 DOI: 10.5958/2394-6792.2016.00126.5

Study of cervical cytology in Papanicolaou (Pap) smears in a tertiary care hospital

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Abstract

Background: Cancer of the cervix is the third most common cancer in women. The mainstay of cervical cancer screening has been the Papanicolaou test.

Aim: To study the frequency of premalignant and malignant lesions of cervix and to study the clinicopathological aspects of cervical lesions.

Materials and Methods: This is a hospital based study of conventional cervical smears received between January 2014 to December 2015. For evaluating the Pap smears, the Bethesda system (2014) for reporting cervical cytology was used.

Results: In the present study, 1418 cases were analysed during the mentioned period. Age of women ranged from 16 to 92 years. Commonest complaint was irregular bleeding per vagina and leucorrhea. 1164 smears (82.08%) belonged to NILM category, 132 smears (9.3%) were unsatisfactory for evaluation. ASCUS accounted for 4.87%, ASC-H 0.56%, LSIL 1.62%, HSIL 0.64%, AGC 0.64% and SCC 0.28% of cases.

Conclusion: It was found that premalignant and malignant lesions of cervix is not common in our set up.

Keywords: Cervical cancer, Cervical cytology, Papanicolaou smear

Introduction

Cancer of cervix is the third most common cancer in women[1]. It is the second most common cause of death from cancer in women[2]. It is estimated that in India, 1,26,000 new cases occur each year[3]. The incidence of cervical cancer has decreased by more than 50% in the past 30+ years, due to the increasing use of cervical cancer screening with cervical cytology[4]. The mainstay of cervical cancer screening has been the Papanicolaou test, also known as the Pap test or the Pap smear. It was developed by Dr. George Papanicolaou in the 1940s who discovered that precancerous and cancerous cells could be identified in cytologic samples from vaginal aspirates[5]. Unlike most other malignancies, cancer of cervix is readily preventable when effective programmes are conducted to detect and treat its precursor lesions[3]. The screening coverage in India is appalling inspite of the existence of national guidelines. It is mainly attributed to inequality between infrastructure, resources and outsized population[6].

The Bethesda System (TBS) for reporting the results of cervical cytology was developed as a uniform system of terminology that could provide clear guidance for clinical management[7].

Aim

The present study was undertaken to determine the frequency of premalignant and malignant lesions of cervix and to study the clinicopathological aspects of various cervical lesions.

Materials and Methods

This is a cross sectional study of conventional cervical smears received, processed and reported in the central laboratory of a tertiary care hospital in Mysuru district of Karnataka state, India over a period of two years from January 2014 to December 2015. Institutional research cell and Ethics Committee approval was taken for the study. All women who underwent Papanicolaou (Pap) smear testing during this period were included in the study. Women who presented to gynaecology out-patient department with complaints of vaginal discharge, post coital bleeding, intermenstrual bleeding and pain in lower abdomen were subjected to Pap test. Relevant clinical details were noted. Pap smears were obtained from squamocolumnar junction with the help of Ayre's spatula. The material obtained was quickly smeared on a clean glass slide and the smear was immediately fixed in 95% ethyl alcohol. In the central laboratory, the slides were stained with Papanicolaou stain and examined under light microscope. The cytological interpretation of the smears was made according to The Bethesda System 2014 (TBS).

Results

A total of 1418 cases were analysed during the study period. Age of the women ranged from 16-92 years. Most of the women were in the age group of 31-40 years (Table 1). Irregular bleeding per vagina, leucorrhea, backache, abdominal pain, burning micturition and vulval pruritus were the common presenting features (Table 2). Clinical examination and ultrasound examination findings are shown in Table 3.

Table 1: Age wise distribution of cases

Age-group (in years)	Number of cases	Percentage %
11-20	13	0.91%
21-30	412	29%
31-40	464	33%
41-50	339	24%
51-60	98	07%
61-70	62	04%
71-80	21	1.5%
81- 90	06	0.4%
91-100	03	0.2%
Total	1418	100%

Table 2: Age wise distribution of clinical presentation

Age in years	Leucorr-hoea	Backac-he	AP	Bleedi-ng p/v	Burning micturiti-on	Vulval prurit-us	Mass p/v	Amenorr-hoea	Dyspareu-nia	PMB	PCB	Asy mpto matic
11-20	04	_	09	_	_	_	_	_	_	_	_	-
21-30	168	_	06	05	08	07	_	06	01	_	_	211
31-40	76	13	01	130	05	02	07	05	_	_	01	224
41-50	21	13	130	128	02	01	03	01	01	01	_	38
51-60	02	02	02	04	03	02	_	_	_	01	_	82
61-70	01	_	01	01	02	04	_	_	_	_	_	53
71-80	_	_	_	08	_	_	_	_	_	_	_	13
81-90	_	_	03	_	_	_	_	_	_	_	_	03
91-100	_	_	_	02	_	01	_	_	_	_	_	-
Total	272	28	152	278	20	17	10	12	02	02	01	624
%	19.18%	1.97%	10.72 %	19.61%	1.41%	1.20%	0.71 %	0.85%	0.14%	0.14 %	0.07 %	44%

AP-Abdominal pain, p/v-per vagina, PMB-Post menopausal bleeding, PCB-Post coital bleeding.

