Spectrum of Cervical Lesions Detected by Pap Smear: An Experience from a Rural-Based Tertiary Care Teaching Hospital

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Abstract

Background: Routine screening test like Pap smear test can detect early changes in the cervical epithelial cells, thereby facilitating the appropriate management of the disease. The present study investigates the distribution of cervical lesions among rural Indian population from a single center. *Methods*: The cross-sectional study, conducted between 2015 and 2017, evaluated 281 cervical smears obtained from female subjects aged 20-75 yrs, suspected with abnormalities. The smears collected were subjected to Pap smear test, and interpreted according to Bethesda system of classification 2001. The subjects were grouped based on the age as: 20-40 yrs, 41-50 yrs, 51-70 yrs, and 71-80 yrs, and the age-wise distribution of various types of cervical lesions was evaluated. *Results*: Out of the 281 smears; abnormal, atrophic, and normal smears were noted in 89.67%, 5.69%, and 4.62% respectively. Smears negative and positive for intraepithelial lesions or malignancies were noted in 76.86%, and 12.81% of the cases respectively. AGUS, LSIL, HSIL, and SCC were more frequent in women belonging to >50 years of age. *Conclusion*: The present study showed higher incidence of intraepithelial lesions in elderly women (>50 yrs) compared to other age groups.

Keywords: ASCUS; HSIL; NILM; Pap Smear; SCC.

Introduction

Cervical cancer is one of the prevalent causes of cancer-related death among women in developing countries. It is the fourth leading cancer among women worldwide, and the second most prevalent cancer in women aged between 15 and 44 years [1,2].

According to the National Institutes of Health fact sheet, cervical cancer accounts for ~3,00,000 deaths across world per year [1].

Annually, around 1,22,844 new cervical cancer cases are being diagnosed in India, with about 67,477 deaths being reported [3].

Similar to other cancers, cervical cancer can be prevented by detection and treatment at the pre-invasive stage. Routine screening is essential, since most of the symptoms of cervical cancers are manifested during the late stages [4,5].

Periodic screening for cervical lesions by Papanicolaou (pap) smear test can detect early stages of dysplasia [6].

Pap smear represents a spectrum of intraepithelial lesions including mild-to-severe dysplasia and invasive cancer [7].

The widespread use of Pap test over 8.2 decades has resulted in a decline in death due to uterine cancer by more than 80%, among the US population [8].

However, the lack of awareness and routine screening programs in developing countries like India, has led to increased mortality associated with late diagnosis of the disease [5,9].

The average age for developing cervical cancer among Indian women has been estimated to be 55-59 years [10].

Due to the low measures of health and living standard, rural Indian women are vulnerable to develop cervical cancer. The present study attempted

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to evaluate the cervical cytological abnormalities found through cervical smear testing among of diverse age groups belonging to a rural setting in India.

Materials and Methods

The cross-sectional study was conducted at the Department of pathology, Vinayaka Missions Medical College and Hospital, Karaikal, Puducherry, India, between November 2015 and January 2017. The study involved cervical smears obtained from female subjects belonging to 20-75 yrs of age, presented with lower abdominal pain, vaginal discharge, post-menopausal bleeding, intermenstrual bleeding, and for routine check-ups with no previous reported complaints. Atrophic, normal and abnormal smears were included. Smears that were unsatisfactory, inadequate, or those obscured with blood and neutrophils were excluded from the study. The study was approved by institutional ethics committee and informed consents were obtained from all the participants.

Cervical smear samples were collected from portio of the cervix and squamocolumnar junction, using Ayres spatula and cytobrush by the gynaecologist, at the Department of Obstetrics and gynaecology. The specimens were smeared on a clean glass slide, and immersed in Coplin jars containing preservatives and fixatives. These smears were stained using Papanicolaou stain and studied under the microscope by a pathologist at the Department of pathology. The smears were interpreted according to Bethesda system of classification 2001[11]. The subjects were grouped based on the age as: 20-40 yrs, 41-50 yrs, 51-70 yrs, and 71-80 yrs, and the age-wise distribution of various types of cervical lesions were studied.

Results

Out of the 300 smears screened for cervical lesions, 3 were unsatisfactory, 12 were inadequate, and 4 were obscured with blood and neutrophil cells. Hence a total of only 281 smears were considered for the study. Among the 281 smears studied, abnormal smears were most prevalent with 252 (89.67%) reported cases, and only 13 (4.62%) smears were normal. Atrophic smears were noted in 16 (5.69%) samples, mostly belonging to 51-70 yrs age group (8 cases). Similar number (8 cases) was noted as normal smears, belonging to 20-40 age group. Majority of the abnormal smears were negative for intraepithelial lesions or malignancies (NILM). Intraepithelial lesions were negative in 216 (76.86%) smears, and positive in 36 (12.81%) smears (Table 1).

Out of the 252 abnormal cases, non-specific inflammatory lesions were noted in 211 (75.08%) cases, with maximum number (38.79%) and minimum number (0.35%) of smears noted in the age group 20-40 yrs and 71-80 yrs respectively. Specific inflammatory smears were noted only in 5 (1.77%) cases belonging to 20-40 yrs age group, out of which moniliasis was noted in 4 (1.42%) cases, and trichomonas infection in only one case (0.35%).

