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Study of PAP smear findings in a tertiary care teaching hospital

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Abstract
Introduction: In the past few years, the epidemiology of cervical cancer has undergone some important changes. It is ranked fourth in world and second in India in terms of its incidence. India accounts for 15.2% of total cervical cancer deaths in the world. In India, 4 out of 5 cases of cervical cancer reported are infected by HPV strains 16 and 18. Effective primary prevention with HPV vaccinations and secondary prevention by proper screening and treatment of precancerous lesions will prevent most cervical cancer cases. AIM: The present study was undertaken to determine the frequency of premalignant and malignant lesions of cervix and to study age wise incidence of various cervical lesions.
Materials and Methods: This was an observational study carried out in the Department of Pathology, B J medical college, Ahmedabad over a period of one year from August 2022 to July 2023. A total of 1003 satisfactory smears were studied. The cytological interpretation of the smears was made according to The Bethesda System 2014 (TBS).
Results: A total of 1072 smears were studied during the study period of August 2022 to July 2023. Out of these 1072 smears, 69 were inadequate or unsatisfactory. Most women were of age group between 31-40 years. Majority of patients had come with complain of leukorrhea (53.6%). Most of the patients (73.2%) were categorized into NILM (negative for intraepithelial lesion or malignancy) and the remaining had epithelial abnormalities. Among epithelial cell abnormalities, ASC-US was the commonest (13.3%) followed by LSIL (6.4%) and ASC-H (2.4%).
Conclusion: Reviewing the results of present study, it is inferred that premalignant and malignant lesion of cervix is not uncommon in our set up. PAP smear can be a safe, cheap and effective test to detect premalignant and malignant lesions in low cost settings and help in guiding clinicians for further management.

Keywords: Cervical cancer, Bethesda, pap smear

Introduction

In the past few years, the epidemiology of cervical cancer has undergone some important changes. According to WHO, in 2022 about 3,50,000 women died from cervical cancer worldwide and about 6,60,000 women were diagnosed of cervical cancer [1]. It is ranked fourth in world and second in India in terms of its incidence [2]. India accounts for 15.2% of total cervical cancer deaths in the world [3]. In India, 4 out of 5 reported cases of cervical cancer are infected by HPV strains 16 and 18 [4, 5, 6]. Risk factors for HPV infections include early age of marriage, multiple sexual partners, multiple pregnancies, poor genital hygiene and lack of awareness. Incidence of carcinoma cervix in urban population has decreased, but it's prevalence in rural population is still high [7]. The WHO, called for elimination of cervical cancer through 90%-70%-90% targets, i.e., 90% of girls below the age of 15 years be fully vaccinated against HPV; 70% of women to undergo screening for cervical cancer by the age of 35 years and subsequently by age 45 years and 90% of women diagnosed with cervical disease (precancerous/invasive cancer) receive treatment by 2030 [8]. But according to National Family Health Survey of India (2019-2021) only 1.9% of women (aged 30-49 years) have ever undergone cervical screening (2.2% in urban areas and 1.7% in rural areas) [9]. Effective primary prevention with HPV vaccinations and secondary prevention by proper screening and treatment of precancerous lesions will prevent most cervical cancer cases.

AIM

The present study was undertaken to determine the frequency of premalignant and malignant lesions of cervix and to study age wise incidence of various cervical lesions.

Materials and Methods

This was an observational study carried out on all the PAP smears received in the Department of Pathology, B. J medical college, Ahmedabad during a study period of one year from August 2022 to July 2023. A total of 1003 satisfactory smears were studied during the study period. The patient details were obtained from the clinical requisition forms and electronic data base of the department. Sampling was done using Ayre's spatula and fixed by keeping it methanol for 10 minutes. All PAP smears which were satisfactory for evaluation based on the 2014 Bethesda System for cervical cytology were included in the study. All slides were stained by modified PAP stain and examined under light microscopy by the pathologist. The cytological interpretation of the smears was made according to The Bethesda System of Reporting Cervical Cytology 2014 (TBS).

