Research Article

A role of cervical Pap smear as a screening tool in diagnosis of lesions of cervix—a one-year study

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Abstract

Background: Cancer of cervix is the second most common cancer in women in the world and one of the leading malignancies seen in Indian women. In India and other developing countries, cervical cancer is the most common cause of morbidity and mortality. Cancer of cervix is preventable if diagnosed at the pre-invasive stage with regular intervals of cytological screening by Papanicolaou (Pap) smears.

Objectives: This study was conducted to determine the importance of conventional Pap smears for the diagnosis of inflammatory, premalignant, and malignant lesions of the cervix.

Materials and methods: This cross-sectional study was conducted from January 2014 to December 2014 on 1808 women coming for a Pap smear examination in Government Medical College attached to New Civil Hospital, Surat. After doing Pap stain, all cases were reported as per the 2001 Bethesda system.

Results: A total of 1808 cases of Pap smears were received out of which 1563 (86.5%) cases were negative for intraepithelial lesion or malignancy, 161 (8.9%) cases were unsatisfactory or inadequate, and 84 (4.65%) cases showed epithelial cell abnormality. Out of the 1563 cases, 647 (41.39%) cases were reported to have no specific pathology, 90 (5.76%) showed changes of atrophy, 333 (21.31%) cases showed inflammatory/reactive changes, whereas organisms were seen in 493 (31.54%) cases.

Conclusion: Pap smear examination is an effective screening and diagnostic procedure for the detection of premalignant and malignant cervical lesions at an early stage, thereby helping the clinicians in more efficient management of the patients. It also suggests a need for further evaluation and follow-up.

KEY WORDS: Cervical cancer, Bethesda system, Pap smear

Introduction

Cervical cancer is the most common cancer among women in 2 out of the 12 Population Based Cancer Registries (PBCRs) in India, and has the second highest incidence rate after breast cancer in the rest of the PBCRs.[1] Sexual habits such as number of sexual partners, age of first sexual intercourse, and infection by human papilloma virus (HPV) play an important role in the pathogenesis of cervical cancer.[2] Cancer of cervix has a long latent period of about 10 years.[3] Cervical cancer starts as a precancerous condition called dysplasia also termed as cervical intraepithelial neoplasia (CIN). CIN starts at the transformation zone especially in relation to the squamous metaplasia and reserve cell hyperplasia. The lesion may disappear either after a minor diagnostic procedure or spontaneously. Hence the detection of dysplasia/CIN in an early stage is curable.[1] The Papanicolaou (Pap) test is a screening test used for cervical cancer. The Pap test was introduced by George Papanicolaou as a cervical pathology screening test in 1941.[4]Cancer of cervix is preventable by early detection of its precursor lesions by Pap screening test.[5] The addition of HPV testing to cervical cancer screening strategies has improved detection of cervical neoplasia.[6]

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Materials and Methods

This cross-sectional study was conducted at the Government Medical College attached to New Civil Hospital, Surat. A total 1808 patients from the period of January to December 2014 were included in study.

Some of the patients presented with gynecological symptoms such as discharge per vaginally, menstrual irregularities, abdominal pain, something coming out per vaginally, backache, itching, bleeding per vaginally, postmenopausal bleeding, postcoital bleeding, pruritus, infertility, and backache while others presented for either routine checkup and/or postpartum care. Smears were taken by trained technician from both ectocervix and endocervix for conventional Pap smear. Slides were prepared, labeled, fixed in 95% ethyl alcohol immediately, and subsequently stained by Pap stain. Specimen adequacy was assessed based on the presence of adequate number of squamous epithelial cells; an adequate conventional smear should contain minimum of approximately 8000 to 12,000 well-preserved and well-visualized squamous epithelial cells.[7] All the smears were reported by cytopathologists according to the 2001 Bethesda system.

Results

A total of 1808 cases of cervical Pap smears were received in our Cytology Department during the period of 1 year. Age group ranged from 18 to 90 years Out of the 1808 patients, maximum number of patients, 653 (36.1%), were in the age group of 31–40 years followed by 477 patients (26.4%) in the age group of 15–30 years. There were 437 patients (24.1%) in the 4 age group of 1–50 years, 135 (7.5%) in the age group of 51–60, 81 (4.5%) in the age group of 61–70 years, and 25 (1.4%) in the age group of 70 years and above. In our study, the mean age of patients with epithelial cell abnormality was 42.6 years (Figure 1).