Atypical squamous cells of undetermined significance (ASCUS) were noted in 31 (11.03%) smears, belonging to the age group 30-75 yrs. One smear each of (0.35%) a typical glandular cells of undetermined significance (AGUS), low-grade squamous intraepithelial lesions (LSIL), and squamous cell carcinoma (SCC) of cervix were diagnosed in subjects belonging to 60, 53, and 60 yrs old females. High-grade squamous intraepithelial lesions (HSIL)were noted in two (0.71%) smears of females belonging to 40, and 59 yrs of age (Table 2).

Table 1: Distribution of samples with various Pap smear cytodiagnosis

Types	No. of cases	Percentage (%)
Normal smear	13	4.62
Atrophic smear	16	5.69
Abnormal smear	252	89.67
Negative for intraepithelial lesions or malignancies	216	76.86
Non-specific inflammation	211	75.08
Monilias (candida) infection	4	1.42
Trichomonas infection	1	0.35
Positive for intraepithelial lesions or malignancies	36	12.81
ASCUS	31	11.03
AGUS	1	0.35
LSIL	1	0.35
HSIL	2	0.71
SCC	1	0.35

Table 2: Age-wise distribution of various cytological observations

Age group (yrs)	Normal smear*	Atrophic smear*	Non-specific inflammatory smear*	Specific inflammatory smear*	ASCUS*	AGUS*	LSIL*	HSIL*	SCC*
20-40	8 (2.84)	-	109 (38.79)	5 (1.77)	6 (2.13)	-	-	1 (0.35)	-
41-50	4 (1.42)	2 (0.71)	66 (23.48)	-	12 (4.27)	-	-	-	-
51-70	1 (0.35)	8 (2.84)	35 (12.45)	-	12 (4.27)	1 (0.35)	1 (0.35)	1 (0.35)	1 (0.35)
71-80	-	6 (2.13)	1 (0.35)	-	1 (0.35)	-	-	-	-

*No. of cases (percentage)

Discussion

The present study has noted that early stages of dysplasia like AGUS and LSIL were more predominant among women belonging to postmenopausal age group. Women of both postmenopausal age and reproductively-active groups were detected to have HSIL. Squamous cell carcinoma was the only cervical cancer diagnosed in the study, noted in around 0.4% of females in their post-menopausal period. However, the study by Tahera et al. in Indian population has reported that LSIL and HSIL were more common in females in their 40's, and carcinoma for females in their 50's, however in the present study only one case of HSIL had been reported in a female of 40 years of age. However, these results should be interpreted cautiously by considering the low sensitivity of Pap smear testing. We did not have the opportunity to validate these results with other more sensitive tests.

The study by Bisht et al. concurs with the present findings. The study had reported that all smears positive for malignancy belonged to women >50 years of age. Studies have reported rare detection of adenocarcinoma by Pap test. Similarly, the present study didn't report any case of adenocarcinoma [12,13].

A study by Velu et al. conducted in rural Indian settings has reported clinically significant lesions in 17.8% of the symptomatic females. Analogous to this finding, the current study has noted such lesions in 12.8% cases. The study has reported SCC in 3.2% of the cases, whereas in the present study, the incidence rate was only 0.35%.

The study has also reported AGUS as the least prevalent intraepithelial lesion. This observation is similar to the present study that noted AGUS and LSIL as the least prevalent epithelial lesions [13].

Tahera et al. in 2016 has reported the incidence of NILM as 77% among 100 women between the age group of 18 to 70 years. Consistent with this observation, the present study has noted 76.86% smears with NILM. The present study has noted ASUS as the most frequent intraepithelial lesion observed in 11.03%, Literature studies have reported a similar prevalence of 10.08% and much lesser prevalence of 2% [12,14]. The present study has reported LSIL in only 0.35% of the smears, although previous studies have shown an increased diagnosis of LSIL in Pap screening [12,13]. For instance, LSIL was reported in 15% of the cases by Tahera et al. In addition, the study has reported only a single case of squamous cell carcinoma, similar to the present study finding.

Even though the present study has noted Candida as the most common organism involved in 1.42% cases, studies has reported least cases of infection with Candida, with *Trichomonas vaginalis* infection being reported in 9% of the cases [12].

A study by Bisht M et al., has observed 2.10% smears as normal, comparable to the present study reporting 4.62% normal smears. In addition, 14.84% slides were labelled as positive for epithelial lesions, similar to the present study reporting 12.81% smears as positive.

In concurrence to the present findings, Bisht et al. have reported that smears showing atrophic changes and inflammatory changes, belonged mainly to patients >50, and <50 years respectively. In addition, their study has revealed a statistically significant distribution of smears with epithelial cell abnormality in older age groups when compared to the young age groups. The present findings substantiate this observation.

Although the study was restricted to a single center and no further follow-up of the cases was done, we believe that this study highlights some of the important health issues related to cervical cancer in a rural Indian setting. The study suggests that the likelihood of developing cancer lesions is more in females belonging to the post-menopausal age group.

Elderly women belonging to 51-70 yrs are prone to develop cervical carcinoma compared to other age groups. Genital infections increase the risk of developing cervical cancer.

The study has not evaluated the influence of other

risk factors of cervical cancers such as high parity, and the use of contraceptives and tobacco.

Conclusion

Increased incidence of cervical premalignant lesions is noted in the rural setting. Hence routine cervical screening, like Pap smear test, should be strictly implemented among women of lower socioeconomic status. The government policies should also focus on creating cancer awareness among such women, especially those belonging to > 50 years of age.

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