Original Article

Pap Smear Test as Screening Tool for the Prevention of Carcinoma Cervix- An Institutional Study

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ABSTRACT

Background: Cervical cancer has become the leading cause for mortality in women worldwide, especially indeveloping countries, estimated to be the fourth common cancer among women. Present study was done with an aim to observe the effectiveness of Pap Smear Screening for detection of precursor pre cancerous lesions of the cervix and Prevention of Cervical Cancer at Kolkata, India.

Methods: The present study is a retrospective study done in the department of Pathology ESI-PGIMSR, MedicalCollege and Hospital, Joka, Kolkata for a period of one year. The smears were taken with sterile Ayer's spatula. Both ectocervix and endocervix were sampled. Materials were smeared on a pre-labelled glass slides to form a monolayer thick smear. Slides were fixed with methanol, which after drying were stained by rapid pap method. The conventional smears were screened and reported according to The Bethesda system 2001.

Results: Out of total 110 smears, inflammatory smear was the most common abnormality Other lesions like Low grade squamous intraepithelial lesion (LSIL), High grade squamous intraepithelial lesion (HSIL) and Atypical squamous cells of undeterrmined significance (ASCUS) were observed. Age group between 41-50 years contributed highest number of cases followed by age group between 31-40 years.

Conclusion: Pap smear testing is a very useful, simple, economical, and safe tool for detecting precancerous lesions of the cervix . The Pap test has been regarded as the gold standard of cervical screening programsCountries like India with predominant rural population having low socio-economic status, marriage atan early age and poor medical facility , it is a major challenge to formulate a screening program that is easily available, within existing resources, to a large section of society.

Keywords: Cervical Cancer, Pap Smear, Rural Population, Epithelial Cell Abnormalities

Introduction

Worldwide, women are more prone to breast and uterine cervix cancers because of the constant hormonal fluctuations occurring throughout the reproductive life cycle. Cervical cancer has become the leading cause for mortality in women worldwide, especially in developing countries, estimated to be the fourth common cancer among women.[1] In India, urban areas like Thiruvananthapuram, Mumbai and Delhi, breast cancer leads in the number of cases compared to peri-urban areas like Aizwal, Guwahati and Barshi, where cervical cancer is most common.[2]Every year, 122,844 womenin India are diagnosed with cervical cancer, and 67,477women die from the disease. [1]

Chennai Cancer registry recorded a 15% cases of cancer of the uterine cervix during the year 2006-2008 as compared to the other cancers.[3]Hospital-based evidence from one study during 2012-2013, recorded a total of 420 cervical cancer cases from a major centres in Hyderabad. HPV is recognized to be an important etiological agent of cervical cancer. In Eastern India, 9.9% of HPV prevalence was seen in women without cervical cancer and more HPV 18 sub-type as compared to HPV 16 was noted.[3]

While lack of basic facilities for testing is contributory, a lack of follow-up is also one of the drawbacks in our country especially in low-resource areas.[5] Despite having a higher mortality rate in India, till today there are few national screening programs in place for cervical screening of women. There was a 31% reduction in the mortality rate after cervical cancer screening by preliminary health workers in Mumbai.[6] In Kerala, screening programs met with low rates of compliance (6.9%), due to many factors like stigma associated with the screening process, fear of procedure, lack of awareness, etc.[7]

Cervical cancer is a preventable disease due to the longpreinvasive stage. Early detection and appropriate treatment are possible if robust screening is implemented. [4] Earlycervical epithelial changes can be identified by a Papanicolaou (Pap) smear test, which is the primary screening test for detection ofprecancerous cervical intraepithelial neoplasia and the earlystage of invasive cervical cancer.

Pap smear test has been a boon since its introduction as it is a sensitive, simple, safe, non-invasive and effective method for detection of pre-cancerous changes in the uterine cervix.

Cervical screening programme plays an important role in reduction of cervical cancers in developing countries.

[8] Present study was done with an aim to observe the effectiveness of Pap Smear Screening for Prevention of Cervical Cancer at Kolkata, India.

