



UTILITY OF PAP SMEAR STUDY IN THE DIAGNOSIS OF VARIOUS NEOPLASTIC AND NON NEOPLASTIC LESIONS OF CERVIX.

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Abstract

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BACKGROUND: Cervical cancer is one of the leading causes of death in Indian women. Pap smears are commonly used as cytological screening test for successful eradication of precancerous lesions, which has made it a routine procedure worldwide. Pap smears have been evaluated as a diagnostic test even in few non neoplastic conditions of cervix. **OBJECTIVES:** The study was conducted to explore various lesions of uterine cervix to find out target age group in which screening efforts can be concentrated for early detection as well as reduction of the incidence of cervical cancer and also to diagnose benign and inflammatory lesions to reduce the morbidity. **STUDY DESIGN:** Patients in the age group 18-65 years with various complaints were screened during August 2011 to August 2012. Total 221 patients were studied. Slides were fixed in 95% ethyl alcohol and stained with Pap and Hematoxylin & Eosin stains. Slides were reported according to The 2001 Bethesda System, by two pathologists. **RESULTS:** Out of 221 patients studied, 179 showed inflammatory smear, three cases of atrophic smear, 21 cases with epithelial abnormalities and 18 cases were inadequate. Benign and inflammatory lesions were common in 21-30years and epithelial abnormalities were common in 41-50 years of age group.

CONCLUSIONS: Pap smear is a simple, cheap, safe and practical diagnostic tool for early detection of cervical cancer in high risk group population and therefore should be established as routine screening procedure in asymptomatic women and as a diagnostic procedure in symptomatic women.

INTRODUCTION

According to National Cancer Registry Program of India, of all the Gynecological cancers cervical cancer is one of the leading cause of death in Indian women.^[1] The easy accessibility of the cervix and the propensity of the cancer cells to exfoliate from its surface have enabled us to study the process of malignant transformation in the cervix in very early stage.² Hence, Pap smears are commonly used as cytological screening test for successful eradication of precancerous lesions, which has made it a routine procedure worldwide.³

Pap smears have been evaluated as a diagnostic test even in few non neoplastic conditions of cervix.^[4] Currently Pap test has gained wide popularity not only as a diagnostic test in patients but also as an important routine screening test for cancer of cervix in asymptomatic women due to its simplicity and cost effectiveness.⁵

Cervical pap smear is a sensitive test for early screening of the cervical lesion and

most widely used system for describing pap smear result is The 2001 Bethesda System.⁶

MATERIALS & METHODS

The present study was conducted at Katuri Medical College, Guntur during the period August 2011 to August 2012, total 221 cases were screened.

The patients were in the age group between 18-65years with complaints (like vaginal discharge, back ache, lower abdominal pain, bleeding per vagina/bleeding on touch and with menstrual disorders) and routine screening purposes were included in our study. Menstrual history, obstetrical history and other relevant clinical history were recorded. Smears were taken by modified Ayers wooden spatula which was rotated 360° over cervix, sampling both ecto and endocervix. Slides were prepared, labeled, fixed in 95% ethanol immediately and

subsequently stained with Pap stain and Hematoxylin & Eosin stains.

After staining, slides were mounted with DPX (distrene dibutyl phthalate xylene), screened and reported by two pathologists according to The 2001 Bethesda System.

RESULTS AND DISCUSSION

Among the 221 cervical smears screened for, the predominant population was between 31-50yrs of age. Following were the observations.

The most common symptom in present study was vaginal discharge followed by menstrual irregularities (Table 1).

The common cytological diagnosis was inflammatory smear in 179 cases (80.99%) comprising papillary endocervicitis secondary to cervical erosion in 12 smears (05.42%), bacterial vaginosis in 10 smears (04.52%); 14 smears (06.33%) showed *Trichomonas cervicitis* and six smears (02.71%) *Candidal cervicitis*. No pathogen was identified in the remaining 137 smears. Three smears (01.36%) were atrophic smears (Figure 1).

In the epithelial abnormalities, there were three smears (01.36%) with atypical

glandular cells of undetermined significance (AGUS) and six cases (02.71 %) with atypical squamous cells of undetermined significance (ASCUS). High grade squamous intraepithelial lesion (HSIL) was diagnosed in seven (3.17%), followed by two smears (0.90%) of low grade squamous intraepithelial lesion (LSIL). Squamous cell carcinoma was diagnosed in three (01.36%) cervical smears (Figure 2). Of all the smears studied, 18 smears (08.15%) were inadequate.

Inflammatory lesions were more common in 21-30years age group where as epithelial abnormalities were common between 41-50 years (Table 2). Of the 21 cases with epithelial abnormalities, 19 cases (08.60%) were diagnosed in patients with para II and above (Table 3).

