

## Original article

# Analysis of cervical smear cytology: A one year study

Wasim M. Khatib,<sup>1</sup> Pankti M. Patel,<sup>2</sup> Vidya C. Aher,<sup>3</sup> Rakesh B. Demde<sup>4</sup>

1 - Assistant Professor, Department of Pathology, KIMS, Karad, Maharashtra, India.

2 - Assistant Lecturer, Department of Pathology, KIMS, Karad, Maharashtra, India.

3- Assistant Lecturer, Department of Pathology, KIMS, Karad, Maharashtra, India.

4- Assistant Lecturer, Department of Pathology, KIMS, Karad, Maharashtra, India.

Corresponding author - Dr. Wasim M. Khatib , Assistant Professor, Department of Pathology, KIMS, Karad , Maharashtra, India.

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### Abstract:

**Background:** Squamous cell carcinoma of the cervix is the most common preventable and curable disease of the cervix. Carcinoma cervix is the second most cancer worldwide. Cervical smear cytology is the standard screening test for detection of malignant and pre-malignant lesions and has been proved over the years to be a reliable investigation in the detection of squamous intraepithelial lesions.

**Materials and Method:** The present study is a cross-sectional, descriptive and analytical type of study, carried at rural tertiary care hospital over a period of one year from January 2015 to December 2015. All the cervical smears received in the department of pathology were stained with Papanicolaou stain and were studied. The Bethesda system (TBS) 2001 was employed for reporting of those smears.

**Observation:** A total of 403 cervical smears were received over the period of one year. Most of them were inflammatory in nature with 169 (41.93%) cases. Among non-neoplastic lesions, after acute inflammatory etiology, most common was candidial with 16 (3.97%) cases followed by trichomonal infection with 12 (2.97%) cases. Among epithelial lesions, most common was LSIL with 17 (4.21%) cases. Squamous cell carcinoma (SCC) was diagnosed in 4 (0.99%) cases. Most common presenting symptom was PV discharge, seen in 193 (47.89%) cases. Mean age affected was 40.2 years.

**Conclusion:** Cervical cytology is a simple, essential screening tool for detection of pre-malignant and malignant lesions of cervix. Along with neoplastic, non-neoplastic lesions can also be diagnosed with fair accuracy.

**Keywords:** Papanicolaou smear, LSIL, HSIL

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### Introduction:

The uterine cervix is a dynamic organ owing to various lesions that occur there in. Cervical infections include acute inflammatory lesions, granulomatous inflammations, fungal and parasitic inflammation. Cervical cancer is the most common cancer after breast and colorectal cancer among women worldwide.<sup>[1]</sup> However, cervical cancer is the leading cause of morbidity and mortality in developing countries like India.<sup>[2]</sup> It is estimated that, in India, 1,26,000 new cases of cervical cancer occur annually.<sup>[3]</sup> Apart from cervical epithelial cell

abnormalities, the cervical smears, i.e. PAP smears can diagnose an array of infections and inflammatory conditions.

Cervical screening can be performed via conventional Papanicolaou smears and Liquid base cytology. Each one has its own pros and cons. In 1940, Dr. George Papanicolaou, introduced for the first time PAP smears for the early detection of cervical malignancy.<sup>[4]</sup> Ever since the introduction of this test, the squamous cell abnormalities can be detected at much earlier stages leading to early treatment and better patient care.<sup>[5,6]</sup>

Owing to the success of the conventional PAP method, there was a need to standardise the reporting system. Hence, in 1988, The Bethesda system (TBS) was developed as a uniform system of terminology for inflammatory, infectious and squamous intra epithelial lesions of cervix.<sup>[7, 8, 9]</sup>

There are guidelines regarding the frequency of testing. Depending on the level of suspicion, the test can be performed on all women in reproductive age group, twice in a year to once in 3-5 years.<sup>[10]</sup>

Various countries, in the developing and developed world have intensified the cervical screening program. As a result, there has been a drastic reduction in mortality and morbidity due to carcinoma of cervix.<sup>[11]</sup> Due to its simplicity and cost- effectiveness, PAP test is widely popular among symptomatic as well as asymptomatic women.

