Original Research Article

A Study of Cervical Pap Smear in a Tertiary Care Hospital

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Abstract:

Background: Worldwide, 80% of all new cases of cervical cancer are found in developing nations, where there are almost 4 lakh new cases diagnosed each year. Early diagnosis of cervical cancers using efficient screening methods can help to prevent the disease. A sensitive test for early cervical lesion screening is the cervical Pap smear. The Bethesda system (2014) for reporting cervical cytology is used to interpret the cytology of smears. The aim of our study was to assess the different patterns of cervical lesions.

Methods: From April 2021 to March 2022, this cross-sectional hospital-based observational study was carried out at the Obstetrics and Gynecology department of a tertiary care hospital among women (15 to 90 years) who subjected to Papanicolaou (Pap) smear testing. During a Pap test, cellular material from the squamo-columnar junction of the cervix is gently scraped off with a brush or spatula and smeared onto a glass slide. The slides are fixed in methanol and stained with pap stain before being examined visually under a microscope by cytopathologists. The Bethesda system (2014) for reporting cervical cytology was used to interpret the cytology of smears. The data was entered into an MS Excel spreadsheet and used there for analysis. While nominal/categorical variables were summarized as a proportion(%).

Results: In our study, a total of 1049 patients underwent Pap smear examination during defined study period. In our study, the Pap smear examination showed that 90.4% of patients were Negative for intraepithelial lesion or malignancy (NLIM). Among the NLIM, Inflammatory (Non-specific) was the most common observation (53.3%). In our study Squamous cell carcinoma (SCC) was seen in 0.9% of patients; Atypical Squamous Cells of Undetermined Significance (ASC-US) was seen in 1.3% of patients; and Atypical Squamous Cells cannot exclude High grade squamous intraepithelial lesion (ASC-H) was seen in 1.3% of patients. Among 3.4% and 2.6% of patients Pap smear examination was normal and unsatisfactory respectively.

Conclusion: The significance of Pap smear screening for the early identification of cervix premalignant and malignant lesions was highlighted by this study. Early diagnosis of cervical premalignant lesions with a proper Pap screening programme can reduce the incidence of invasive cervical cancer.

Keywords: Pap smear, Cervix, Cervical Cancer, negative for intraepithelial neoplasia, Squamous cell carcinoma

Introduction

One of the main causes of death for women in developing nations is cervical cancer. With an estimated 5.7 lac new cases, or 6.6% of all female cancers, cervical cancer is the fourth most common cancer in women, according to Global Cancer Statistics (GCS) 2018. Nearly 90% of cervical cancer deaths occurred in low- and middle-income nations. In terms of both incidence (6.6%) and mortality (7.5%), cervical cancer comes in fourth place. The leading cause of cancer-related fatalities among women in developing nations is cervical cancer. While 86% of all cervical cancer deaths occur in developing, low-income, and middle-income nations, mortality from the disease is thus a significant indicator of health inequalities.[1] Cervical cancer affects 122,844 women in India each year, and 67,477 of them die from it. In South Asia, India also has the highest age-standardized incidence of cervical cancer (22) compared to Bangladesh (19.2), Sri Lanka (13) and Iran (2.8).[2] Since 1975, India has had a national cancer programme with a focus on establishing centers of excellence facilities. The National Programme for

Prevention and Control of Cancer (NPPCC), a more extensive, broader non-communicable illness programme, was established in 2010 to include cancer control.[3]

Since its introduction in 1941, the Papanicolaou (Pap) smear has served as the screening test for detecting premalignant lesions and cervical cancer. Cervical cancer is the third most frequent disease in women worldwide, next to breast and colorectal cancer, but it is the main cause of mortality and morbidity in developing nations like India. Symptoms including pain, discharge, and/or abnormal bleeding are usually the only occasions that women in these nations visit the clinic. Worldwide, 80% of all new cases of cervical cancer are found in poor nations, where there are almost 4 lakh new cases diagnosed each year. [4,5] Early diagnosis of cervical cancers using efficient screening methods can help to prevent the disease. A sensitive test for early cervical lesion screening is the cervical Pap smear. Although though a Pap smear is only a standard screening test, it has been shown to be quite effective at differentiating between inflammatory, premalignant, and malignant lesions. The overall sensitivity in detecting premalignant lesions like high grade squamous intraepithelial lesion (HSIL) is 70–80%. Hence, cervical cancer can be prevented by treating the epithelial alterations.[6,7]

