

Original research article

Study to evaluate the pattern of cervical Pap smear cytology and its correlation with clinical findings

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Abstract

Background: Cancer cervix is a leading cause of mortality and morbidity in developing countries like India most probably due to lack of proper screening facilities in the rural and suburban areas or due to the lack of awareness amongst the women of developing countries. Cervical cancer is the fourth most common cancer in the world. Developing countries accounted to about 80% of the global burden.

Aim: The aim of the study to evaluate the pattern of cervical Pap smear cytology at a tertiary hospital and to correlate it with clinical findings.

Material and Methods: The prospective study was carried out at Dept. of Pathology Government Medical College, Bettiah, West Champaran, Bihar, India for one year. The cellular material obtained on the spatula and cytobrush was quickly smeared on a clean glass slide, labelled, fixed in 95% ethyl alcohol immediately and subsequently stained by Pap stain. After staining, slides were mounted with DPX (Dibutylphthalate Polystyrene Xylene), screened and reported by cytopathologist under light microscope.

Results: Total 1200 cervico-vaginal smears studied during study period on patients, ranging from 18 to 65 years. Cytological findings broadly classified into unsatisfactory smears, normal and abnormal smears. There were 910(75.83%) abnormal Pap smears (benign cellular changes of inflammation as well as Epithelial Cell Abnormalities (ECA), with 265(22.08) normal cases and 25 (2.08%) unsatisfactory or inadequate samples. The age range of patients with epithelial cell abnormality was 22 to 65 years and the mean age was 44.1 ± 12.7 years. They represented 2.5% of abnormal Pap smears and 1.67% of total smears taken. Total 623 (51.92%) showed inflammatory lesion, 14 (1.17%) showed atrophy, 10 (0.83%) showed ASCUS, 6 (0.5%) showed ASC-H, 6 (0.5%) showed HSIL, 2 (0.17%) showed SCC, 3 (0.25%) AGUS, 193 (16.08%) showed metaplasia, 2 (0.17%) had radiation changes.

Conclusion: Proper implementation of Pap screening programme, incidence of invasive cervical malignancy can be prevented due to early detection of cervical premalignant lesions.

Keywords: HSIL, DPX

Introduction

Carcinoma cervix is one of the leading causes of death of the female population in developing countries. According to Global cancer statistics 2018, cervical cancer is the fourth most

frequent cancer in women with an estimated 570,000 new cases representing 6.6% of all female cancers. Approximately 90% of deaths from cervical cancer occurred in low- and middle-income countries. Cervical cancer ranks fourth for both incidence (6.6%) and mortality (7.5%).¹ Cervical cancer is the most common cause of cancer related deaths among women in developing countries. Mortality due to cervical cancer is also an indicator of health inequalities, as 86% of all deaths due to cervical cancer are in developing countries, low- and middle-income countries. Every year in India, 122,844 women are diagnosed with cervical cancer and 67,477 die from the disease. India also has the highest age standardized incidence of cervical cancer in South Asia at 22, compared to 19.2 in Bangladesh, 13 in Sri Lanka, and 2.8 in Iran.² India has a national programme for cancer since 1975, when the emphasis was on equipping premier cancer institutions. In 2010, cancer control became a part of a more comprehensive, larger programme on non communicable disease called National Programme for Prevention and Control of Cancer.³ The Papanicolaou (Pap) smear was introduced in 1941 and became the standard screening test for cervical cancer and premalignant lesions.⁴ Cervical cancer is the most common cancer among women after breast and colorectal cancer in the world, but in developing country like India it is the leading cause of mortality and morbidity. Women in these countries usually present to the clinic only when they have symptoms, such as pain, discharge, and/or abnormal bleeding. Nearly 4 lakh new cases of cervical cancers are diagnosed annually worldwide and 80% of them are diagnosed in the developing countries.⁵ Cervical cancers can be prevented through early detection by means of effective screening techniques. Cervical Pap smear is a sensitive test for early screening of the cervical lesion. Though Pap smear is just a routine screening test, the overall sensitivity in detection of premalignant lesions like high grade squamous intraepithelial lesion (HSIL) is 70-80% and has been proved very effective in differentiating between inflammatory, premalignant and malignant lesions.⁶ Thus the epithelial changes can be treated, preventing the cervical cancer.⁷ In 1988, the Bethesda system of terminology has been introduced to sub-classify the lesions into high grade and low grade squamous intraepithelial lesions (SIL) for Pap smear reporting and some studies reported comparison of various terminologies.^{8,9} The present study is intended to evaluate the pattern of cervical Pap smear cytology at a tertiary hospital and to correlate it with clinical findings.

Material and methods

The prospective study was carried out at Dept. of Pathology, Government Medical College, Bettiah, West Champaran, Bihar, India for one year.