DISCUSSION

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 programme before they assume epidemic propagation. So, there is a need for an effective mass screening program aimed at

specific age group for detecting precancerous conditions before they progress to invasive cancers.⁷ The incidence of cervical cancer has decreased more than 50% in the past 30 years because of widespread screening with cervical cytology. Mortality from the disease has undergone a similar decrease.^{8,9}

According to WHO recommendations (1986), screening at 45 years of age is the most reliable approach, which could detect approximately 20% of total cervical cancers.¹⁰ The American Cancer control Program and the IARC have suggested similar or slightly modified screening programs.¹¹ But now, considering the efficacy of Pap smear cytology in preventing cervical cancer, it is advocated that it should be initiated in all women at the age of 21 years.¹²

Out of all the exfoliative cytology, pap smear has been regarded as the gold standard for cervical screening programs.¹³

The predominant population in the present study was between 21-40years (65.61%) with a chief complaint of vaginal discharge in 143 cases (64.71%); as in a study by Sherwani RK et al.¹⁴ Kenneth and Yao have emphasized the significance of vaginal

discharge and its association with neoplastic changes in the cervix.¹⁵

All the patients in the present study with post coital bleeding had HSIL and squamous cell carcinoma. These results were consistent with the known association of cervical neoplasia with post coital bleeding.¹⁶

The common cytological diagnosis was inflammatory smear, predominant population being 21-30years, as it is the reproductive age group and majority of the infections are sexually transmitted. The common epithelial abnormalities were HSIL followed by ASCUS. The predominant age group with epithelial abnormalities was between 41-50years.

Majority of the individuals diagnosed in the present study with premalignant and malignant lesions had an early onset of sexual activity in the late second decade, as has been reported by workers like Rotkin, who postulated that carcinoma of cervix is a disease transmitted from male to female during intercourse, with a higher probability of occurrence with early age at first coitus.²¹

The diagnosis of ASCUS is important as it progresses to LSIL, HSIL and SCC and AGUS progresses to adenocarcinoma.²²⁻²⁴ Cases of

LSIL were mostly found in the fourth decade; a finding similar to that reported by Richart et al.²⁵

This study shows that the incidence of high grade epithelial lesion increases with advancing age. In a study by Ranabhat SK et al, 80% of all abnormal epithelial lesions were found in the age group above 40 years^[17]. Another study by Misra et al has found that 51.5% of Squamous Intraepithelial Lesion cases and 75.3% of carcinoma cases were detected in women above 40 years of age.^[26]

In the present study the diagnosis of ASCUS, AGUS and LSIL were also given in cases of age group 31-40years, a decade earlier than other studies. Hence, the screening program should start at an earlier age as quoted by The American Cancer Society which recommends that all women should begin cervical cancer screening after 3 years of first sexual intercourse. It is also recommended to screen women who have crossed the age of 30 years for every 1-2 years and for women who have had three consecutive normal Pap smear results may be screened after 2-3 years.⁷

CONCLUSION

In countries like India with predominant rural population having low socio-economic status, marriage at an 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 and Pap smear is such a simple, cheap, safe and practical diagnostic tool for early detection of cervical cancer in high risk group population and therefore should be established as routine screening procedure in asymptomatic women and as a diagnostic procedure in symptomatic women.

It also has an important role in the diagnosis of inflammatory lesions including the identification of causative organism and atrophic changes. It is recommended that reporting should be done by The 2001 Bethesda System which improves the reproducibility and plays a key role to diagnose various intraepithelial lesions and invasive lesions at an early stage and manage them properly. All suspicious lesions on Pap smears should be followed by repeat Pap

Smear examination, colposcopy or cervical biopsy.

Health awareness programs particularly by Media and the Government with their

implementation in the form of screening camps at an early age as stated by American Cancer Society would be a great help to women particularly in countries like India.

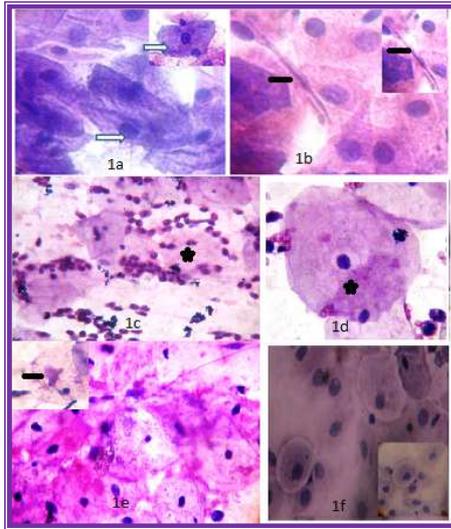


Figure 1: NON NEOPLASTIC LESIONS

Figure 1a: Bacterial vaginosis (Pap stain, 400x) showing clue cells (bacteria adherent to squamous cells) giving shag rug appearance.