In order to sub-classify lesions into high grade and low grade squamous intraepithelial lesions (SIL) for Pap smear reporting, the Bethesda terminology system was established in 1988. Other research reported a comparison of various terminologies.[8,9]The aim of our study was to assess the different patterns of cervical lesions among women patients in a tertiary care hospital.

Materials and Methods

From April 2021 to March 2022, this cross-sectional hospital-based observational study was carried out at the Obstetrics and Gynecology department of a tertiary care hospital in New Delhi. The study included the all women (15 to 90 years) who presented to obstetrics and Gynecology unit's inpatient and outpatient departments with complaints of vaginal discharge, post coital bleeding, intermenstrual bleeding, pain in lower abdomen and were subjected to Papanicolaou (Pap) smear testing during this study period. The study excluded women who have undergone hysterectomy, pregnant and used local antiseptic. The participants gave their written consent after receiving complete information.

All of the patients' features, including their age, clinical features (symptoms), and Pap smear findings were noted in preformed questionnaire. During a Pap test, cellular material from the squamo-columnar junction of the cervix is gently scraped off with a brush or spatula and smeared onto a glass slide. The slides are fixed in methanol and stained with pap stain before being examined visually under a microscope by cytopathologists. The Bethesda system (2014) for reporting cervical cytology was used to interpret the cytology of smears. The Bethesda system (2014) categorises lesions as either being negative for intraepithelial neoplasia (NILM) or having abnormal epithelial cells, including squamous and glandular cells. The abnormality of the squamous epithelium has been divided into two categories: atypical squamous cells (ASC), which includes ASC of uncertain significance (ASC-US)/ASC cannot exclude high grade squamous intraepithelial lesions (ASC-H), and squamous intraepithelial lesions (SIL), which includes Low grade SIL (LSIL)/High grade SIL (HSIL). LSIL and HSIL patients were counselled and advised to have a biopsy for histopathological examination. Squamous cell carcinoma was the label given to an aggressive kind of cancer.

Statistical Analysis

The data was entered into an MS Excel spreadsheet and used there for analysis. While nominal/categorical variables were summarized as a proportion (%).

Results

In our study, a total of 1049 patients underwent Pap smear examination during defined study period. Most of the patients in our study were <30 years of age (25.1%) and 31-40 years of age (35.0%).The patients >80 years were 0.9% and patients in age group 71-80 years and 61-70 years were 2.2% and 2.6% respectively (Table 1 and Figure 1).

Table 1: Age group wise distribution of study subjects

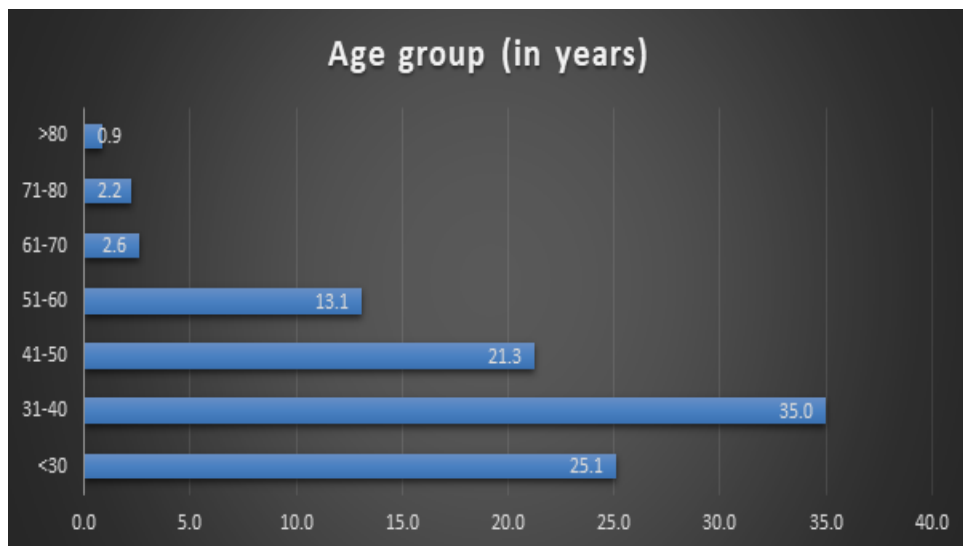| Age group (in years)	Frequency	%
<30	263	25.1
31-40	367	35.0
41-50	223	21.3
51-60	137	13.1
61-70	27	2.6
71-80	23	2.2
>80	9	0.9