Results

A total of 1072 smears were studied during the study period of August 2022 to July 2023. Out of these 1072 smears, 69 were inadequate or unsatisfactory and were excluded from the study. Age of women ranged from 21-80 years and most of the women were of age group between 31-40 years (Table 1). 93.5% of the females who had underwent PAP smear test were parous and the rest were nulligravida. Majority of patients had come with clinical complain of leukorrhea (53.6%) (Table 2). Most of the patients (73.2%) were categorized into NILM (negative for intraepithelial lesion or malignancy) and the remaining had epithelial cell abnormalities.

Table 1: Age-wise distribution of patients

Age group (in years)	Number of patients	Percentage (%)
21-30	257	25.6
31-40	354	35.3
41-50	274	27.3
51-60	77	7.7
61-70	31	3.1
71-80	10	1
Total	1003	100

Table 2: Presenting complains of patients

Symptoms	Number of patients	Percentage (%)	Epithelial abnormality on PAP smear	Percentage (%)
Asymptomatic	226	22.5	48	4.8
Leukorrhea	538	53.6	147	14.6
Urinary complaints	10	1	2	0.2
Something coming out of P/V	31	3	14	1.4
Irregular menses	26	2.6	6	0.6
Menorrhagia	79	8	19	1.9
Dyspareunia	2	0.2	0	0
Post-menopausal bleeding	32	3.2	17	1.7
Lower abdominal pain	33	3.3	8	0.8
Infertility	7	0.7	0	0
Post coital bleeding	15	1.5	6	0.6
Genital pruritis	4	0.4	2	0.2
Total	1003	100	269	26.8

P/V- Per vagina

Table 3: Correlation of epithelial cell abnormality pap smears with presenting symptoms

	ASCUS	ASC-H	LSIL	HSIL	AGC	Squamous cell carcinoma	Adeno carcinoma	Total
Leukorrhea	67	15	44	9	9	2	1	147
Asymptomatic	33	3	6	3	3	0	0	48
Urinary complaints	1	0	0	1	0	0	0	2
Something coming out of P/V	8	0	3	2	1	0	0	14
Irregular menses	3	1	1	0	1	0	0	6
Menorrhagia	8	3	4	1	3	0	0	19
Post- menopausal bleeding	4	1	3	3	2	3	1	17
Lower abdominal pain	6	0	2	0	0	0	0	8
Post coital bleeding	3	1	0	0	2	0	0	6
Genital pruritis	1	0	1	0	0	0	0	2
Total	134	24	64	19	21	5	2	

ASC-US- Atypical squamous cells of undetermined significance; ASC-H- Atypical squamous cells cannot exclude HSIL; AGC- Atypical glandular cells; LSIL- Low-grade squamous intraepithelial lesion; HSIL- High-grade squamous intraepithelial lesion, P/V- Per vagina

Among the PAP smears which were reported as non-neoplastic, non-specific inflammatory smears (42%) were most common finding. Among the infectious conditions, 107 cases were of bacterial vaginosis followed by 43 cases of trichomoniasis and 12 cases of candidiasis. Majority of patients with non-specific inflammation, trichomoniais and candidiasis were of the age group between 31-40 years. Majority of patients with bacterial vaginosis were of the age group between 41-50 years (Table 4). A case of mixed infection with Human papilloma virus (HPV) and bacterial vaginosis and another case of mixed infection with Herpes Simplex virus (HSV) and candidiasis were reported.