In our study, 538(29.8%) patients come for routine checkup. The common presenting complaint was white discharge per vaginum (leucorrhoea) in 376 (20.8 %) followed by abdominal pain in 312 (17.3%) patients. History of irregular menstruation was present in 309 (17.1%) cases, something coming out per vaginally in 138 (7.6%) cases, burning micturation in 61 (3.4%) cases, itching in 28 (1.5%) cases, bleeding per vaginally in 29 (1.6%) cases, postmenopausal bleeding in 13 (0.7%) cases, and backache in 4(0.2%) cases (Figure 2).

On per speculum examination, we found no gross lesions in healthy cervix in 1096 (60.6%), hypertrophied or unhealthy cervix in 106 (5.9%), cervical erosion in 253 (14%), uterine decent in 258 (14.3%), cervix flushed with vagina found in 23 (1.2%), and polyp in 14 (0.8%) cases. In vault smear, vault health was found in 56 (3.1%), erosion on vault found in 1 (0.05%), and visible growth on vault were found in 1 case (0.05%).

Out of 1808 cases, 1563 (86.45%) were reported as negative for any intraepithelial lesion or malignancy. In 161 (8.9%) patients smears were unsatisfactory or inadequate for reporting and 84 (4.65%) cases showed epithelial cell abnormality.

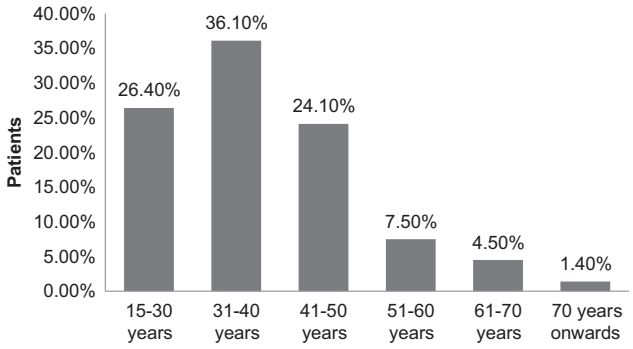

Figure 1: Column diagram showing distribution of patients according to age.

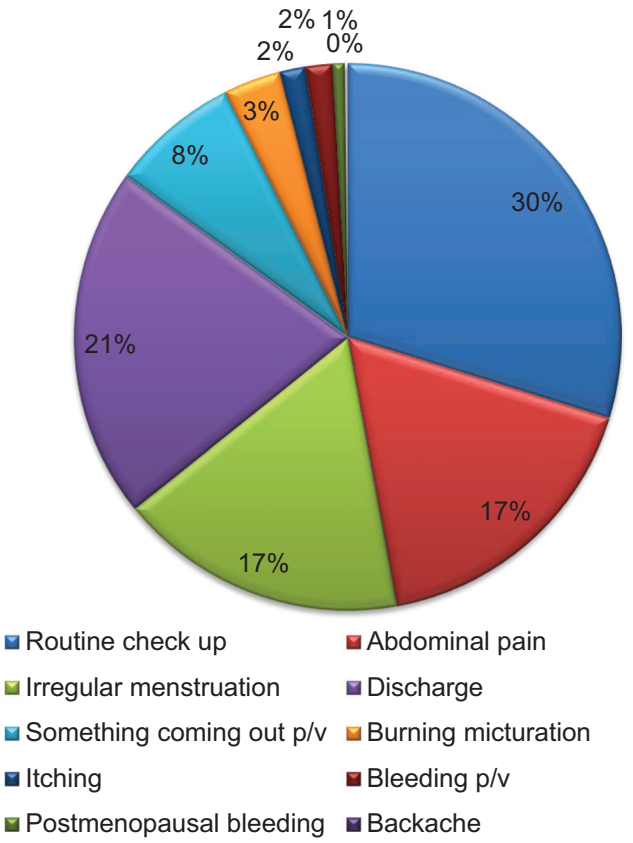

Figure 2: Pie diagram showing percentage distribution of patients according to clinical presentation.

