Pap smear in the presence of good training and sustained quality assurance is an effective method to prevent cancer cervix which has proven value in reducing both mortality and morbidity.

Pap smear test is performed by opening the vaginal canal with Cusco's speculum and collecting cells at the outer opening of the cervix i.e. at the transformation zone, 5 from posterior vaginal wall and endocervical canal. Then the collected cells are examined under a microscope.

The test mainly meant to detect precancerous conditions like cervical intraepithelial neoplasia (CIN) or cervical dysplasia, squamous intraepithelial lesion system (SIL) etc. [6] Pap smear test is an effective, cost effective and widely used method for early detection of pre-cancer and cervical cancer. But more sensitive and specific investigations like colposcopy guided cervical biopsy etc are needed to diagnose and prevent further progression to cervical cancer. [7]

Aim of study: To study all types of cervical lesions by Pap smear and to create awareness about the importance of pap smear examination in early diagnosis and prevention of cervical cancer.

Objectives of the study: To diagnose all types of cervical lesions including Inflammatory, reactive, benign, precancerous and malignant lesions of the cervix by pap smear. To classify all types of neoplastic cervical lesions using the Bethesda system. To establish the role of pap smear examination in early diagnosis and prevention of cervical cancer.

Methods

This retrospective study was carried out in Gynaecology OPD at M.P Shah Medical College and Hospital, Jamnagar, Gujarat, India from 12 march 24 to 12 march 25 Around 100 Pap smears were taken from women between ages of 25 to 70 years presenting with different Gynaecological complaints (e.g. vaginal discharge, blood-mixed discharge, foul-smelling discharge, postcoital bleeding, intermenstrual bleeding, postmenopausal bleeding, abdominal pain, infertility, and secondary amenorrhea).

Women below 25 years and above 70 years or women without sexual exposure. Those denied to participate. 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. The broad end of the spatula was placed on the cervix and rotated through 360° and the collected material was spread over a glass slide.

The oblong relabelled narrow end of spatula was used to take smear from posterior vaginal fornix and spreaded over a second glass slide for as control. The endo cervical sample was collected using a cytobrush and was spread over a labelled third glass slide.

All the slides were immediately transferred to 95% ethyl alcohol (transport medium) and sent to the pathology department for cytological study.

Smears were reported as per the Bethesda system. We took ethical clearance to do this retrospective study.

Evaluation was done by cytology using Bethesda classification: within normal limits, infection (specify organism), reactive/reparative changes, atypical squamous cells of undetermined significance (ASCUS), atypical glandular cells of

undetermined significance (AGUS), low grade squamous intraepithelial invasion (LSIL), high grade squamous intraepithelial invasion .

Follow up: Pap smear was advisable after 21 years in women having sexual history. Can be repeated in every 3 to 5 years if results are normal. In case of abnormal results more frequent repetition of tests like in every 6 months to 1 year are needed.

High risk group were subjected to human papilloma virus (HPV) DNA testing. Negative procedure value of one HPV DNA testing and two negative cytology tests was 100%. False negative tests can be <1% after three consecutive negative tests.

False negative reports can be due to inadequacy of sample, blood stained sample, poor staining, misinterpretation by cytologist. In our study of the age of the patient, presenting symptoms, reports of cytology were observed and analysed. Before undergoing a Pap smear it's crucial to avoid certain practices to ensure accurate test results.

Avoid douching: Douching can wash away or dilute cells that need to be examined, potentially leading to inaccurate results.

Vaginal medications: Vaginal creams, suppositories and other medications can also interfere with the sample and obscure the true cellular condition of the cervix.

Sexual intercourse: Semen can also affect the sample. Abstaining from intercourse for a couple of day before the test helps ensure a clear sample.

Schedule around menstruation: While a Pap smear can be done during menstruation, it's generally better to schedule it either before your period starts or after it has finished for optimal results.

Results

In our study we analysed 100 Pap smears taken from women presenting to gynecology OPD of M.P. Shah Medical College, Jamnagar between 25 to 70 years presenting with different gynaec ological complaints.

Table 1: Distribution of patients according to age.