Table 3: Per speculum and ultrasound examination findings

Appearance of cervix	Number of cases with percentage
No gross pathology	839 (59.01%)
Hypertrophied cervix	132 (9.31%)
Cervical erosion	263 (18.5%)
Prolapse/ Mass per vagina	151 (10.6%)
Vaginal ulcer	02 (0.14%)
Nodule in vulval vault	02 (0.14%)
Fibroid uterus	23 (1.62%)
Endometrial carcinoma	01 (0.07%)
Ovarian cyst/ Tumor	05 (0.35%)
Total	1418

Table 4: Cervicovaginal cytology interpretation/results by the Bethesda System(2014)

Interpretation /Results	Number of cases and percentage
Unsatisfactory for evaluation	132 (9.3%)
Negative for intraepithelial lesion or malignancy	1164(82.08%)
ASC-US	69 (4.87%)
ASC-H	08 (0.56%)
LSIL	23 (1.62%)
HSIL	09 (0.64%)
Squamous cell carcinoma	04 (0.28%)
AGC	09 (0.64%)
Adenocarcinoma	00 (00%)
Total	1418

ASC-US: Atypical Squamous Cells of Undetermined Significance.
ASC-H: Atypical Squamous Cells cannot exclude High grade squamous intraepithelial lesion.
LSIL: Low-grade Squamous Intraepithelial Lesion.
HSIL: High-grade Squamous Intraepithelial Lesion.
AGC: Atypical Glandular Cells.

132 smears (9.3%) were found to be unsatisfactory for evaluation and 1164 were Negative for Intraepithelial Lesion/ Malignancy (NILM). The remaining smears belonged to various categories as shown in Table 4. 1164 cases reported as NILM (Fig. 1) had cytological features of various conditions as shown in Table 5.

Table 5: Distribution of NILM cases

Interpretation/ Results	Number of cases and percentage
Non-Specific Inflammatory Smears	1133 (97%)
Trichomonas Vaginalis	04 (0.34%)
Candida albicans	04 (0.34%)
Bacterial Vaginosis	05 (0.43%)
Tricomoniasis and Bacterial Vaginosis	01 (0.09%)
Atrophic smears	17 (1.46%)
Total	1164

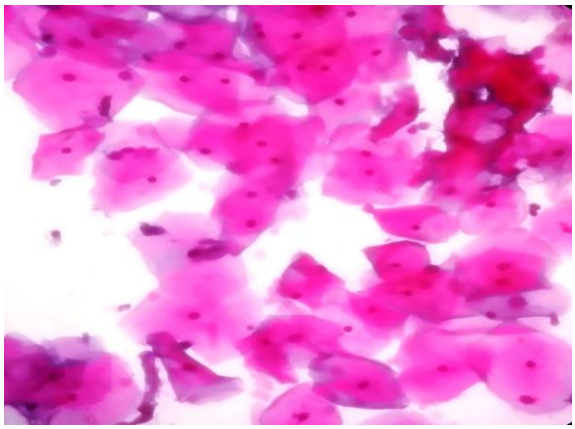

Fig. 1: NILM (x40) Smear showing predominantly superficial squamous epithelial cells

Fig. 2: NILM with non-specific inflammation (x40) Smear showing superficial squamous epithelial cells and numerous acute inflammatory cells

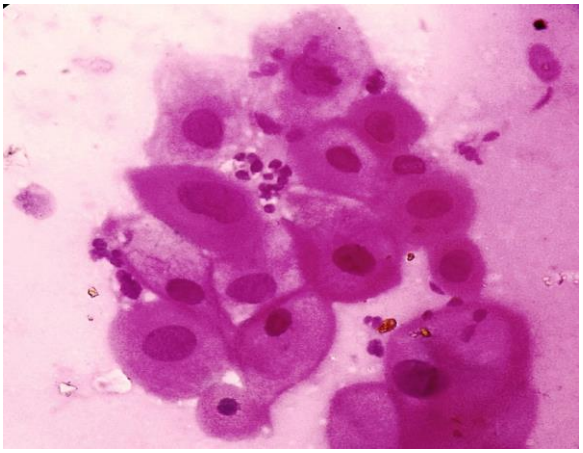

Fig. 3: LSIL(x100) Smear showing nuclear enlargement of superficial squamous epithelial cells

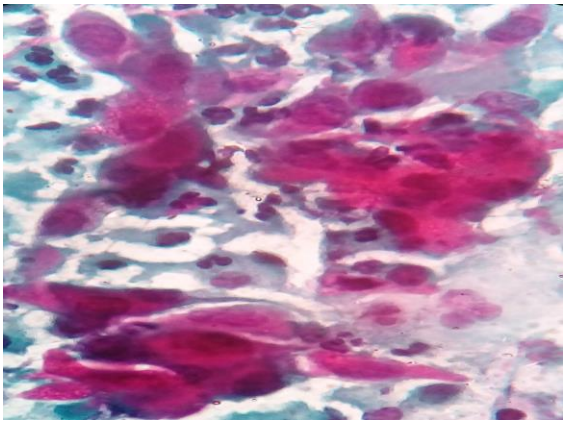

Fig. 4: Squamous cell carcinoma(x100). Smear showing nuclear pleomorphism and tadpole cells

Discussion

Prevention of cervical cancer can be primary or secondary[8]. Primary prevention modalities include changes in sexual behavior and Human Papilloma Virus (HPV) vaccination. Secondary prevention of cervical cancer includes visual inspection of cervix (VIA), cervicoscopy, HPV testing and cytology. Pap smear test is a secondary preventive method aimed at identification of premalignant and malignant lesions, which may need follow-up and/ or treatment[9].

