



# COMPARISON OF CONVENTIONAL CERVICAL CYTOLOGY IN WOMEN WITH HEALTHY AND UNHEALTHY LOOKING CERVIX

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## ABSTRACT

**Objectives:** To compare conventional cervical cytology in women with healthy/unhealthy looking cervix.

**Methods:** A prospective study on conventional cervical cytology was performed including 340 women, 174 with healthy looking cervix, 160 with unhealthy looking cervix and 6 with absent cervix (post hysterectomy), attending the Gynecologic outpatient department at a tertiary care hospital in Bhavnagar district of Gujarat state. Cytological findings including incidence of inflammatory smears and epithelial abnormalities were compared between the two groups.

**Results:** The demographic profile difference between the two groups was statistically non-significant. Overall incidence of squamous cell abnormality was 4.1 % and of glandular cell abnormality was 1.2%. Incidence of squamous cell abnormalities increases as the age of patients increases, highest incidence were seen in 61-70 years age-group. Inflammatory smears were common in women with unhealthy cervix ( $p=0.0001$ ), however difference in epithelial abnormalities between the two groups were statistically non-significant ( $p=0.248$ ).

**Conclusion:** Inflammatory smears were higher among the women with unhealthy cervix in comparison to healthy cervix but the differences in epithelial abnormalities between the two groups were statistically non-significant. Hence this study emphasizes on the importance of universal screening of both the groups.

**Key Words:** Pap smear, Bethesda, Cervical erosion, Squamous Intraepithelial Lesion (SIL).

## INTRODUCTION

Cancer of the uterine cervix is the second most common cancer among women in the world after breast cancer. Cervical cancer accounted for 493 000 new cases and 273 000 deaths in 2002 worldwide. More than 80% of the cervical cancer cases occurred in developing countries.<sup>1</sup>

Taking the lives of 75,000 women each year, cervical cancer is the leading cause of death for women in India. This number accounts for a third of all cancers that affect women in India. The age-specific incidence rates (ASIR) for cervical cancer revealed that the disease increases from 35 years and reaches a peak between the ages 55 to 64 years<sup>2</sup>. The differential pattern of cervical cancer and the wide variation in incidence are possibly related to environmental differences. Etiologic association and possible risk factors for cervical carcinoma have been extensively studied. The factors are: Sexual and reproductive factors, socio-economic factors

(education and income), viruses e.g., herpes simplex virus (HSV), human papilloma virus (HPV), human immunodeficiency virus (HIV) and other factors like smoking, diet, oral contraceptives, hormones, etc.<sup>3</sup>

Indian study found that about two thirds of women with invasive cancer were detected through visual inspection of cervix using a speculum and light source. Cancer indicators are small growths, cervical erosion that bleeds on touch, 'suspicious' looking cervix. It primarily identifies invasive cancer, not precancerous conditions.<sup>4</sup>

Historical study has found a positive correlation between the decrease in mortality from carcinoma cervix and the rate of cytological screening.<sup>5,6,7</sup> The overall results of various studies reaffirm that cervicovaginal cytology (Pap smear) remains the most inexpensive and effective tool for the elimination of cervical cancer.<sup>6</sup>

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Since data from Gujarat is not well documented and since no other previous study of Pap smears was ever conducted in Bhavnagar district, the present study was conducted on the patients having various symptoms related to lower genital tract and/or having unhealthy looking cervix, attending the outpatients department of gynecology at Sir T. Hospital, Bhavnagar, to compare the incidence of intraepithelial neoplasm & invasive carcinoma of cervix and various genital tract infections in women with healthy/unhealthy looking cervix.

## MATERIALS AND METHODS

Study was conducted over a span of 16 months at a tertiary care hospital in Bhavnagar on women attending the Gynaecologic outpatient department having various symptoms related to lower genital tract and/or having unhealthy looking cervix. Three patients of physical fitness with no complaints were also included in this study. Unhealthy and healthy cervix was judged during per speculum examination. The cervix was considered healthy if it didn't had any abnormalities in terms of size, shape, position, colour and surface irregularity, otherwise it was considered as unhealthy. As antimicrobial therapy was given according to clinical suspicion and followed up if symptoms and/or signs persisted, such patients were also taken up for this study.

