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Diagnostic utility of 2014 Bethesda system of reporting cervical cytopathology: A 1 year retrospective study

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Abstract
Background: Pap smear (Conventional smear) is the most widely used cervical cancer screening test in the world. Negative intraepithelial lesion for malignancy, squamous intraepithelial lesion and cervical cancer remain important health problems for women worldwide. In developing countries like India, there is a great need for mass screening program for cervical lesion.
Aims and Objectives: To assess the clinician utility of The 2014 Bethesda System Reporting of cervical epithelial abnormalities.
Material and Methods: All the cervical cytology Pap smears received in Department of Pathology Vishwabharti Medical College, Kurnool, A.P were retrieved and reviewed in the duration of 1 years from 2017 - 2018.
Results: A total number of 110 cases of Pap smears were retrieved during period of study, out of which 83.6% were satisfactory for evaluation; 17.3% were within normal limit and 64.5% were NILM. A few (8.2%) of the cases were reported as squamous intraepithelial lesion; 7.3% ASCUS.
Conclusion: Pap smear is a proven tested tool for making an early diagnosis and treating cervical cancer in early stage. Thus, Pap smear is simple, less expensive diagnostics tool suitable for implementation in India. The Bethesda system used for cervical cytology is not only a uniform and standard method but also gives descriptive diagnosis that helps the gynaecologist in individualized patient management.

Keywords: Atypical squamous cells, cervical cytology, Bethesda system, conventional Pap smear

Introduction

The examination of exfoliated cervical and vaginal cells for the detection of premalignant and malignant diseases has been performed for more than 50 years [1]. This screening method is commonly referred to as the Pap smear named for George N. Papanicolaou, who in 1923 described malignant cells in vaginal fluid aspirated from the fornix and pursued the development of screening procedure. The sampling procedure is designed to collect an adequate number of representative well-preserved epithelial cells including cells from the transformation zone [2]. The results of the Papanicolaou smear are communicated to the clinician utilizing a format and terminology formulated by the National Cancer Institute workshop (Developed in 1988 and revised in 1991) and referred to as the Bethesda System. Each cluster composed of a minimum of at least five appropriate cells is considered an adequate endocervical/transformation zone of component. A minimum of two clusters of well-preserved endocervical and a statement of a key component in the Bethesda System classification of cervical smears [3]. Again revised in 2001 and in 2014. The Worldwide HPV prevalence in cervical carcinoma is 99.7% [4]. In developed countries such as USA, 85% of women had at least one Pap test through their lifetime, but this rate is only 5% in the developing countries. The five–year survival is 50% in developing countries, where it is 66% in developed ones [5].

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Bethesda Terminology Changes

Table 1: The 2014 bethesda system for reporting cervical cytology [11]