Figure 1: Age group wise distribution of study subjects

In our study, the most common presenting symptom among the patients who underwent Pap smear examination was vaginal discharge (34.8%). Pain in abdomen was observed among 15.9% of patients, menorrhagia among 18.0%, post-coital bleeding among (13.7%). In our study about 5.6% of patients who underwent Pap smear examination were asymptomatic (Table 2 and Figure 2).

Table 2: Symptom wise distribution of study subjects

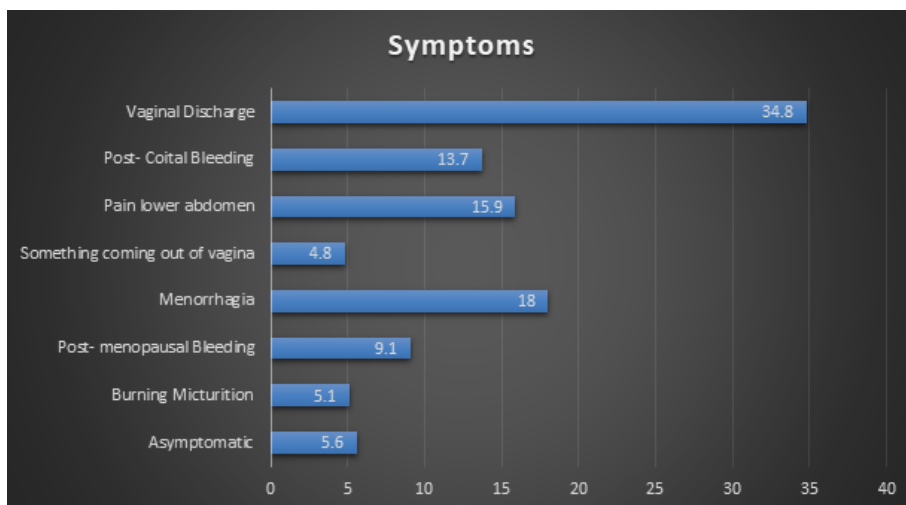| Symptoms*	Frequency	%
Asymptomatic	59	5.6
Burning Micturition	54	5.1
Post- menopausal Bleeding	95	9.1
Menorrhagia	189	18.0
Something coming out of vagina	50	4.8
Pain lower abdomen	167	15.9
Post- Coital Bleeding	144	13.7
Vaginal Discharge	365	34.8

Multiple Responses

**Figure 2: Symptom wise distribution of study subjects**

In our study, the Pap smear examination showed that 90.4% of patients were Negative for intraepithelial lesion or malignancy (NLIM). Among the NLIM, Inflammatory (Non-specific) was the most common observation (53.3%). Among NLIM, the Atrophic Pap smear was seen in 7.7% of patients. Among NLIM, the infection with candidiasis (8.2%), trichomoniasis (8.3%), actinomycosis (0.9%) and bacterial vaginosis (8.2%) during Pap smear examination showed. Among NLIM, the mixed infections with T. Vaginalis and B. Vaginosis, Candida and B. Vaginosis, and Candida and T. Vaginalis were observed among 0.9%, 1.3%, and 1.7% of patients respectively. In our study Squamous cell carcinoma (SCC) was seen in 0.9% of patients; Atypical Squamous Cells of Undetermined Significance (ASC-US) was seen in 1.3% of patients; and Atypical Squamous Cells cannot exclude High grade squamous intraepithelial lesion (ASC-H) was seen in 1.3% of patients. Among 3.4% and 2.6% of patients Pap smear examination was normal and unsatisfactory respectively(Table 3 and Figure 3).