Epithelial cell abnormality was reported in 84 (4.65%) cases including atypical squamous cells of undetermined significance (ASCUS) in 31 (1.7%), atypical squamous cell cannot exclude high grade squamous intraepithelial lesions)ASC-H) in 15 (0.8%), low-grade squamous intraepithelial lesion (LSIL)

Table 1: Pap smear interpretation by Bethesda system (2001)

Interpretation/results	Age group (years)	Number of cases (%)
Unsatisfactory or inadequate		161 (8.9%)
Negative for intraepithelial lesion or malignancy	18–90	1563 (86.5%)
ASCUS	19–70	31 (1.7%)
ASC-H	24–70	15 (0.8%)
LSIL	25–52	10 (0.6%)
HSIL	27–57	11 (0.6%)
HSIL with features suspicious of invasion	40–85	3 (0.2%)
SCC	61–70	2 (0.1%)
AGUS-NOS	33–55	8 (0.4%)
Adenocarcinoma	35–60	4 (0.2%)
Total		1808

SCC, Squamous cell carcinoma.

Table 2: Pattern of negative for intraepithelial lesion or malignancy

Category	Interpretation/Results	No. of cases (%)
I)	No specific pathology	647 (41.39%)
II)	RCC associated with nonspecific inflammation	331 (21.18%)
	RCC associated with radiation	2 (0.13%)
III)	Atrophy	90 (5.76%)
IV)	*Trichomonas vaginalis*	13 (0.83%)
	Bacterial vaginosis	362 (23.16%)
	Candida albicans	118 (7.55%)
Total		1563

in 10 (0.6%), high-grade squamous intraepithelial lesion (HSIL) in 11 (0.6%), HSIL with features suspicious for invasion 3 (0.2%), squamous cell carcinoma in 2 (0.1 %), atypical glandular cells not otherwise specified (AGUS-NOS) in 8 (0.4%) cases, and adenocarcinoma in 4 (0.2%) cases. Patients with squamous cell carcinoma were from older age group (Table 1).

Out of the 1563 smears negative for intraepithelial lesion or malignancy, 647 (41.39%) showed normal cytology findings, 90 (5.76%) showed changes of atrophy, 2 (0.13%) showed reactive cellular changes (RCC) associated with radiation, and 331 (21.18%) showed RCC associated with nonspecific inflammation. In the organisms group in our study, we noted 13 (0.83%) showed *Trichomonas vaginalis*, 362(23.16%) showed shift in flora suggestive of bacterial vaginosis, and 118 (7.55%) showed fungal organisms morphologically consistent with *Candida* species (Table 2).

Discussion

In our study, maximum number of patients 653 (36.1%) were in the age group of 31–40 years followed by 477 (26.4%) in the age group of 15–30 years.

The common presenting complaint was white discharge per vaginum (leucorrhoea) in 376 (20.8%) followed by abdominal pain in 312 (17.3%) patients. Out of the 1808 cases, 1563 (86.45%) were reported as negative for any intraepithelial lesion or malignancy. In 161 (8.9%) patients, smears were unsatisfactory or inadequate for reporting and 84(4.65%) cases showed epithelial cell abnormality.

Total 1808 cases of cervicovaginal cytology were screened in this study. Majority of the patients (36.1%) were from the age group of 31–40 years followed by 26.4% patients form the age group of 15–30 years. Similar findings were also noted by Suryawanshi et al.,[3] Shekhar et al.,[4] and Rana et al.[6] in which most common age group screened was 31–40 years and the percentage was 31.21%, 41.9%, and 43.7%, respectively.

The present study has 8.9%of unsatisfactory smears which was similar to the study done by Shrivastava et al.,[8] Sarma et al.,[1] Atla et al.[9] in which unsatisfactory smears were 8.09%, 6.6%, and 6.31%, respectively.

In our study, the mean age of patients with epithelial cell abnormality smears was 42.6 years, which is nearer to the study done by Bamanikar et al. in which it was 38.5 years. Vaginal discharge was the most common presenting complaint 376 (20.0%) in our study. Other studies also reported similar findings; Shekhar et al.[4] 31.2% and Sarma et al.[1] 70.66%.

This study determines 1563 cases (86.5%) to be negative for any intraepithelial lesion or malignancy. Other studies revealed 91.0%, 88.93%, and 96.17% cases of NILM (negative for intraepithelial lesion or malignancy), respectively.[3,5,10]

In the present study, epithelial cell abnormalities such as ASCUS, ASC-H, LSIL, HSIL, AGC, and carcinoma were noted to be 4.6%, which was comparable to the study done by Altaf et al.,[2] Shekhar et al.,[4] and Bamanikar et al.[5] in which the percentage of epithelial cell abnormality noted was 3.1%, 6.7%, and 5.36%, respectively; however, Sarma et al.[1] found higher rate of 11.95%. This may be because of widespread difference in the prevalence of risk factors and difference in availability of screening program.