Figure 1b: Candidal cervicitis (H&E,400x) showing pseudohyphae of candida

Figure 1c: Trichomonas cervicitis: Asterix showing BB shots , neutrophils adherent to squamous epithelial cells (Pap stain, 400x)

Figure 1d: Trichomonas cervicitis: Asterix showing intermediate squamous epithelial cell with perinuclear halo (Pap stain, 1000x)

Figure 1e: Trichomonas cervicitis: Showing many vegetative forms of Trichomonas vaginalis along with lactobacilli (H&E,400x)

Figure 1f: Atrophic smear: Showing many parabasal cells (Pap stain, 400x)

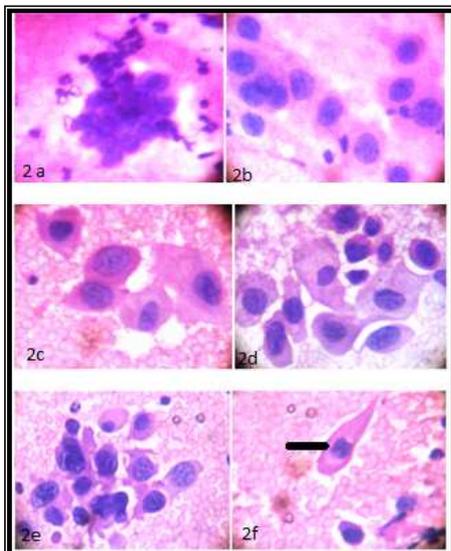


Figure 2: EPITHELIAL ABNORMALITIES

Figure 2a. Atypical glandular cells of undetermined significance (AGUS)(H&E 400x)

Figure 2b. Atypical Squamous cells of undetermined significance (ASCUS) (H&E 400x) with nuclear enlargement, smooth nuclear outlines and even chromatin distribution

Figure 2c. Low grade squamous intraepithelial lesion (LSIL) (H&E 400x) showing non koilocytes with high N/C ratio and normochromic chromatin pattern.

Figure 2d. High grade Squamous intraepithelial lesion (HSIL) (H&E 400x) showing round to oval cells with cyanophilic cytoplasm, high N/C ratio but with irregularly distributed chromatin and moderately hyperchromatic nuclei

Figure 2e. Squamous cell carcinoma (SCC) (H&E 400x) showing neoplastic cells with high N/C ratio, irregularly clumped coarse nuclear chromatin, hyperchromasia, cerebriform nuclei with indistinct nuclear membranes in few

Figure 2f. Tadpole cells in SCC (indicated by arrow) (H&E 400x)

Table 1

Frequency distribution of patients according to symptoms

Symptoms	Number of patients	Percentage
Vaginal discharge	143	64.71%
Post coital bleeding	14	06.33%
Menstrual abnormalities	22	09.96%
Back ache	07	03.17%
Lower abdominal pain	06	02.71%
Infertility	04	01.81%
Post menopausal bleeding	05	02.26%
Other complaints	20	09.05%
Total	221	100%

Table 2

Relationship of age with various lesions on cervical pap smear

Cytological diagnosis on pap smear	18-20 years	21-30 years	31-40 years	41-50 years	51-60 years	61-65 years	Percentage
Inflammatory changes							80.99%
Acute/Chronic Inflammation	02	52	40	37	06	-	61.99%
Papillary endocervicitis with cervical erosion	-	04	07	01	-	-	05.43%
Bacterial vaginosis	-	08	02	-	-	-	04.52%
Trichomonas cervicitis	01	07	06	-	-	-	06.34%
Candidal cervicitis	-	-	01	04	01	-	02.71%
Atrophic smear	-	-	-	-	02	01	01.36%
Epithelial abnormalities							09.50%
Atypical glandular cells of undetermined	-	-	01	02	-	-	01.36%

significance (AGUS)							
Atypical squamous cells of undetermined significance (ASCUS)	-	-	01	05	-	-	02.71%
Low grade squamous intraepithelial lesion(LSIL)	-	-	02	-	-	-	0.90%
High grade squamous intraepithelial lesion(HSIL)	-	-	-	04	03	-	03.17%
Squamous cell carcinoma(SCC)	-	-	-	01	02	-	01.36%
Unsatisfactory smear	-	07	07	04	-	-	08.15%
Total	03	78	67	58	14	01	221(100%)

Table 3

Distribution of epithelial abnormalities according to Parity

Parity	Number of patients	ASCUS No.of patients	AGUS No.of patients	LSIL No.of patients	HSIL No.of patients	SCC No.of patients	Total No.of patients (%)
Nulliparous	06	-	-	-	-	-	00.00%
Para I	82	01	-	01			02 (0.90%)
Para II	117	01	03	01	03	01	09(4.08%)
Para III & above	16	04	-		04	02	10(4.52%)
Total	221	06	03	02	07	03	21 (09.50%)

Table 4

Comparison of various cervical lesions on pap smear with other study series

Study series	Inflammatory, benign and other unsatisfactory smears	Premalignant and malignant lesions
Mandakini et al ^[7] (n=995)	940 (94.5%)	55 (05.5%)
Ranabhat SK et al ^[17] (n=880)	865 (98.3%)	15(01.7%)
Chalermchockcharoenkit et al ^[18] (n =821)	694 (84.5%)	127 (15.5%)
Bhojani et al ^[19] (n=400)	363 (90.75%)	37 (9.25%)
Sania Tanveer Kathak et al ^[20] (n=300)	288 (96.0%)	12 (04.0%)
Sherwani RK et al ^[14] (n=160)	136(85.0%)	24(15.0%)
Present study (n=221)	200(90.5%)	21(09.5%)

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