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A Study on Pattern of Pap Smear Abnormalities with Respect to Age: Screening for Cervical Cancer

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ABSTRACT

Introduction: Cervical cancer is a significant cause of mortality in women worldwide. If precancerous stages are identified early and treated it is a preventable disease. A pap test is a simple, easy, painless procedure which can be carried out as an outpatient procedure to detect specific, nonspecific inflammations, precancerous and cancerous lesions.
Objective: To study the Pap smear abnormalities with respect to different age group.
Materials and Methods: Total of 923 pap smears received in the department of pathology Shimoga institute of medical sciences, Shivamogga from 1st January to 31st December 2018 were analyzed and reported according to Bethesda Classification System (2014).
Results: Out of 923 cases majority were in the age group of 31-40 years (37.38%). Most common lesions reported were Inflammatory smear (53.09%). Overall epithelial cell abnormalities were 41 cases (4.12%) out of which LSIL (1.95%) was the most common followed by ASCUS (54.5%) which were predominant in the age group of 41-50years. One case of LSIL was present below the age of 20 years. HSIL and SCC were more commonly seen in older women in the age group of 51-60 years (42.8% and 66.7% respectively).
Conclusion: Cervical cancer is known for its slow progression, easy detection by cytology is one of the key modalities in the treatment protocol. The community should be made aware about the Pap screening test through different educational activities and efforts should be intensified for screening women at an earlier age.

Key Words: Cervical cancer, Pap smear, Inflammatory smear, LSIL.

INTRODUCTION

Cervical cancer is a significant cause of mortality in women worldwide. Due to cervical screening programs there is decrease in the incidence and mortality from cervical cancer, however in developing countries like India the burden of mortality is still high. [1] Majority of cervical cancer cases and deaths related to it occur among the women who are not adequately screened and treated. [2] If precancerous stages are identified early and treated it is a preventable disease. [3] In India 122,844 women are diagnosed with cervical cancer every year out of which 67,477 women die from the disease. [4]

Human papilloma virus plays a very important role in the development of cervical cancer. [5] HPV is a sexually transmitted oncogenic virus which on exposure with cervical cells may lead to cervical carcinogenesis. [6] The burden of the disease can be reduced by targeting the women of vulnerable age group for HPV vaccination before the exposure of virus, regular screening using Pap cytology and educating regarding safe sexual practices. [7]

Georgios Nicholas Papanicolaou invented Pap smear for cervical screening for dysplasia and intraepithelial neoplasia. A pap test is a simple, easy, painless procedure which can be carried out as an outpatient procedure to detect specific, nonspecific inflammations, precancerous and cancerous lesions. Sensitivity and specificity of Pap

smear screening is 50-75% and 98-99% respectively. [8]

Cytological screening guidelines recommend pap tests starting at the age of 21 years. Until 65 years cytology screening should be done every 3 years. HPV testing should be done every 5 years from 30-65 years. For women older than 65 years screening is stopped when the result of 3 consecutive cytology screening is negative. In case of detection of precancerous lesions screening is to be continued for at least 20 years after spontaneous regression or appropriate management. [6]

OBJECTIVE:

The aim is to study the Pap smear abnormalities regarding different age group.

MATERIALS AND METHODS

This cross-sectional study was conducted at the Department of Pathology, Shimoga Institute of Medical Sciences. All the Pap smears received from 1st January to 31st December 2018 were analyzed. Age and Pap smear results of women were retrieved from the archival records in a retrospective 1-year study. The smears were conventional Pap smears and were reported according to Bethesda Classification System (2014). The slides were categorized into NILM (Negative for Intraepithelial Lesions and Malignancy) and Epithelial Cell Abnormalities (ECA). Epithelial cell abnormalities included ASC-US (Atypical Squamous Cells of Undetermined Significance), ASC-H (Atypical Squamous cells HSIL cannot be ruled out), LSIL (Low grade Squamous Intraepithelial Lesion), HSIL (High grade Squamous Intraepithelial Lesion), SCC (Squamous Cell Carcinoma), AGC (Atypical Glandular Cells).