Table 3: Spectrum of diseases among of study subjects on Pap smear examination

Diseases	Frequency	%
NILM	949	90.4
Atrophic	81	7.7
Inflammatory (Non-specific)	559	53.3
Candidiasis	86	8.2
Trichomoniasis	87	8.3
Actinomycosis	9	0.9
Bacterial Vaginosis	86	8.2
Mixed infections (T. Vaginalis and B. Vaginosis)	9	0.9
Mixed infections (Candida and B. Vaginosis)	14	1.3
Mixed infections (Candida and T. Vaginalis)	18	1.7
Squamous cell carcinoma (SCC)	9	0.9
ASC-US	14	1.3
ASC-H	14	1.3
Normal	36	3.4
Unsatisfactory	27	2.6

NILM: Negative for intraepithelial lesion or malignancy; ASC-US: Atypical Squamous Cells of Undetermined Significance; ASC-H: Atypical Squamous Cells cannot exclude High grade squamous intraepithelial lesion.
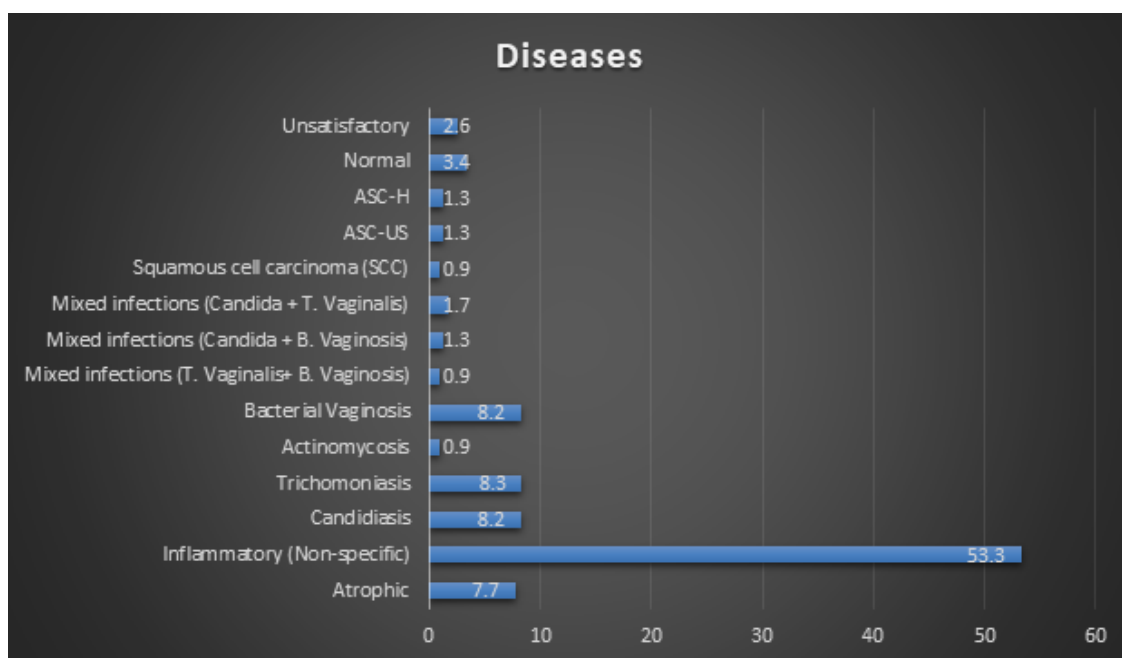
Figure 3: Spectrum of diseases among of study subjects on Pap smear examination

Discussion

The establishment of screening programmes resulted in a significant decline in the incidence of cervical cancer, which is a well-known fact [10]. Both primary and secondary preventive measures are available. Changes in sexual behaviour and immunisation against the human papilloma virus are two primary modalities. Visual examination of the cervix, cervicoscopy, HPV testing, and cytology are examples of secondary prevention for cervical cancer. The aim of a Pap test is to detect premalignant and malignant lesions that may require further treatment. In developed nations, cervical cancer incidence and mortality have decreased by 50–70% due to Pap smear-based screening approaches.[11]