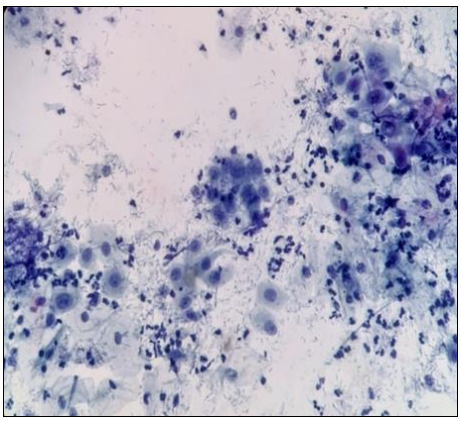

Figure 1: Photomicrograph of HSIL (PAP smear x 400)

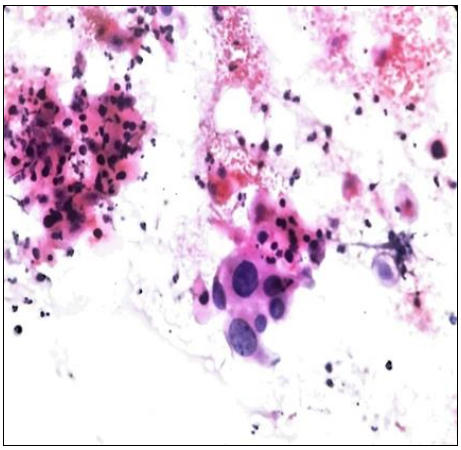

Figure 2: Photomicrograph of Squamous cell carcinoma (PAP smear x 400)

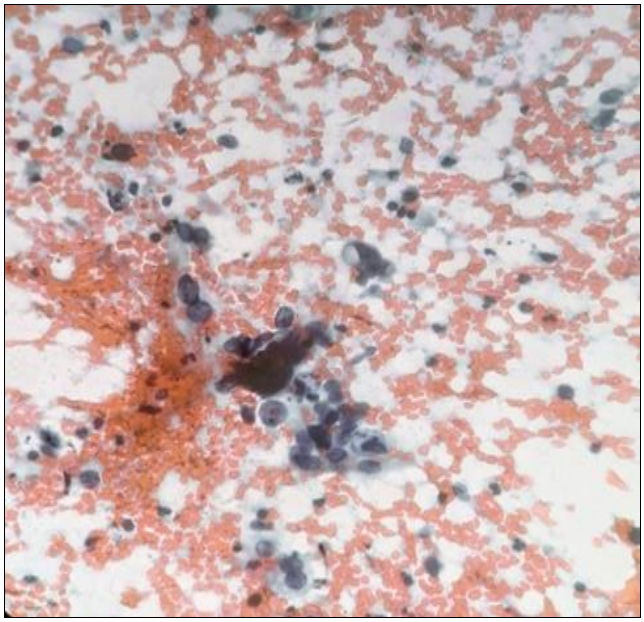

Figure 3: Photomicrograph of Adenocarcinoma cervix (PAP smear x 400)

Epithelial cell abnormalities in cytological examination were found in total 269 cases constituting 26.8%. Among epithelial cell abnormalities, ASC-US was the commonest (13.3%) followed by LSIL (6.4%) and ASC-H (2.4%). We also reported 5 cases of squamous cell carcinoma and 2 cases of adenocarcinoma in pap smear. Majority of patients with ASC-US and HSIL were of the age group between 31-40 years and majority of patients with LSIL were of the age group between 41-50 years. (Table 5)

Table 4: Distribution of pap smear findings among different Age groups

	21-30	31-40	41-50	51-60	61-70	71-80	Total
NILM without any changes	42	45	27	6	1	0	121(12%)
Non-specific inflammation	126	163	104	24	3	0	420(42%)
Bacterial vaginosis	34	35	36	2	0	0	107(10.6%)
Trichomoniasis	15	17	10	1	0	0	43(4.3%)
Candidiasis	4	5	3	0	0	0	12(1.2%)
Atrophy	0	2	12	8	7	0	29(2.9%)
Mixed infection	1	1	0	0	0	0	2(0.2%)
ASC-US	22	45	41	13	8	5	134(13.3%)
ASC-H	4	8	9	2	0	1	24(2.4%)
AGC	2	10	4	3	2	0	21(2.1%)
LSIL	6	17	23	11	5	2	64(6.4%)
HSIL	1	5	4	4	4	1	19(1.9%)
Squamous cell carcinoma	0	1	0	2	1	1	5(0.5%)
Adenocarcinoma	0	0	1	1	0	0	2(0.2%)
Total	257(25.6%)	354(35.3%)	274(27.3%)	77(7.7%)	31(3.1%)	10(1%)	1003(100%)