Total of 998 pap smears were reviewed out of which 75 cases were unsatisfactory and were excluded from the study. Hence a total of 923 pap smears were included in the study. The Data collected was entered in Microsoft Excel Software and analysis was done. The results were expressed in terms of Mean and Percentage.

RESULTS

The women included in this study were between the ages of 15-85 years. Majority of the cases were in the age group of 31-40 years (37.38%) (Graph 1). Mean age was 38 years. Out of 923 cases, 387 (41.93%) were reported as NILM (Negative for Intraepithelial Lesion/Malignancy), 490 (53.09%) cases were reported as inflammatory smear and overall prevalence of Epithelial Cell Abnormality was 41 cases (4.12%) (Table 1).

Among epithelial cell abnormalities prevalence of ASC-US, AGUS, ASC-H, LSIL, HSIL, SCC and AGC were 1.19%, 0.11%, 0.11%, 1.95%, 0.76%, 0.33% and 0.11% respectively. Four cases (0.43%) were suspicious for malignancy (Table 1).

Graph 1: Age wise distribution of cases

Table 1: Frequency of pattern of Pap smear results

	Frequency (n)	Percentage (%)
NILM	387	41.93
Inflammation	490	53.09
ASCUS	11	1.19
AGUS	1	0.11
ASC-H	1	0.11
LSIL	18	1.95
HSIL	7	0.76
SCC	3	0.33
AGC	1	0.11
Suspicious	4	0.43
Total	923	100

In our study out of 923 cases most common were inflammatory smears followed by NILM and both were common in the age group of 31-40 years (38.7% and 39% respectively) (Figure 1).

Out of epithelial cell abnormalities most common lesion was LSIL (1.95%) and

it was most common in the age group of 41-50 years (44.4%) with mean age of 50 years. It was noted that one case of LSIL was present below the age of 20 years (Table 2, Figure 2).

Second most common epithelial abnormality was ASCUS which was predominant in 41-50 years age group (54.5%). HSIL and SCC were more common in older women with age group of 51-60 years (42.8% and 66.7% respectively) (Figure 2). One case each of AGUS, ASC-H and AGC was present. AGC was present in elderly age group (61-70Y). Four out of 923 Pap smears showed features suspicious of malignancy (Table 2).

Table 2: Age group and pattern of Pap smear results

Age Group	<20Y n(%)	21-30Y n(%)	31-40Y n(%)	41-50Y n(%)	51-60Y n(%)	61-70Y n(%)	>71Y n(%)	Total
NILM	4(1%)	117(30.2%)	151(39%)	71(18.3%)	31(8%)	9(2.3%)	4(1%)	387
Inf	7(1.4%)	151(30.8%)	190(38.7%)	106(21.6%)	25(5.1%)	11(2.2%)	0(0%)	490
ASCUS	0(0%)	0(0%)	0(0%)	6(54.5%)	2(18.2%)	2(18.2%)	1(9.1%)	11
AGUS	0(0%)	1(100%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1
ASC-H	0(0%)	0(0%)	0(0%)	1(100%)	0(0%)	0(0%)	0(0%)	1
LSIL	1(5.5%)	1(5.5%)	2(11.1%)	8(44.4%)	5(27.8%)	0(0%)	1(5.55%)	18
HSIL	0(0%)	0(0%)	1(14.3%)	1(14.3%)	3(42.8%)	1(14.3%)	1(14.3%)	7
SCC	0(0%)	0(0%)	0(0%)	1(33.3%)	2(66.7%)	0(0%)	0(0%)	3
AGC	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1(100%)	0(0%)	1
Susp	0(0%)	0(0%)	1(25%)	1(25%)	1(25%)	1(25%)	0(0%)	4

NILM: Negative for Intraepithelial Lesion/Malignancy; Inf: Inflammatory smear; ASC-US: Atypical squamous cells of undetermined significance; AGUS: Atypical Glandular Cell of Undetermined Significance; ASC-H: Atypical Squamous Cells HSIL cannot be ruled out; LSIL: Low-grade squamous intraepithelial lesion; HSIL: High-grade squamous intraepithelial lesion; SCC: Squamous cell carcinoma; Susp: Suspicious for malignancy.