ASCUS was found to be highest (48.39% [15/31]) in the age group 31–40 years, which is comparable to the study done by Shekhar et al.[4] and Rana et al.[6] in which ASCUS was reported to be 47.82% (11/23) and 58.33% (7/12), respectively. In our study, four cases of ASCUS were found in the age group of 21–30 years.

In epithelial cell abnormality, ASCUS, AGUS-NOS, and ASC-H make up 64.3% (54/84), low-grade lesions (LSIL) makes up 11.9% (10/84), the percentage of high-grade lesion (HSIL, HSIL with features suspicious of invasion), which is noninvasive cancer, was 16.7% (14/84), and the percentage of invasive squamous cell carcinoma and adenocarcinoma is 7.1% (6/84).

From the above finding we conclude that screening by Pap smear should start at the age of 21 years and above; if we catch them early we can prevent further development of cancer. In our study, one case of HSIL with features suspicious

of invasion was found at the age of 85 years showing that in situ as well as invasive carcinoma can occur even after 70s made them recommend continue screening at older age.

The U.S. Preventive Services Task Force (USPTF) guidelines issued in 2012 advises screening for cervical cancer in women aged 21–65 years every 3 years and HPV testing every 5 years.[6] The American Cancer Society has given new screening guidelines for cervical cancer that all women should begin cervical cancer screening at age 21. Women between the ages of 21 and 29 should have a Pap test every 3 years. They should not be tested for HPV unless it is needed after an abnormal Pap test result. Women between the ages of 30 and 65 should have both a Pap test and an HPV test every 5 years. This is the preferred approach, but it is also OK to have a Pap test alone every 3 years. Women over age 65 who have had regular screenings with normal results should not be screened for cervical cancer. Women who have been diagnosed with cervical pre-cancer should continue to be screened. Women who have had their uterus and cervix removed in a hysterectomy and have no history of cervical cancer or pre-cancer should not be screened. Women who have had the HPV vaccine should still follow the screening recommendations for their age group. Women who are at high risk for cervical cancer may need to be screened more often. Women at high risk might include those with HIV infection, organ transplant, or exposure to the drug diethylstilbestrol.[11]

Strength of the Study

It is useful in diagnosing precancerous lesion and cancer of cervix in symptomatic patients with clinically suspicious cervical lesions as well as in patients having symptoms but normal cervix on clinical examination.

Limitations of the Study

There is a high interobserver and intraobserver variability noted in giving diagnosis of ASCUS, regardless the years of training or level of expertise. Perimenopausal changes and changes related to hormone replacement therapy mimic ASCUS, which lead to false positive diagnosis of ASCUS in older women. The main differential diagnosis of ASCUS is LSIL, marked reactive changes. There are also problematic zones in the interpretation of HSIL and LSIL and glandular epithelial abnormalities. In all these cases, histopathological examination from a representative area would be a gold standard method.

Conclusion

The Papanicolaou (Pap) test is a cost–effective and easy screening method for the detection of cervical cancer. Nowadays, many new technologies have been utilized in diagnosing various lesions of cervix, which are costly and cannot be easily implemented in our population due to the low socio-economic level of our patient population; conventional Pap smears still remain valuable for screening and diagnosing cervical carcinoma. As from the above finding, we conclude that screening by Pap smear should start at the age of 21 and above; an early detection can prevent further development of cancer and recommend continue screening at older age even after 70 years. The addition of HPV testing to cervical cancer screening strategies has now improved detection of cervical preneoplastic and neoplatic lesions.

Abbreviations used

RCC-reactive cellular changes

NILM-Negative for intraepithelial lesion or malignancy

ASCUS- Atypical squamous cells of undetermined significance

LSIL-Low grade squamous intraepithelial lesion

HSIL- High grade squamous intraepithelial lesion

SCC- Squamous cell carcinoma

AGUS- Atypical glandular cells of undetermined significance

ADC- Adenocarcinoma

DES- Diethylstilbestrol

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