Materials and Methods
Females who visited the OPD of the Department of Obstetrics and Gynecology at ESI-PGIMSR, Medical College and Hospital, Joka, Kolkata for a period of one year were included in the present study. A Pap smear was used to screen all patients for cervical cancer .The smears were taken with sterile Ayer's spatula and rotated at 360 degrees smeared on a pre-labeled glass slides. Both ectocervix and endocervix were sampled. Slides were fixed in 95 % ethanol and the smears were sent to the department of Pathology for cytological examination. Staining was done with the Rapid Pap method and reported according to The Bethesda system 2001.Patients with visible malignant lesions of the cervix were excluded from the study .

Statistical Analysis: The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics like computation of percentages, means and standard deviations was done.

Results
In the present study the most common age group was 41-50 years followed by 31-40 years . (Table 1) Negative for intraepithelial lesion or malignancy (NILM) with inflammation/organisms was the most common finding present in 37.27% cases and in the age group of 31- 40 years. (Table 1) NILM was the second most common finding present

in 26.36% cases and in the age group of 31- 40 years.(Table 1) The most common organism was Gardnerella vaginalis (bacterial vaginosis) present in 48.78% cases , followed by Trichomonas vaginalis present in 26.82% cases.(Table 2) Mixed infection was present in 24.39% case. Atypical squamous cell of undetermined significance (ASCUS) was present in 18.18% cases and in the age group of 51- 60 years . (Table 2) Low grade squamous intraepithelial lesion (LSIL) was present in 10% cases and in the age group of 41- 50 years. (Table 2) High grade squamous intraepithelial lesion (HSIL) was present in 8.18% cases and in the age group of 41- 50 years.(Table 2)

Discussion
Unlike other cancers cervical cancer is readily preventable as it is easy to detect and treat.The main obstacle in successful cervical cancer screening program is the stigma attached to a pelvic examination in women. Nutrition and immunity play a role in controlling cervix cancer. Malnutrition leads to decreased immunity, giving the scope for the infectious organisms like bacteria, protozoa and fungi (Candida, Trichomonas, and Gardnerella) to harbor themselves in tissues altering the microenvironment of the uterine cervix. Organisms like Trichomonasvaginalis and Gardnerella vaginalis are anaerobicbacteria and their presence in the cervix increases the production of polyamines, which interact with organic acids of the cervix like succinic acid and acetic acid.

More than one million deaths amongst world's women population every year are attributed to carcinoma cervix. Cervical cancer is the second most common carcinoma seen in 15-44 years age group ,which if diagnosed early

Table 1: Age wise distribution of cases.

Age (years)	NILM	NILM with inflammation/ organisms	ASCUS	LSIL	HSIL	Total %	
21-30	4	10	-			14	12.72
31-40	12	20	01	02	01	36	32.72
41-50	10	10	09	06	05	40	36.36
51-60	02	01	09	02	02	16	14.54
61-70	01	-	01	01	01	4	3.63
Total	29 (26.36%)	41 (37.27%)	20 (18.18%)	11 (10%)	09(8.18%)	110	

Table 2: Distribution of NILM cases with organisms.

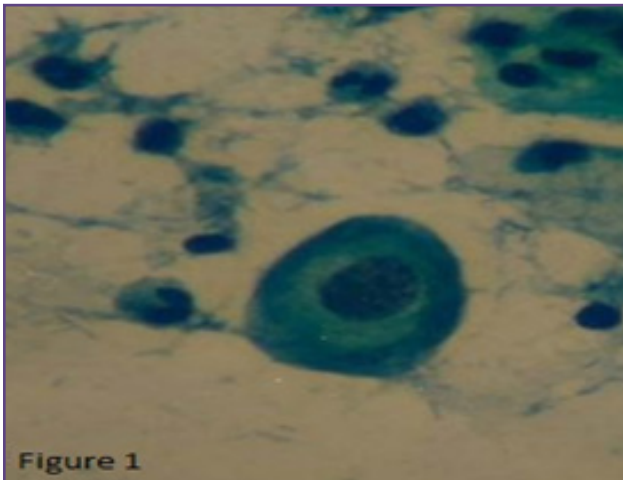| Organism	Number	Percentage %
Bacterial vaginosis	20	48.78
Trichomonas vaginalis	11	26.82
Mixed infection	10	24.39
Total	41	