Age in year	Number of patients
25-35	24
36-45	25
36-45	25
46-55	17
55-65	8
Above 65	26
Total	100

In our study we have taken 100 women, in them 24 were between 25 to 35 years, 25 women were between 36 to 45 years, 17 women were between 46 to 55 years, women between 56 to 65 years were 8 and 26 women were above 65 years (Table 1).

Among the 100 women undergoing Pap smear tests, 30 women presented with chronic white discharge. 22 women underwent Pap smear test as part of routine gynaecological examination. 15 women presented with unhealthy cervix. Postmenopausal women were 09.

05 women were oral contraceptive pills users. 04 women presented with pelvic inflammatory disease. 04 women had abnormal uterine bleeding and 02 women presented with intermenstrual spotting (Table 2).

Table 2: Reason for performing PAP smear.

Reason for Performing PAP Smears	Number of Patients
Patients presenting with chronic whitish discharge	30
Routine PAP smear	22
Unhealthy cervix	15
Post-menopausal	9
Oral contraceptive pills	5
Pelvic inflammatory diseases	4
Abnormal uterine bleeding	3
Intermenstrual spotting	2

Most women were in the age range of 25-70 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.

Table 3: PAP smear analysis report.

PAP Smear Analysis Report	Number of Patients
Inflammatory smear	58
Low grade squamous intraepithelial lesion (LSIL)	6
Mild to Moderate dysplasia	4
High grade squamous intraepithelial lesion (HSIL)	2
No evidence of malignancy or normal	9
Infection	10
Atypical squamous cell of undetermined significance (ASCUS)	10
Squamous cell carcinoma	1
Total	100

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 6%, and 60% had inflammation and 18%had infection. 2% patients had mild to moderate dysplasia having further follow up 6 months or 1 years after Pap smear. Atypical squamous cells of undetermined significance (ASCUS), 2 low-grade squamous intraepithelial lesion (LSIL), and high-grade squamous (HSIL) were detected in 8%, 6%, and 0%, respectively. Squamous cell carcinoma referred to higher centre. Women with Pap tests positive for ASCUS, LSIL, and HSIL underwent a colposcopy and guided biopsy.

Discussion

The incidence of cervical cancer is quite high because prevention programs are either non-existent 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. It is accepted worldwide that early detection of precancerous lesions of cervix can be done by cytological examination of cervix by Pap smears.

If not diagnosed and treated early, these precancerous lesions are likely to progress to invasive cancers. It is proven that the cytological screening programs conducted in advanced countries played a major role in reducing mortality and morbidity due to cancer cervix.

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.

In our study the maximum number of women were between 46 to 55 years of age group (34%). In study number of women were between 36 to 45 years age group (25%) and between 26 to 35 years number of women were studied about (27%). In our study abnormal Pap smear reports were 100; whereas in study 90 (90%) reports were abnormal. And inflammatory smear reports were 58 in our study out of 100. Ranabhat et al found 26% cases of nonspecific inflammation in their study which is very low as compared to our study. [9] Smears showing ASCUS (atypical squamous cells of undetermined significance) were 10 in our study and confirmatory results by biopsy 3 were having ASCUS.

Smears showing LSIL (low grade squamous intraepithelial lesion) were 6 cases in our study and on confirmatory study 2 were having LSIS and in our study HSIL (high grade squamous intraepithelial lesion) and squamous cell carcinoma were 1% in our study. Though having few limitations in performing rural areas, reports in our study like many other studies has shown the importance of Pap smear test in screening cervical cancer. [10]

Limitation of the study is pap smear examination is only screening method. This screening method give basic idea about infective or inflammatory or dysplastic changes. One can give the confirmative diagnosis about stage of carcinoma nor the expansion. One should depend on colposcopic guide biopsy or punch biopsy. When the Pap test is combined with an HPV DNA test, the sensitivity for detection of cervical pathology is high but HPV DNA testing is expansive and not routinely used.

By conducting health camps, increasing health awareness and performing Pap smear screening programmes the incidence of cervical carcinoma can be decreased. [10,11]

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.

Early detection of the possibility of malignancy helps in prompt treatment at early stage and prolongation of life expectancy of many women

and reduce the mortality and morbidity of cancer cervix.

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 visit 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.

Ethical approval: The study was approved by the Institutional Ethics Committee

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