**Materials and method:**

The present work is a cross-sectional, descriptive and analytical type of study, carried at a rural tertiary care hospital over a period of one year from January 2015 to December 2015. All the cervical

smears received in the department of pathology were stained with Papanicolaou stain and were studied. The cervical smears were collected by the gynaecologists using Ayre’s spatula. The material obtained was quickly smeared on a clean glass slide and slides were immediately fixed with cytofixative in separate Coplin jars. Rapid PAP kit was employed for staining of the smears. The Bethesda system (TBS) 2001 was employed for cytological interpretation of those smears. The clinical history was obtained from the cervical smear requisition sheets and gynaecologists. History included menstrual dating, age, presenting symptoms, parity and radiological investigations.

**Observation:**

A total of 403 cervical smears were received over the period of one year. Most common age group affected was the 31-40 year with 140 (34.73%) cases, followed by 41-50 years age group with 89 (22.08%) cases. Age range was from 18 to 88 years with mean age of presentation being 40.2 years.

[Table 1]

**Table 1. Age wise distribution of cases**

Age group	No. of cases	Percentage
< 20 years	02	0.49
21-30	97	24.06
31-40	140	34.73
41-50	89	22.08
51-60	43	10.66
61-70	21	05.20
71-80	7	01.73
>80 years	4	0.99
Total	403	

Of the 403 cases, majority were acute inflammatory in nature with 169 (41.93%) cases. 77 (19.10%) cases were termed inadequate due to various reasons such as low cellularity, absence of endocervical cells. 13 (3.22%) cases were

diagnosed within normal limits. 49 (12.15%) were diagnosed as negative for intraepithelial malignancy. We came across 29 (7.19%) infections other than acute inflammatory etiology. There were 16 (3.97%) cases of candidal infection, 12 (2.97%)

cases of trichomonas infection and a single case of Aspergillois. We noted a single case of granulomatous inflammation. 10 (2.48%) cases

showed mild cytological atypia with HPV effect however the atypia was very mild to be termed as intraepithelial lesion. [Table2]

**Table 2. Distribution according to diagnosis**

Diagnosis	No. of cases	Percentage
Normal	13	03.22
Inadequate	77	19.10
Inflammatory	169	41.93
Negative for intraepithelial malignancy	49	12.15
Trichomonial infection	12	02.97
Aspergillus infection	01	0.24
Candidial infection	16	03.97
Granulomatous infection	01	0.24
HPV change	10	02.48
ASCUS	13	03.22
LSIL	17	04.21
HSIL	09	02.23
Suspicious for malignancy	06	01.48
SCC	04	0.99
Radiational effect	06	01.48
Total	403	

We came across 04 (0.99%) cases of frank squamous cell carcinoma (SCC). Individual cells were pleomorphic, having large N: C ratio, hyperchromatic nuclei with nucleoli on a necrotic background. Low grade squamous intra-epithelial (LSIL) lesions were the most common among intra-epithelial lesion with 17 (4.21%) cases. ASCUS comprised of 13 (3.22%) of cases. We studied 09 (2.23%) cases of high-grade intra-epithelial lesion (HSIL). In 06 (1.48%) cases, cellular features could not be classified as overtly malignant or HSIL, we classified them as

suspicious for malignancy.06 (1.48%) cases were known cases of SCC under treatment and showed typical radiation induced changes on cytology. [Table 2]

In the present study 193 (47.89%) patients presented with PV discharge which was the predominant symptom, followed by irregular menses with 89 (22.08%) cases. Post coital bleeding was noted in 22 (5.45%) cases. 54 (13.39%) patients presented with abdominal pain. [Table 3]

**Table 3. Distribution according to clinical presentation**

Presenting symptoms	No. of cases	Percentage
PV Discharge	193	47.89
Menstrual irregularity	89	22.08
Abdominal pain	5	13.39
Post coital bleeding	22	05.45
Per vaginal bleeding	16	03.97
Other	29	07.19
Total	403	