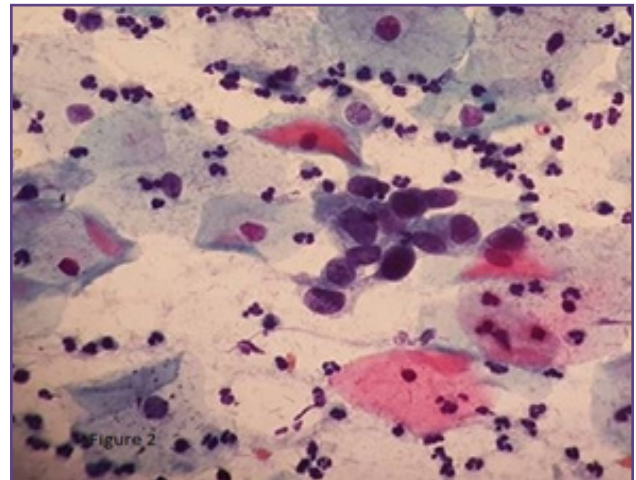Fig. 1: Smear showing a Koilocyte with thickening of the cytoplasmic borders and perinuclear halo in case of LSIL

Fig. 2: Smear shows the presence of cluster of cells with high nuclear cytoplasmic ratio, hyerchromatic nucleus, irregularly dispersed chromatin and immature cytoplasm consistent with HSIL.
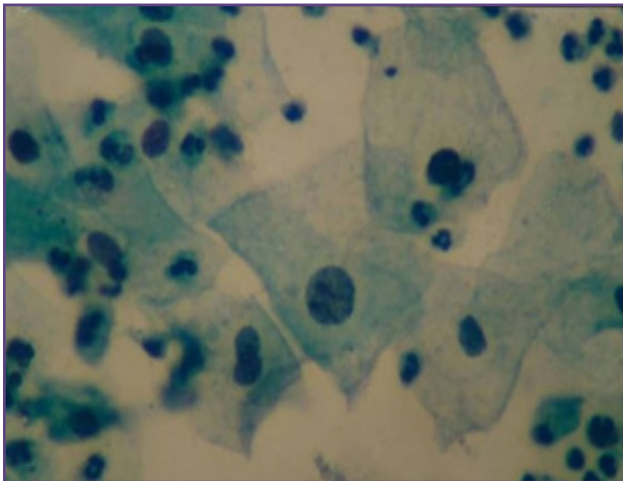

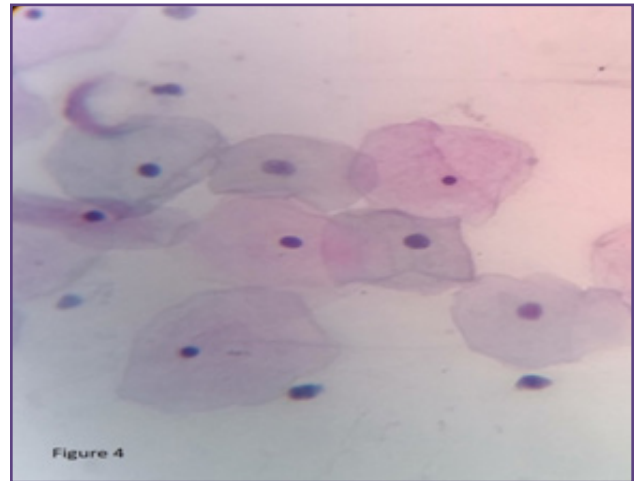Fig. 3: Smear shows marked nuclear enlargement and hyperchromasia in a case of ASCUS.

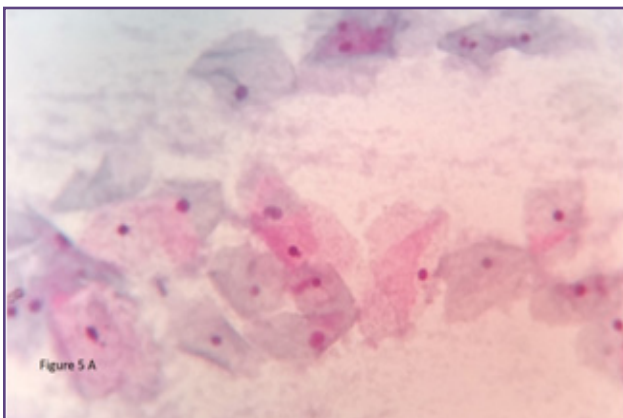Fig. 4: Smear shows presence of normal superficial and intermediate squamous cells (NILM).