Pap smear has excellent specificity (95%) while sensitivity is moderate (44-74%)[10]. Newer techniques like liquid based cytology (LBC) reduce the number of inadequate smears, but it is expensive[10].

Out of 1418 cases subjected to Pap test, 335 were in the fourth decade of life similar to the studies of Vaghela et al[11], Nikhumb et al[12] and Bhojani et al[13]. There were 3 cases aged more than 90 years who had NILM.

Irregular bleeding per vagina and menorrhagia were the predominant symptoms followed by leucorrhea and lower abdominal pain. Menorrhagia was seen mainly in cases in the fourth decade of life. Many had leucorrhea with pain abdomen. Leucorrhea was the

predominant symptom in the studies of Bhojani et al (46.5%)[13], Rajput et al (73.5%)[6] and Nikhumb et al (69.3%)[12].

In majority of cases, no gross pathology was seen on per speculum examination similar to the finding in the studies of Nikhumb et al[12]. In the study of Rajput et al[6], cervical erosion was noted in majority of cases. In the present study, cervical erosion was seen in cases in the third decade of life and uterine prolapse was seen in cases in 6th decade of life.

Conventional Pap test was found to have false negative rate of about 14-33% approximately two thirds of which is due to limitation of sampling and slide preparation[5]. These limitations may lead to inaccuracy and equivocal diagnosis.132 smears were found to be unsatisfactory in the present study, most of them were of cases in 6th decade. This was due to non-accessibility of squamo-columnar junction in cases of prolapse of uterus. Unsatisfactory smears were 4.8% (Vaghela e al)[11], 5.71% (Bamanikar et al)[1] and 4.5% (Rajput et al)[6] in other studies.

Pap smear is an integral part of the comprehensive health care of women[12]. Besides being a tool of cancer diagnosis, it is used for the identification of infections such as trichomonas, herpes and HPV as well as for the classification of the hormonal pattern. Smears with inflammatory changes were seen mainly in women in the reproductive age group. Non-specific inflammatory smears formed the majority of cases in the studies of Nikhumb et al[12], Bhojani et al[13] and Vaghela et al[11]. NILM included non-specific inflammation (Fig. 2), atrophy, trichomoniasis, candidal infection, bacterial vaginosis and herpes simplex viral infection.

In the present study, majority of LSIL cases (Fig. 3) were detected in the fifth and sixth decades. HSIL was in age group of fourth to eighth decades. Squamous cell carcinoma (Fig. 4) was seen in fifth decade (two cases) and seventh decade (two cases). Majority of the cases with an abnormal Pap smear (LSIL or HSIL) belonged to the fourth decade in the study of Jana et al[14] and Nair et al[15]. LSIL is seen in earlier age group than HSIL and invasive carcinoma in studies of Bal et al[3] and Elthakeem et al[16]. ASCUS constituted 4.87% of cases, majority of them in the fourth and fifth decades. One case each of LSIL, ASC-H and ASCUS were seen in women in the 9th decade of life. When abnormal cells are seen in a Pap smear, colposcopy is often indicated which may be followed by colposcopic biopsies. Diagnosis and treatment of cervical cancer precursors prevents subsequent development of cervical cancer. Detection of SCC is probably due to failure of regular screening programmes.

The limitation of this study is that it is a hospital based study which may not be a true reflection of the local population.

There is an urgent need for community sensitization on how to prevent cervical cancer by providing free cervical cancer screening and HPV vaccine for adolescent girls to lower the incidence of cervical cancer in our country. Health care professionals should educate people about the benefits of Pap test. Pap smear screening has the following limitations in India[12]: (1)Women do not participate in regular screening programmes due to ignorance and lack of education about prevention by screening, cultural taboo about sexually transmitted diseases, lack of support from family, and poor socioeconomic status. (2) Clinicians may fail to obtain an adequate smear, do proper follow up and treatment, and may not counsel women that prevention is better than cure. (3) Pathologist may be incorrect in interpretation of smears and many areas lack a cytotechnologist for staining and smear interpretation. (4) Health care systems are constrained by lack of infrastructure and finances to conduct screening programmes[12].

Conclusions

In the present study it was found that premalignant and malignant lesions of cervix is not common in our set up. Pap smear is a simple, safe and effective test to detect cervical lesions at an early stage and helps the clinician in efficient management of these cases. It also has a greater role in diagnosis of inflammatory lesions including the identification of causative organism and atrophic changes.

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