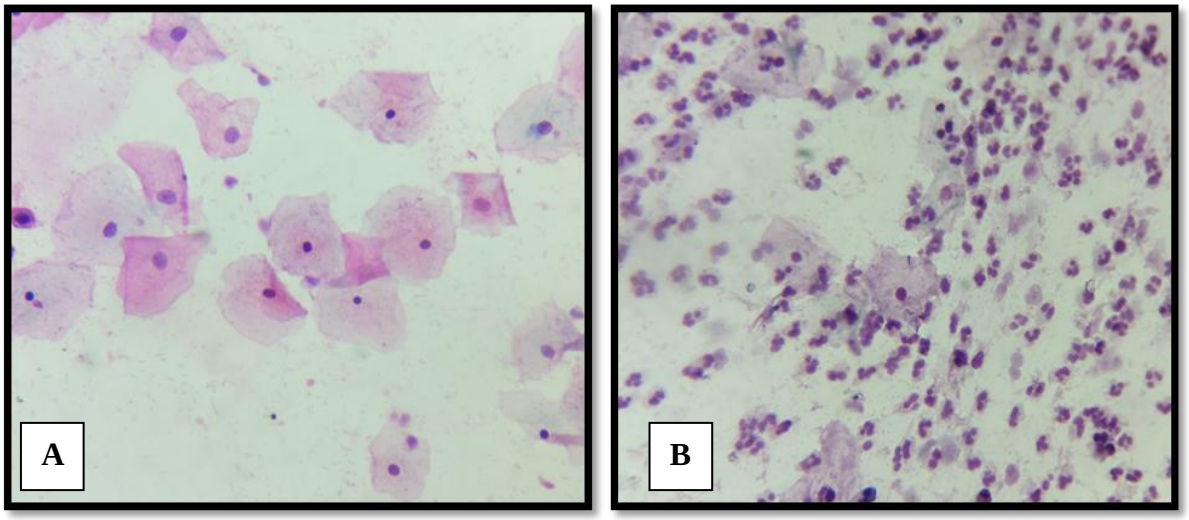
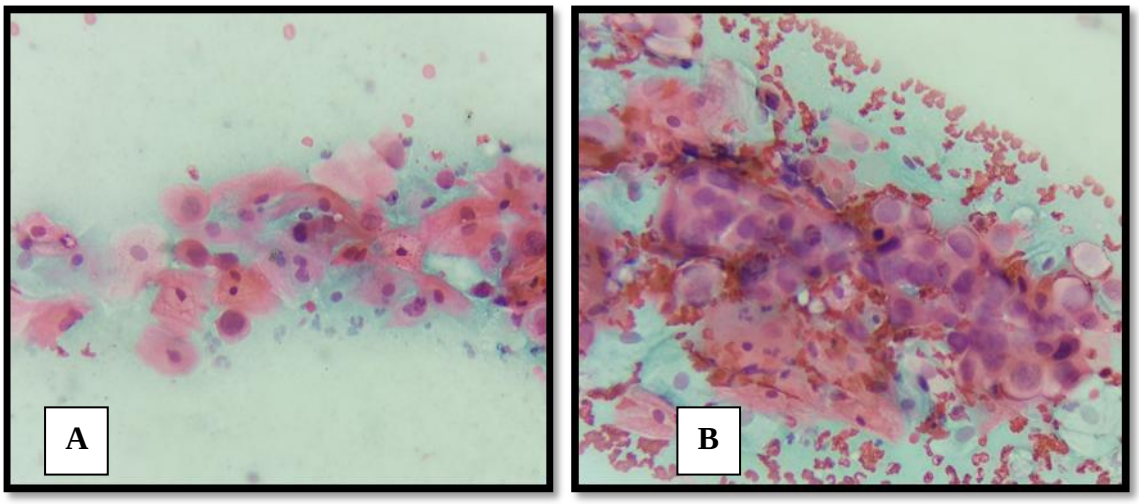


Figure 1: A) Negative for Intraepithelial Lesion/Malignancy B) Inflammatory Smear (A&B – Pap stain, 400x)



