



Original Research Article

Application of Bethesda system to study cytological pattern of cervical papaincolaou smear in 500 cases at a tertiary care centre

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ABSTRACT

Introduction: Cancer cervix is a leading cause of mortality and morbidity in developing countries like India. In developing countries, cervical cancer is the most common cancer cause of death among women. Developing countries accounted for about 80% of the global burden.

Aim: To study the cervical cytology in 500 cervical Pap smears and classify the smears according to Bethesda 2014. To highlight the importance of Pap smear study in differentiating premalignant and malignant lesions.

Materials and Methods: In this retrospective study, a total of 500 Papaincolaou smears with age group of 20 to 75 years coming to the cytology section of Pathology department, Mysore Medical College and Research institute, Mysore, during the time period of 1st April 2018 to 31st August 2018.

Results: In this study, out of 500 cases maximum cases were of negative for intraepithelial lesion or malignancy 416 cases (83.2%) followed by low-grade squamous intraepithelial lesion with 6 cases (1.2%), followed by high-grade squamous intraepithelial lesion with 5 cases (1%) then atypical glandular cells of undetermined significance 3 cases (0.6%) and minimum number of carcinoma cases 02 (0.4% - including 0.4% of squamous cell carcinoma and 0% of adenocarcinoma).

Conclusion: Cervical cytology by Pap smear is an important tool for early detection of premalignant and malignant lesions of cervix. Regular Pap smear screening should be conducted in vulnerable age group.

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1. Introduction

In India cervical carcinoma is one of the most common cancers among women and has also been the common cause of death. The Papaincolaou (Pap) smear was considered standard test for screening among reproductive women to detect benign, precursor and malignant conditions of cervix since 1941.¹ These cervical lesions are grouped under the Bethesda system 2014 in order to standardize the treatment protocol for clinicians and hence appropriate management of the cases.² After implementation of routine protocol of screening for cervical cancer, the cancer incidence and mortality have been significantly reduced.³

Some of the cancer control programmes and screening tests have checked the cervical cancer incidence and its

related mortality. The incidence and death rate due to cervical cancer is reduced upto 80% in some of the developing countries. Pap smear cytology is useful to detect and evaluate the degree of cellular alterations seen among cervical abnormalities. As Pap smear screening test is simple, rapid and cost effective, it is an ideal tool for mass screening programmes and better reliable results are obtained compared to other tests.⁴

The present study was undertaken to study the cervical cytology in 500 cervical Pap smears and classify the smears according to Bethesda 2014. To highlight the importance of Pap smear study in differentiating premalignant and malignant lesions.

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2. Materials and Methods

2.1. Study design

A retrospective study was conducted in the department of Pathology at Mysore Medical College And Research Institute.

2.2. Source of data

In this study, women of age group 20 to 75 years were included and the study was conducted for a period of 6 months.

2.3. Specimen collection and examination

Pap smears were obtained around mid-cycle to ensure reliability of the test. Smears were taken from the transformation zone with use of Ayre's spatula rapidly and stroked gently and evenly spread on a glass slide. These smears were fixed in isopropyl alcohol for 30 minutes and stained by rapid Pap method. A total of 500 Pap smears were sampled and studied. These smears were classified according to Bethesda system 2014.

The following is the 2014 Bethesda system for reporting cervical cytology :

1. Specimen Type
2. Specimen Adequacy
3. Interpretation/Result
4. Negative For Intraepithelial Lesion or Malignancy
5. Other

Endometrial cells (in a women >45 years of age) (Specify if "negative for squamous intraepithelial lesion")

2.4. Epithelial cell abnormalities

2.4.1. Squamous Cell

1. Atypical squamous cells
 - a. of undetermined significance (ASC-US)
 - b. Cannot exclude HSIL (ASC-H)
2. Low-grade squamous intraepithelial lesion (LSIL) (encompassing: HPV/mild dysplasia/CIN1)
 - a. High-grade squamous intraepithelial lesion (HSIL) (encompassing: moderate and severe dysplasia, CIS; CIN 2 and 3) -with features suspicious for invasion (if invasion is suspected)
 - b. Squamous cell carcinoma