Specimen Type: Indicate conventional smear (Pap smear) vs. liquid-based preparation vs. other
Specimen Adequacy   • Satisfactory for evaluation (describe presence or absence of endocervical/transformation zone component and any other quality indicators, e.g., partially obscuring blood, infl ammation, etc.)   • Unsatisfactory for evaluation. (specify reason) – Specimen rejected/not processed (specify reason) – Specimen processed and examined, but unsatisfactory for evaluation of epithelial abnormality because of (specify reason)
General Categorization (Optional)   • Negative for Intraepithelial Lesion or Malignancy   • Other: See Interpretation/Result (e.g., endometrial cells in a woman ≥45 years of age)   • Epithelial Cell Abnormality: See Interpretation/Result (specify 'squamous' or 'glandular' as appropriate)
Interpretation/result negative for intraepithelial lesion or malignancy   (When there is no cellular evidence of neoplasia, state this in the General Categorization above and/or in the Interpretation/Result section of the report -- whether or not there are organisms or other non-neoplastic fi ndings)
Non-Neoplastic Findings (optional to report optional to report; list not inclusive)   • Non-neoplastic cellular variations – Squamous metaplasia – Keratotic changes – Tubal metaplasia – Atrophy – Pregnancy-associated changes   • Reactive cellular changes associated with: – Infl ammation (includes typical repair)   • Lymphocytic (follicular) cervicitis – Radiation – Intrauterine contraceptive device (IUD)   • Glandular cells status post hysterectomy
Organisms   • Trichomonas vaginalis   • Fungal organisms morphologically consistent with Candida spp.   • Shift in fl ora suggestive of bacterial vaginosis   • Bacteria morphologically consistent with Actinomyces spp.   • Cellular changes consistent with herpes simplex virus   • Cellular changes consistent with cytomegalovirus
Others   • Endometrial cells (in a woman ≥45 years of age) (Specify if "negative for squamous intraepithelial lesion")
Epithelial Cell Abnormalities Squamous Cell   • Atypical squamous cells – of undetermined signifi cance (ASC-US) – cannot exclude HSIL (ASC-H)   • Low-grade squamous intraepithelial lesion (LSIL) (encompassing: HPV/mild dysplasia/CIN 1)   • High-grade squamous intraepithelial lesion (HSIL) (encompassing: moderate and severe dysplasia, CIS; CIN 2 and CIN 3) – with features suspicious for invasion (if invasion is suspected)   • Squamous cell carcinoma
Glandular Cell   • Atypical – endocervical cells (NOS or specify in comments) – endometrial cells (NOS or specify in comments) – glandular cells (NOS or specify in comments)   • Atypical – endocervical cells, favor neoplastic – glandular cells, favor neoplastic   • Endocervical adenocarcinoma in situ   • Adenocarcinoma – endocervical – endometrial – extrauterine – not otherwise specifi ed (NOS)
Other Malignant Neoplasms: (specify)

Material and methods

This is a retrospective observational study carried out in the Department of Pathology, Vishwabharti Medical College, Kurnool, A.P, India were retrieved and reviewed in the duration of 1 years from 2017 - 2018. A total number of 110 conventional Pap smears were collected from women attending the Gynae OPD in the Department of Obstetrics and Gynaecology.

Slides were smeared, immediately fixed with 95% alcohol along with completely filled requisition form were sent to cytology section. All smears were stained by Papanicolaou stain and observed under the microscope 10x, 40x and 100x objectives. Reported with application of the 2014 Bethesda System for evaluation of cervical/vaginal lesions.

Aims and objectives

To assess the clinician utility of The Bethesda System Reporting of cervical and vaginal epithelial abnormalities.

Inclusion Criteria

Women of age between 21-70 years with presenting complaints, e.g. white discharge, pain in abdomen, burning micturition, post coital bleeding, intermenstrual bleeding, well preserved smear with complete clinical details and willing to Pap screening.

Exclusion Criteria: Below 20 years and above 70 years, hystrectomy patient (Vault), diagnosed case of squamous cell carcinoma with or without therapy, infertility cases (Hormonal evaluation), during menstruation, pregnancy, post-partum, air dried smear, incomplete clinical details.

Results

Maximum number of patients (38.1 %) was in the age group of 31 – 40 years (fourth decade). As per as the patients presenting complain was concerned, vaginal discharge was commonest (55.1%) followed by lower abdominal pain (37.9%) and post menopausal bleeding (7.3%). In this study total number of 110 Pap smear were screened during the period of 1 year; 92 (83.6%) smears were satisfactory for evaluation.

Table 2: Cytological findings broadly classified into unsatisfactory smears, normal and abnormal smears

Cytological findings		Number of cases	Percentages
Unsatisfactory	Inadequate sample	11	10
	Obscured with blood or inflammatory cells	07	6.4
Normal smears		19	17.3
Abnormal smears		73	66.3
Total		110	100