The sensitivity of a Pap smear is modest (44–74%), with excellent specificity (95%). Modern procedures, such as liquid based cytology (LBC), minimise the frequency of insufficient smears, although they are costly.[12] In our study, most of the patients were in the 31-40 years of age group (35.0%). Studies by Shashidhar et al., Shaki et al., and Suma et al., and Varghese et al., have also showed that the common age group of patients was 31-40 years.[13,14,15,16]

In our study, the most common presenting symptom among the patients who underwent Pap smear examination was vaginal discharge (34.8%), pain in abdomen (15.9%)and menorrhagia (18.0%). Similarly, vaginal discharge was the predominant symptom in the studies ofRajput et al., (73.5%) and Nikumbh et al., (69.3%), and Bhojani et al., (46.5%). [17,18,19]

The comprehensive health care provided to women includes pap smears. In addition to being a tool for cancer diagnosis, it is also used to classify the hormonal pattern and to identify infections including trichomonas, herpes, and HPV.[18] In our study, the Pap smear examination showed that the Inflammatory (Non-specific) was the most common observation (53.3%). Also, in the studies by Nikumbh et al., Bhojani et al., and Vaghela et al., non-specific inflammatory smears formed the majority of cases in the studies of [18,19,20] In our study, the Atrophic Pap smear was seen in 7.7% of patients which was lower in present study compare to study done by Spinilla et al., (72.9%) as that study included the only post-menopausal group.[21]In our study, among 3.4% of patients Pap smear examination was normal which was lower when compared to the studies by Mital et al., and Shashidhar et al. [13,22] In our study, the Pap smear examination showed that 90.4% of patients were NLIM and SCC was seen in 0.9% of patients; ASC-US was seen in 1.3% of patients; and ASC-H was seen in 1.3% of patients. A similar spectrum of diseases was observed in the studies by Tailor et al.,

and Kothari et al., which show total prevalence of epithelial abnormality of 1.89% and 1.32% respectively.[23,24]Colposcopy is frequently recommended when abnormal cells are discovered in a Pap screen, and colposcopic biopsies may then be performed. Cervical cancer is prevented from developing later on by early detection and treatment of cervical cancer precursors. The failure of routine screening programmes is most likely to be accountable for the detection of SCC.

The false negative rate for a conventional Pap test was reported to be between 14 to 33%, with sampling and slide preparation limitations accounting for nearly two thirds of the rate. [25] These restrictions may result in inaccurate and imprecise diagnosis. In our study, among 2.6% of patients Pap smear examination was unsatisfactory (inadequate).Because the squamo-columnar connection was inaccessible, this occurred. Similar unsatisfactory smears were also seen in studies by Vaghela et al., (4.8%), Bamanikar et al., (5.7%), Rajput et al., (4.5%)andThomas et al., (5.8%).[17,20,26,27]

To reduce the prevalence of cervical cancer in our country, there is an urgent need for community education on how to prevent the disease by giving free HPV vaccinations and cervical cancer screenings to adolescent girls. People should be informed about the advantages of getting a Pap test by medical professionals. The limitations of Pap smear screening in India include women who do not participate in routine screening programmes due to lack of knowledge and education about prevention through screening, cultural taboos regarding sexually transmitted diseases (STDs), a lack of family support, and low socioeconomic status (SES). Inadequate smears, poor follow-up and treatment, and failure to advise patients that prevention is superior to treatment are all possible errors made by clinicians. Pathologists may interpret smears incorrectly, and many places lack cytotechnologists for staining and smear interpretation. Finally, health care systems are hampered by a lack of equipment and funding to carry out screening programmes.[18]

Conclusion

The significance of Pap smear screening for the early identification of cervix premalignant and malignant lesions was highlighted by this study. The pattern of cervical cytological abnormalities and the detection of common HPV strains in cervical cancer in the Indian population will need to be determined by larger research. Early diagnosis of cervical premalignant lesions with a proper Pap screening programme can reduce the incidence of invasive cervical cancer.

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