2.4.2. Glandular cell

- a. Atypical
 1. Endocervical cells (NOS or specify in comments)
 2. Endometrial cells (NOS or specify in comments)
 3. Glandular cells NOS or specify in comments)
- b. Atypical
 1. Endocervical cells, favour neoplastic
 2. Endometrial cells, favour neoplastic

- a. Endocervical adenocarcinoma in situ
- b. Adenocarcinoma
 1. Endocervical
 2. Endometrial
 3. Extrauterine
 4. Not otherwise specified (NOS)
 5. Other malignant neoplasms: (specify)

3. Results

Out of total 500 cases in the age group of 20 to 75 years, maximum numbers of cases were in age group 41-50 years, second highest frequency was in the age group between 31-40 years and least number of cases were seen among women >60 years (Table 1).

In our study 448 (89.6%) smears were satisfactory according to the Bethesda system. The epithelial cell abnormalities constituted 12.4% of all cases and rest of 386 cases (77.6%) fell in the category of NILM. Maximum no of cases (n=386) 77.2 % are in the category of NILM. Cancer incidence found to be 0.4%. Precursor lesion found to be 7%. Rate of epithelial cell abnormality is 12.4% (Table 2).

Highest frequency of cervical abnormalities was seen in 41-50 year age-group, particularly ASCUS and LSIL cases were more in this age group. HSIL cases were high in the age group above 50 years. Squamous cell carcinoma was found to be in the age group between 41-60 years. AGCUS was found equally in 4th to 6th decades (Table 3).

Incidence of NILM, SIL and invasive carcinoma are comparable to other studies. In various studies SIL rate varies from 3%-13% and carcinoma incidence from 0.1% -6%. In our study SIL rate is 7% and carcinoma incidence 0.4% comparable to Kulkarni's study (Table 4).

Representative Photographs of smears classified as Low grade Squamous Intraepithelial Lesion (LSIL) and High grade Squamous Intraepithelial Lesion (H SIL) are shown in Figures 1 and 2 respectively.

4. Discussion

Cancer of the cervix has been the most important cancer among women, cytology has been mainstay for screening in the past two decades and screening has led to substantial reduction in cancer incidence.¹⁷ These cervical lesions progress with time to reach invasive stage and our remarkable knowledge about the natural course of cervical cancer has led to invention of new tools to prevent the same.¹⁸

Since these cervical lesions have prolonged latent phase, screening tests are useful to identify and prevent precursor lesion progression to malignancy with the use of low cost procedures.¹⁹

The Bethesda system has been widely accepted and used. The reason for wide usage is that because TBS has specified the appropriate criteria for specimen adequacy

Table 1: Age wise distribution of total number of patients

Age group(years)	No. of cases	Percentage
21-30	60	12
31-40	170	34
41-50	178	35.6
51-60	65	13
>60	27	5.4

Table 2: Findings of Pap smear cytology

Diagnosis	No. of cases	Percentage
Unsatisfactory for evaluation	52	10.4
Negative for intra epithelial lesion or malignancy (NILM)	386	77.2
ASCUS	22	4.4
LSIL	30	6
HSIL	5	1
Squamous cell carcinoma (SCC)	2	0.4
AGCUS	3	0.6
Adenocarcinoma	0	0

Table 3: Age wise abnormal findings

Age group	No. of cases	ASCUS	LSIL	HSIL	SCC	AGCUS	Adenocarcinoma	Total abnormal findings	%
21-30	60	2	2					4	0.8
31-40	170	7	2	1		1		11	2.2
41-50	178	9	10		1	1		21	4.2
51-60	65	1	4	2	1	1		9	1.8
>60	27	3	2	2				7	1.4
Total	500	22	30	5	2	3		62	12.4