Table 3: Distribution of cases according to Categorization of Lesion

Categorization		Number of cases (n =110)	Percentages
Unsatisfactory - 18	Inadequate sample	11	10
	Obscured with blood or inflammatory cells	07	6.4
NILM - 71			64.5
	Normal	19	17.3
Inflammatory -52			47.3
	Nonspecific	34	30.9
	Candida	06	5.5
	Trichomonas	12	10.9
Epithelial cell abnormality - 21		21	19.1
ASCUS – 08		08	7.3
SIL – 09			8.2
	LSIL	06	5.5
	HSIL	03	2.3
Malignancy - 04			3.6
	SCC	03	2.7
	Adenocarcinoma	01	0.9

Pap smears (benign cellular changes of inflammation as well as Epithelial Cell Abnormalities (ECA), with 19(17.3%) normal cases and 18 (16.4%) unsatisfactory or inadequate samples. Of the 73 abnormal cases, only 21 cases (19.1%) were reported to have epithelial cell abnormality having 08 cases with ASC-US, 06 cases of LSIL, 03 of HSIL, 3 cases of invasive squamous cell carcinoma and 1 case of adenocarcinoma cervix.

The age range of patients with epithelial cell abnormality was 20 to 75 years and the mean age was 44.1 years.

Out of the 71 smears reported as Negative for Intraepithelial Lesion or Malignancy (NILM), 19 (17.3%) showed normal cytological findings and 52 (47.3%) were inflammatory. Out of 47 inflammatory smears, 34 (30.9%) showed non-specific inflammation, 06 (5.5 %) had features of Candida infection, and 12 cases (10.9%) had evidence of trichomonas infection.

Discussion

Cancer of the cervix is a preventable disorder as the different screening, diagnostic and therapeutic procedures are effective. One of the essential responsibilities of the gynaecologist is to detect neoplasm of the genital tract at the earliest. Since the introduction of cytology into clinical practice by Papanicolaou and Traut in 1944, it has become possible to detect cervical cancer in its preinvasive stages, thus reducing the morbidity and mortality from this disease.

In present study out of 110 smears 83.6% were satisfactory for evaluation, similar findings reported by Shrivastava M *et al*. [6] in 2011 (91.02%). Vijay Kumar Bodal *et al*. [7] in 2014 96% and Verma I *et al*. [8] in 2014 reported 97.6% of satisfactory smears. In present study age ranged from 20 to 75 years, similar study reported by Jain V *et al*. [9] in 2010 20–80 years, but other authors reported range of various age group. In present study non–specific inflammatory lesions shows highest percentage 65.4% in comparision of other authors Kishor H, Suryawanshi *et al*. [10] in 2013, Shrivastava M *et al*. [6] in 2011 and Vijay Kumar Bodal *et al*.

[7] in 2014. In present study, candidiasis was reported in 5.5% of cases similar study reported by Shrivastava M *et al*. [6] in 2014. In present study, 5.5% of LSIL, 2.3% of HSIL, 2.7% of SCC, 7.3% of ASCUS. These findings are correlated with other authors. The clinical follow–up of ASCUS is variable. The options being repeat cytology, immediate colposcopy or HPV DNA testing. Most of our patients have colposcopically directed biopsy as the next procedure.

In the present study both cytobrush and plastic spatula were used to prepare the Pap smears by the first author and all the smears were reported by a single cytopathologist reducing the bias of technique and observer variation. ASCUS rate of our study was 7.3% which depicts that the standardized diagnostic criteria for cervical cytological reporting were used by cytopathologist, so that the rate of atypical squamous cells (ASC) was between 3 to 5% of cytological diagnosis for accurate reporting as reported by Kurman *et al*. [13].

Conclusion

Pap smear has been regarded as the gold standard for cervical cancer screening programs. Papanicolaou (Pap) smear is a safe, non-invasive and effective method for detection of pre-cancerous, cancerous and non-cancerous changes in the cervix. In developing countries like India, there is a great need for mass screening program. The Bethesda system used for cervical cytology is not only a uniform and standard method but also gives descriptive diagnosis that helps the gynaecologist in individualized patient management. Communication between gynaecologist and cytopathologist is required for best results of the cervical cytology reporting.

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