Methodology

Total 1200 patients were screened. The patients were in the age range of 18-65 years, having complaints like vaginal discharge, bleeding per vagina or something coming out per vagina, post-coital bleeding, intermenstrual bleeding, and pain in lower abdomen. History and symptoms along with parity were recorded. Smears were taken by trained technician using modified Ayres wooden spatula which was inserted and rotated 360 over cervix. Both endocervix and exocervix were sampled. The cellular material obtained on the spatula and cytobrush was quickly smeared on a clean glass slide, labeled, fixed in 95% ethyl alcohol immediately and subsequently stained by Pap stain. After staining, slides were mounted with DPX (Dibutylphthalate Polystyrene Xylene), screened and reported by cytopathologist under light microscope according to the 2014 Bethesda System.

Results

Total 1200 cervico-vaginal smears studied during study period on patients, ranging from 18 to 65 years. Cytological findings broadly classified into unsatisfactory smears, normal and abnormal smears. There were 910 (75.83%) abnormal Pap smears (benign cellular changes of

inflammation as well as Epithelial Cell Abnormalities (ECA), with 265(22.08) normal cases and 25 (2.08%) unsatisfactory or inadequate samples.

The age range of patients with epithelial cell abnormality was 22 to 65 years and the mean age was 44.1 ± 12.7 years. They represented 2.5% of abnormal Pap smears and 1.67% of total smears taken.

Total 623 (51.92%) showed inflammatory lesion, 14 (1.17%) showed atrophy, 10 (0.83%) showed ASCUS, 6 (0.5%) showed ASC-H, 6(0.5%) showed HSIL, 2 (0.17%) showed SCC, 3 (0.25%) AGUS, 193 (16.08%) showed metaplasia, 2 (0.17%) had radiation changes.

Table 1: Age wise distribution of total number of patients.

Age	No. of patients	Percentage
Below 30	21	1.75
30-40	168	14
40-50	409	34.08
50-60	351	29.25
Above 60	251	20.92

Table 2: Cytological findings

Diagnosis		No. of cases	Percentage	
	Normal	265	22.08%	
NILM	Inflammatory	Non-specific	623	51.92%
		Candida	47	3.92%
		Trichomonas	9	0.75%
	Reactive	341	28.42%	
	Metaplasia	193	16.08%	
Atrophy		14	1.17%	
Radiation		2	0.17%	
ASCUS		10	0.83%	
ASC-H		6	0.5%	
HSIL		6	0.5%	
SCC		2	0.17%	
AGUS		3	0.25%	

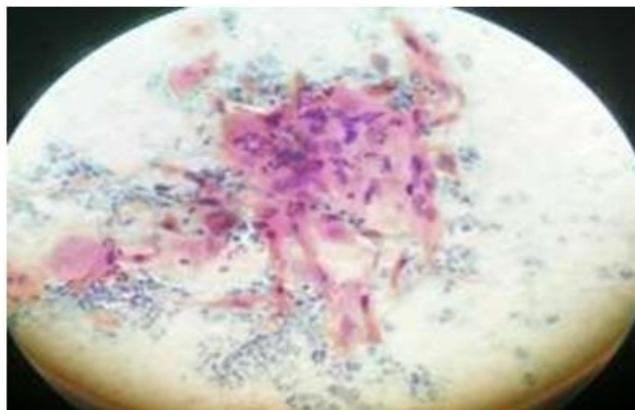


Figure 1: Invasive Squamous Cell Carcinoma

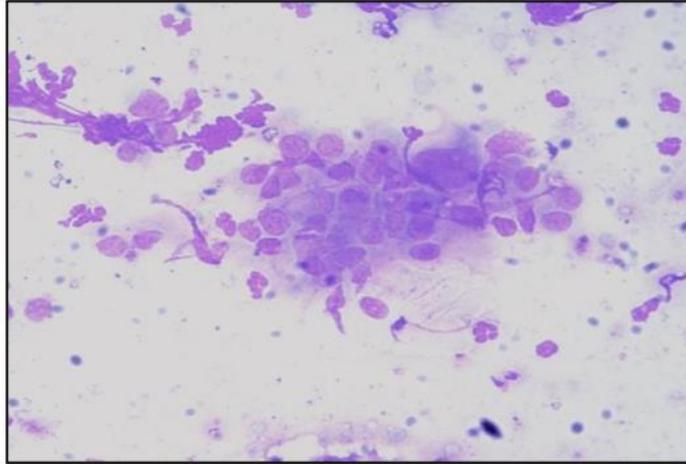


Figure 2: HSIL- High grade squamous intraepithelial lesion

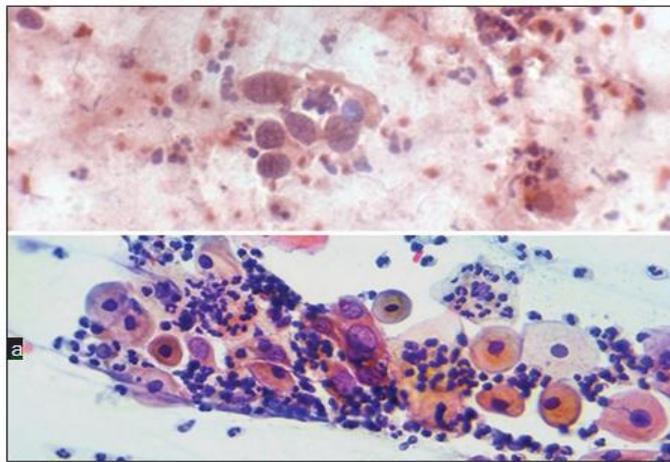


Figure 3: (a and b) Papanicolaou stain, × 400, conventional Pap smear showing high-grade squamous intraepithelial cell lesion with atypical parabasal cells