Table 4: Comparison with other studies

Studies	No. of cases	Unsatisfactory smears	NILM%	SIL%	Invasive CA
Yajima ⁵	959475				0.10
Beinton ⁶	130		59.23	11.15	2.69
Mital ⁷	250		12.70	40.65	6.00
Chauhan ⁸	5778		69.19	2.28	
Spinilla ⁹	1483		9.64		
Tabrizi ¹⁰	460	8.30	23.30	12.58	1.66
Thomas ¹¹	85	5.88		20	
Karuma ¹²	100			12	
Mishra ¹³	764			11.3	
Sherwani ¹⁴	160			11.2	3.7
Kulkarni ¹⁵	640	14.8	72.3	10.5	0.2
Bal MS ¹⁶	300	4	88	3.4	1.3
Present study	500	10.4	77.2	7	0.4

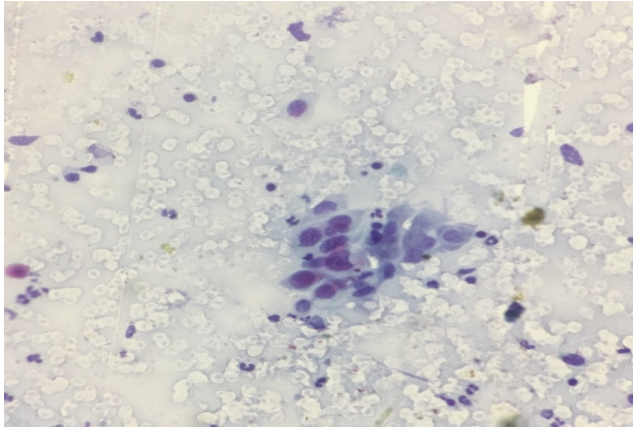


Fig. 1: Low grade squamous intraepithelial lesion, smear is moderately cellular showing mature squamous cells with enlarged nuclei with variable chromatin and nuclear membranes against inflammatory background. (PAP stain 40x)

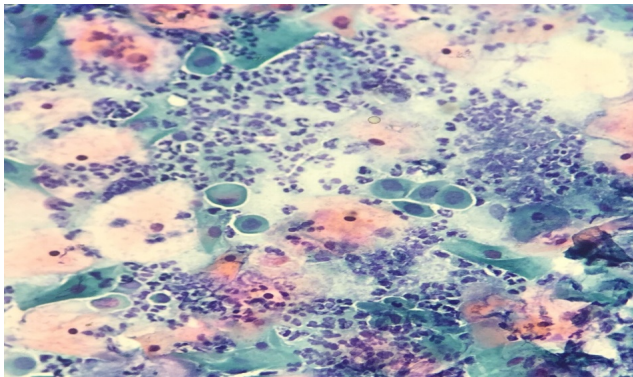


Fig. 2: High grade intraepithelial lesion, smear is moderately cellular showing syncytial cluster with cells of variable nucleocytoplasmic ratios, nuclear size and delicate cytoplasm. (PAP stain 40x)

to evaluate the cytology smears. The terminologies used are helpful to communicate between the laboratory and clinician to provide relevant information regarding the lesion and management of patients. Another reason is that TBS uses diagnostic categories terminology based on underlying pathobiology of cervical lesions.²⁰

5. Conclusion

1. Cervical cancer is one of the most common malignancies among women in India.
2. The incidence of cervical cancer has been reduced significantly after the starting of mass screening programs and awareness campaigns promoting Pap smear as an effective tool for early detection of premalignant and malignant lesions of cervix when it is amenable to simple cure and treatment.
3. It is thus recommended that regular Pap smear screening should be conducted in vulnerable age

group.

4. Relatively low CIN sensitivity can be improved by adequate sampling and avoiding technical error and Bethesda system is recommended for adequacy of sampling to minimize inconsistency.

6. Source of funding

None.

7. Conflict of interest

None.

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