Out of 403 cases, majority 169 (41.93%) had acute inflammatory etiology, of which majority 73 (18.11%) cases were in 41-50 years age group, followed by 51-60 with 61 (15.13%) patients. There was a single patient between 71-80 age group. Two patients were below 20 years of age. A 49 years female was diagnosed with granulomatous inflammation however 20% AFB revealed. We came across 16 (3.97%) cases of candida infection. Most of the patients affected were young with most

common age group affected was 21-30 years with 08 (1.89%) cases, followed by 05 (1.24%) cases in age group of 31-40 years. When compared to candidal infection, trichomonal infection was noted in older age group. There were 12 (2.97%) cases of trichomonal infection, most of which were in 41-50 years age group with 06 (01.48%) cases, followed by 03 (0.74%) cases and 02 (0.49%) cases in 61-70 years age group. [Table 4]

**Table 4. Age wise distribution of epithelial abnormalities**

Age group	Acute infection	Granulomatous infection	Trichomonas infection	Candida infection	Aspergillus infection
<20	02	-	-	-	-
21-30	07	-	-	08	-
31-40	16	-	01	05	-
41-50	73	01	06	03	01
51-60	61	-	03	-	-
61-70	09	-	02	-	-
71-80	01	-	-	-	-
>81	-	-	-	-	-
Total	169	01	12	16	01
Percentage	41.93	0.24	02.97	03.97	0.24

Among intraepithelial lesions, majority of the lesions were LSIL with 17 (4.64%) cases. All the cases were seen beyond 40 years of age with maximum in 51-60 years with 07 (1.73% cases).

There were two cases with age beyond 80 years. High grade lesions were also noted in the 51-60 years age group predominantly with 04 (0.99%) cases. [Table 5]

**Table 5. Age wise distribution of squamous cell abnormality**

Age group	ASCUS	LSIL	HSIL	SCC
<20	-	-	-	-
21-30	-	-	-	-
31-40	06	-	-	-
41-50	05	03	01	-
51-60	01	07	04	01
61-70	01	03	02	03
71-80	-	02	02	-
>81	-	02	-	-
Total	13	17	09	04
Percentage	03.22	04.64	02.23	0.99

**Discussion:**

Cervical screening is as effective tool for diagnosis of malignant and pre-malignant lesions of the cervix. Although worldwide cervical cancer is the second most common cancer in females, the incidence of cervical cancer is on the decline due to the success of cervical screening.<sup>[12,13,14,15]</sup>

The mean age of the patients with abnormal cervical cytology in our study was 40.2 years. Our findings were in concordance with rather studies.<sup>[16]</sup> Per vaginal discharge was seen in 47.89% cases in our study and were the most common presenting symptoms. Our findings were in concordance with other studies.<sup>[8,16]</sup>

Acute inflammation was the most predominant diagnosis in our study. This was in agreement with other studies such as Beinton et al, Chauhan et al.<sup>[17,18]</sup> We had 12.15 % cases diagnosed as negative for intraepithelial lesion. We had an abnormally high inadequate cervical smear rate with 77 (19.10%) cases. Other studies show an inadequate rate less than 8 to 10 %.<sup>[19,20]</sup> This indicated a need for improved technique. Out of 403 cases, 49 (12.15%) cases were diagnosed with

epithelial cell abnormalities. Various studies have shown similar results.<sup>[21,22]</sup>

In our study, amongst epithelial cell abnormalities, maximum cases were LSIL (04.21%). We noted 04 (0.99%) cases of frank malignancy. High grade lesions comprised of 02.23% of all cases. ASCUS was diagnosed in 03.22% cases. All these findings were comparable to other studies such as Beinton et al, Karuma et al and sherwani et al. <sup>[17,23,24]</sup>. We however had slightly lower occurrence of squamous cell carcinoma in our study.

**Conclusion:**

As seen in our study an array of lesions can be potentially diagnosed reliably on smear cytology. A point of note is that proper technique and time of sample collection should be emphasized. This could lead to reduction in inadequate smears and improvising the smear quality. Being the most economical, non-invasive, patient compliant and largely successful method of cervical screening, the conventional PAP smear when performed under standard protocol and good clinical correlation will go a long way in reducing patient morbidity and mortality.