ASC-US- Atypical squamous cells of undetermined significance; ASC-H- Atypical squamous cells cannot exclude HSIL; AGC- Atypical glandular cells; LSIL- Low-grade squamous intraepithelial lesion; HSIL- High-grade squamous intraepithelial lesion.

Table 5: Distribution of epithelial cell abnormality pap smear findings among different age groups

	ASC-US	ASC-H	LSIL	HSIL	Squamous cell carcinoma	AGC	Adenocarcinoma	Total
21-30	22	4	6	1	0	2	0	35 (13%)
31-40	45	8	17	5	1	10	0	86 (32%)
41-50	41	9	23	4	0	4	1	82 (30.5%)
51-60	13	2	11	4	2	3	1	36 (13.4%)
61-70	8	0	5	4	1	2	0	20 (7.4%)
71-80	5	1	2	1	1	0	0	10 (3.7%)
Total	134	24	64	19	5	21	2	269 (100%)

Discussion

In the present study, majority of the patients had approached the gynecology OPD with complain of leukorrhea (53.6%) which is similar to studies by Das D. *et al* [10] (63%) and Singh A. *et al* [11] (57.44%).

Out of 1003 cases, majority of the cases were of non-specific inflammation which is similar to studies by Vijayalakshmi P. *et al* [12]. In the present study epithelial cell abnormality was found in 26.8% of cases. In studies by Vijayalakshmi P. *et al* [12] and Altaf FJ *et al* [13], epithelial cell abnormalities noted were 23.5% and 17.3% respectively, which is similar to the present study. Amongst squamous cell abnormalities, ASC-US, ASC-H, LSIL, HSIL and squamous cell carcinoma were 13.3%, 2.4%, 6.4%, 1.9% and 0.5% respectively in the present study. In the study by Altaf FJ *et al* [13], ASCUS, LSIL, HSIL, SCC were reported as 9.2%, 2.7%, 0.4% and 0.06% which is comparable with present study. Similar squamous cell abnormalities were reported in study by Vijayalakshmi P. *et al* [12] as well. Comparing different glandular abnormalities in present study, 2.1% were of atypical glandular cells and 0.2% of cases were of adenocarcinoma. Similar findings were found studies by Vijayalakshmi P. *et al* [12] and Altaf FJ *et al* [13].

Comparing age wise distribution of epithelial abnormalities in present study, maximum number of cases were reported between the age of 31-40 (32%) followed by 41-50 years (30.5%). These findings are similar to that of study by Elhakeem *et al* [14]. in which maximum cases were reported between age of 31-40 (33%) followed by 41-50 years (30.7%). The mean age of development of ASCUS, ASC-H, LSIL and HSIL were 42.1, 42.2, 45.6 and 50.3 years respectively. In study by Zubair A.A. *et al* [15], the difference of mean age of development of HSIL and LSIL was approximately 5 years similar to present study.

Conclusion

Reviewing the results of present study, it is inferred that premalignant and malignant lesion of cervix is not uncommon in our set up. Early age of marriage, multiple pregnancies, lack of awareness and unhygienic conditions might be factors indirectly contributing to it. Implementation of guidelines for a proper screening program for cervical cancer should be executed. PAP smear can be a safe, cheap and effective test to detect premalignant and malignant lesions in low cost settings and help in guiding clinicians for further management.

Conflict of Interest

Not available

Financial Support

Not available

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