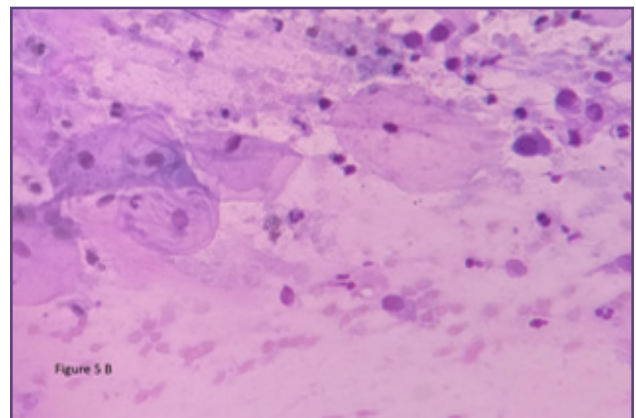Fig. 5A: Smear shows presence of bacterial vaginosis.

Fig. 5B: Smear shows presence of trichomonas vaginalis (arrow).

and treated the morbidity can be reduced by 70% and mortality by 80%.[2] Cervical smear is a sensitive, simple, safe, noninvasive and effective method for detection of pre-cancerous changes. With the changes in the life styles and demographic profiles in developing countries, non-communicable diseases are emerging as an important health problem which demand appropriate control programmes before they assume epidemic proportions. Cancer is a major cause of morbidity and mortality. According to National Cancer Registry Program of India, cancers of uterine cervix and breast are the leading malignancies seen in females of India. There should be an effective mass screening program aimed at specific age group for detecting precancerous condition before they progress to invasive cancers [9, 10, 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 within HPV DNA test is recommended as a screening method every 5 years.[12]

In the present study, the age group with abnormal cytology was 40-60 years , similar to the other studies.[10,11,13] One another study [14] reported lower age group of 30 -39 years for abnormal cervical cytologies.

The most common age group of LSIL and HSIL in the present study was 41-50 years similar to other studies.[13,15] LSIL was seen in 10% cases (Table 1 , Figure 1) and HSIL was seen in 8.18% cases (Table 1 , Figure 2). Other studies [13, 15, 16, 17, 18] found the following rates of LSIL and HSIL respectively 5.09% and 0.48 % , 12.4 % and 5%, 5.5 % and 2.5% , 5% and 3% ,8.6 % and 3.8% .

ASCUS was seen in 18.18 % cases in the present study . (Table 1 , Figure 3) Other studies [13,16,17] found the following rates of ASCUS respectively 2.9 % . 1% and 8% . This was lower as compared to our study. NILM was present in 26.36% cases (Table 1 , Figure 4). Other studies reported 48.84% and 95% rates for NILM .[13, 17]

NILM with organisms was the most common finding in the present study found in 37.27%. (Table 1 , Figure 5). Bacterial vaginosis was the most common organism present in 48.78 % (Table 2 , Figure 5A). This was followed by trichomonas vaginalis infection present in 26.82% (Table 2 , Figure 5A). Mixed infection was present in 24.39% cases. Other studies reported 42.66% and 74.5% rates for NILM with inflammation and organisms.[13,17] Women with persistent inflammation should be treated adequately , otherwise chances of development of cervical intraepithelial lesions increases.[19]

The difference in rates could be due to sample size and racial differences in having the Pap smear test done . There are various screening test for cervical cancer like the conventional Pap smear, liquid based pap smears, visual inspection of cervix after Lugol's Iodine and acetic acid application, speculoscopy and cervicography. Out of all these, exfoliative cytology has been regarded as the gold standard for cervical screening programs. It is the most useful screening procedure for pre-malignant and malignant lesions of the cervix. However conventional Pap smearing have problems of drying artefacts, inadequate fixations, background obscuring materials like inflammation and haemorrhage and thick smears.

Carcinoma of the cervix commonly occurs in the age group of 40 – 60 years and the precursor pre cancerous lesions occur nearly ten years prior to it . Hence one Pap smear test should be done before the age of 45 years.

Conclusion

Pap smear helps in early detection and management of malignancies hence reducing mortality and morbidityPap smear examination is widely accepted screening method. The Pap test has been regarded as the gold standard of cervical screening programs. When thePap test is combined with an HPV DNA test, the sensitivityfor detection of cervical pathology is increased. The community should be educated about the Pap smear test. Thus, we have to strengthen our healthservices and health care system to include screening at primary health centres.

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