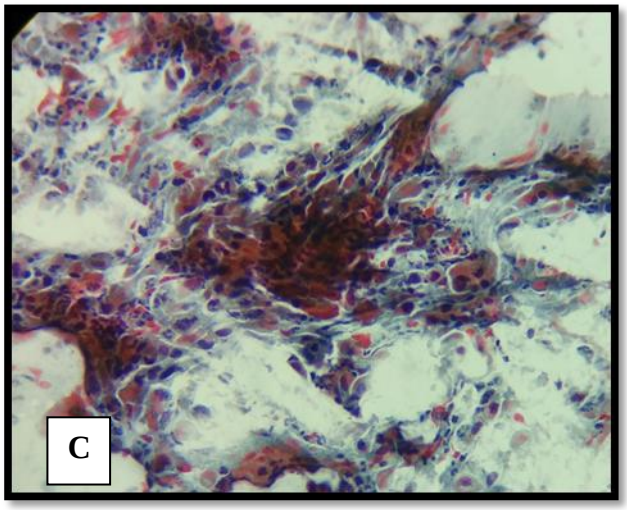


Figure 2: Epithelial Cell Abnormalities. A) Low grade Squamous Intraepithelial Lesion. B) High grade Squamous Intraepithelial Lesion. C) Squamous Cell Carcinoma. (A,B&C- Pap stain, 400x).

DISCUSSION

Papanicolaou staining of cervical smears were introduced in the 1940s in developed countries which piloted to a major decrease in rates of cervical cancer morbidity and mortality during the last half of 20th century. [9]

The incidence of cervical cancers is increasing due to poorly implemented prevention programs. Although Pap smear test is a very effective screening method to detect cervical cancer, awareness within the community is very low. [1]

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 is proposed as a screening method every 5 years. [10]

The data related to pattern of epithelial cell abnormality on Pap smear in India is less up till now, especially in postmenopausal or elderly women. Due to lack of estrogen, adequate sample cannot be obtained in older women making interpretation difficult. [3]

It takes about 10 years for persistent HPV infection to progress into dysplasia or malignancy. Due to this, women aged 30 years and older are at increased risk and hence screening is focused on this age group. [9]

In our study, majority of the patients were in the age group of 31-40 years (37.38%). This was in consistent with the study done by Bamanikar SA et al [11] and Ranabhat SK et al. [12]

Negative for intraepithelial lesion or malignancy (NILM) with non specific inflammation was reported as 53% while NILM without inflammation (normal smear) was seen in 41.9%. This was similar to the study done by Bamanikar et.al. [11] Majority of the cases of NILM and inflammatory smears were seen in the age group of 31-40 years. This is comparable with the study done Das d et al. [13]

The rate of Epithelial cell abnormality (ECA) in our study was 4.3 %, which is concordant with the study done by Bamanikar et al; [11] while Tailor et al [14] and Malpani et al [15] showed 1.89% and 2% respectively. The rate of ECA varies from 1.5% to 12.6 %. [16,17]

In the present study, LSIL was the predominant type of ECA constituted 1.95%. This was consistent with the study done by Banik et.al [18] and Malpani et al. [15]. ASCUS was the second most common type of ECA which constituted 1.19% in our study, where as Bamanikar et al [11] showed ASCUS to be the predominant type (2.32%) in their study.

Our study showed that mean age for ECA is 50 years, which is comparable with Das et al [13] in which the mean age was 53.6 years, while in Bamanikar et al, [11] mean age was 44.1 years.

In our study, LSIL and ASCUS were mostly seen in the age group of 41- 50 years. This is in accordance with study by Das D et al. [13]

In this study, SCC constituted 0.3% which is similar to the study done by Banik et al [18] and Edelman et al [19] who revealed 0.35 % and 0.2 5 respectively.

As documented in various other studies, carcinoma of the cervix is very common to occur in the 5th decade, whereas the precursor lesions occur 5-10 years before the onset of invasive malignancy. [20] Our study also revealed occurrence of majority of cases of HSIL and SCC in the age group of 51- 60 years. This was similar to the study done by Das D et al. [13]

CONCLUSION

In India cervical cancer is the most common gynaecological cancer. As cervical cancer is known for its slow progression, easy and early detection by cytology is one of the key modalities in the treatment protocol. The community should be made aware about the Pap screening test through different educational activities and efforts should be intensified for screening women at an earlier age.

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