## References:

1. Parkin DM, Bray F. The burden of HPV- related cancers. *Vaccine*. 2006;24 (3):11-25.
2. Patel MM, Pandya AN, Modi J. Cervical Pap smear study and its utility in cancer screening to specify the strategy for cervical cancer control. *Natl J Community Medicine*. 2011;2(1).
3. Sankarnarayanan R, Nene BM, Dinshaw K, et al. Early detection of cervical cancer with visual inspection methods: a summary of completed and ongoing studies in India. *SaludmPublica Mex*. 2003;45:399-407.
4. Papanicolaou GN. Introduction of Pap smear in early detection of cervical malignancies. *Am J Clin Path*. 1940;19:301-308.
5. Jonathan SB. Berek and Novak's *Gynecology*- 14<sup>th</sup> edition. Philadelphia: Lippincott William Wilkins. 2006:569-575.
6. Leopold K. The new Bethesda System for reporting results of smears of uterine cervix. *J Natl Canc Inst*. 1990;82(12):988-990.
7. Richart RM. A modified terminology for cervical intraepithelial neoplasia. *Obst Gynecol*. 1990;75:131-133.
8. Pradhan B, Pradhan SB, Mital VP. Correlation of Pap smear findings with clinical findings and cervical biopsy. *Med J Kathmandu University*. 2007;5(20):461-467.
9. Solomon D, Nayar R. *The Bethesda System for cervical cytology: Definitions, Criteria and Explanatory Notes*. 2<sup>nd</sup> edi. New York, Springer; 2004:v-vii.
10. Saslow et al. American Cancer Society, American Society for colposcopy and cervical pathology and Society for clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. *J Lower Genital Tract Disease*. 2012;16(3):175-204.
11. Ferlay J, Shin HR, Bray F, et al. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *Intl J Cancer*. 2010;127(12):2893-2917.
12. Ferlay J, Parkin DM, Pisani P. *Globocon 2002 Cancer incidence, mortality and prevalence worldwide*, International Agency for Research on cancer. IARC Cancer Base no 5, version 2.0 Lyon, France: IARC press, 2004.
13. Herrero R. Epidemiology of cervical cancer. *J Natl Cancer Inst Monogr*. 1996;21:1-6.
14. Eddy DM. Screening for cervical cancer. *Ann Intern Med*. 1990;113:214-26.
15. Van der Graaf Y, Klinkhamer PJ, Voojis Gp. Effect of population screening for cancer of uterine cervix in Nijmegen, the Netherlands. *Prev Med*. 1986;15:582-90.
16. Ranabhat SK, Shrestha R, Tiwari M. Analysis of abnormal epithelial lesions in cervical Pap smears in Mid-Western Nepal. *J Patho*. 2011;1:30-33.
17. Sankarnarayanan R, Thara S, Sharma A, et al. Accuracy of conventional cytology: results from a multicenter screening study in India. *J Med Screen*. 2004;11:77-84.
18. Gupta S, Sodhani P, Chachra KL, et al. A outcome of squamous cells in a cervical cytology screening program: Implications for follow up in resource limited settings. *Diagn Cytopathol*. 2007;35:677-80.
19. Beinton A, Palintasa, Barrett Conner; estrogen depressive symptoms in postmenopausal women. *J of Obst Gynecol*. 1986;80(1):30-33.
20. Chauhan SH, Tayal OK, Kalia IJ. Detection of uterine cervical dysplasia and carcinoma cervix. *Indian J of Obst Gynecol*. 1997;20(5):167-71.
21. Turkish Cervical Cancer and Cervical Cytology Research Group: Prevalence of cervical cytological abnormalities in Turkey. *Int J Gynecol Obstet*. 2009;106:206-209.
22. Ghaith JE, Rizwana BS. Rate of opportunistic Pap smear Screening and patterns of epithelial cell abnormalities in Pap smears in Ajman United Arab Emirates. *Sultan Qaboos Univ Med j*. 2012;12(4):475-478.
23. Karuma, Gaspanal V, Van- Dan Brule R. The clinical profile and cervical cytomorphology. *Indian J Pathol Microbial*. 2003;46(2):179-89.

24. Sherwani RK, Khan T, Akhtar K, Zeba A, et al. Conventional Pap smears and Liquid based cytology for cervical cancer screening- A comparative study. J Cyto.2007;24(4):167-172.