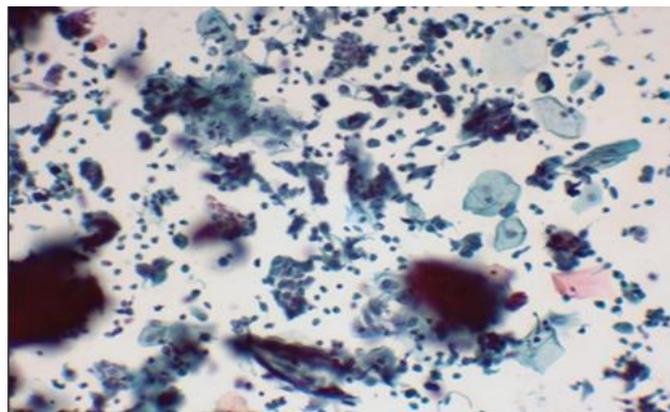


Figure 4: Papanicolaou stain, × 200, liquid-based cytology Pap smear showing squamous cell carcinoma with atypical squamous cells

Discussion

Changes in life styles and demographic profile in developing countries, non-communicable diseases are emerging as an important health problem which demand appropriate control program before they assume epidemic proportion. Of which cancer of uterine cervix and breast

are the leading cause of malignancies seen in females of India. Hence there is need of an effective mass screening program aimed at specific age group for detecting pre-cancerous condition before they progress to invasive cancer. Worldwide pap smear examination of cervix has been accepted for early detection of pre-cancerous lesions of cervix.^{10,11} Cancers of uterine cervix and breast are the leading malignancies seen in females of India. There should be an effective mass screening programme aimed at specific age group for detecting precancerous condition before they progress to invasive cancers.^{12,13} Cervical cytology is currently widely used as the most effective cancer screening modality. Objective data from hospital-based studies are required in order to detect the efficiency of the screening test. This study contributes to assessing current levels of cervical screening in the tertiary teaching hospital in Bihar, India. In our study, the mean age of patients with abnormal smears was 44.1 ± 12.7 years. Similar finding was detected by other studies.^{14,15}

This study determines 265 cases (22.08%) of normal findings, inflammatory lesions in 679 cases (56.58%). The Epithelial Cell Abnormality (ECA) rate, that is the total of ASCUS, ASC-H, LSIL, HSIL, AGUS and carcinoma diagnosis varied between 1.5 and 12.60% in various studies.^{16,17}

Our study revealed ASCUS (0.83%) to be the most common epithelial cell abnormality, most of found in age group of 30-50 years of age. Similar results were obtained in other studies which also concluded ASCUS to be the most common epithelial cell abnormality.^{17,18} ASCUS progresses to LSIL, HSIL and SCC. AGUS progresses to adenocarcinoma.^{18,19} Edelman et al, studied Pap smears from 29295 females over a period of one year and the Pap smear abnormalities were as follows: 9.9% ASC-US, 2.5% LSIL, 0.6% HSIL, and 0.2% invasive cancer.²⁰ Study by Banik U revealed the following scenario: 0.18% ASCUS, 0.12% Atypical glandular cells (AGC), 6.36% LSIL, 1.18% HSIL and 0.35% malignancy.

In our study shows ASCUS 0.83%, ASC-H 0.5%, HSIL 0.5%, SCC 0.17% and AGUS 0.25%. One of the significant discrepancies between our study and the previously published data from other countries is the higher rate of ASC-US and lower rate of LSIL. We assume that as the women included in our study were routinely screened and/or re-screened, they presented with an early form of cytological interpretation in the cervical smear, and thus, ASCUS rate was higher. Most common age to develop carcinoma cervix is between 40 and 50 years and the precursor lesions occur 5-10 years prior to developing invasive cancer. Various screening test for cervical cancer like Pap smear, liquid Pap cytology, automated cervical screening techniques, visual inspection of cervix after Lugol's Iodine and acetic acid application, speculotomy, cervicography should be started for early detection of premalignant lesions.

Conclusion

This study emphasized the importance of Pap smears screening for early detection of premalignant and malignant lesions of cervix. Larger studies are required to estimate the pattern of cervical cytological abnormalities along with detection of common HPV strains in cervical cancer in Indian population. Proper implementation of Pap screening programme, incidence of invasive cervical malignancy can be prevented due to early detection of cervical premalignant lesions.

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