Complete history including complaints, personal and marital history was noted. Material was collected from the ecto cervix by cervical scrapping with the help of an Ayre's wooden spatula and from endocervix with cytobrush and immediately smeared on a clean glass slide that was premarked as 'ecto' or 'endo' with patient's identity. Smears were stained by rapid Pap method and reported according to the Bethesda system (2001). The patients with abnormal Pap smear findings and unsatisfactory Pap smears were further evaluated by repeat Pap smear examination or cervical biopsy.

**Statistical analysis:** The *P*-value was calculated using Chi-square and Student's *T* tests.

## RESULTS

Out of a total 340 patient between the ages of 20-103 years examined, 174 had healthy looking cervix, 160 had unhealthy looking cervix and 6 were of total hysterectomy without cervix. All except one were married, with mean age at marriage being 19 years. 6 patients were of total hysterectomy in which vaginal vault smears were taken. 111 were post menopausal. Follow up Pap smear examination was done in 6 patients and the follow up Pap smear findings were same as the first diagnosis in all cases except in one in whom previous unsatisfactory result became satisfactory on follow up.

Overall incidence of different Bethesda's reporting categories was shown in **Figure 1**.

Age-wise incidence of various Bethesda's reporting categories was shown in **Figure 2**. It was evident from Fig.-2 that in present study incidence of squamous cell abnormalities increases as the age of patients increases. It increased from 1.72% in the 31-40 years age group to 25% in the 61-70 years age group. Although it appears low in >70 years age group, it can't be concluded; it could be due to the reason that total number of patient in >70 years age-group were only 7. Glandular cell abnormalities were detected only in age group 41-50 & 61-70 years. Highest incidences of epithelial cell abnormalities (squamous as well as glandular) were seen in 61-70 years age-group.

Difference in various demographic profile like age, age at marriage, parity between women with healthy and unhealthy cervix were statistically non significant as shown in **Table-1**.

Chief complaint wise distribution of women with healthy and unhealthy cervix was shown in **Table 2**. It is evident from Table-2 that, common histories among both the groups include excessive white discharge, post menopausal bleeding, uterine prolapse and menorrhagia. A history of excessive white discharge was more often present in women who had unhealthy cervix (61.2%) than healthy cervix (32.8%). The difference was statistically significant ( $p < 0.0001$ ). A history of menorrhagia was more often present in women who had healthy cervix (23%) than unhealthy cervix (7.5%). The difference was statistically significant ( $p < 0.05$ ).

Comparison of Pap smear findings in women with healthy and unhealthy cervix was shown in **Table 3**. It is evident from Table 3 that 31 Pap smear results were unsatisfactory for evaluation – 10 were obscured by blood, 8 were obscured by inflammation, 5 were obscured by blood and inflammation, 6 due to low squamous cellularity and 2 due to poor fixation of smear. For unsatisfactory smears difference between the two groups was statistically non-significant ( $p = 0.15$ ). Incidence of inflammatory smears was more prevalent in women having unhealthy cervix than in women having healthy cervix and the findings were statistically significant ( $P = 0.0002$ ). Incidence of epithelial abnormality was appeared to be more prevalent in women having unhealthy cervix (6.87%) than in women having healthy cervix (4.02%). Though intraepithelial lesions and invasive cancer were detected only in women having unhealthy cervix, due to low prevalence of epithelial abnormality in our study, the findings were statistically non-significant ( $P = 0.248$ ).

## DISCUSSION

Due to shortage of resources, lack of awareness, cultural barrier and economic factors, though a regular routine cervical

cytology screening in all sexually active women is recommended to reduce morbidity and mortality from cancer cervix, this has not been feasible yet in our country especially in remote areas. This study was done to assess the need of routine screening in women with healthy cervix by comparing the results of cervical cytology among women with healthy and unhealthy cervix.

In this study 9.4% Pap smear results were unsatisfactory for evaluation. Incidence of unsatisfactory smears in healthy looking cervix was 11.49% compared to 6.87 % in unhealthy cervix. As many patients in 'healthy cervix' group had complaint of menorrhagia and the high unsatisfactory rate was due to excessive blood obscuring squamous cells.

Cases with healthy cervix also showed presence of acute inflammatory cells, reactive changes due to inflammation & epithelial cell abnormalities, although most had mild degree of acute inflammation and 2.87 % cases showed ASC-US, however more severe changes were not noted.

Although 5 out of 174 cases with normal looking cervix showed squamous cell abnormality, all the 5 abnormalities were ASC-US. In high risk groups, 2/61 cases (1 ASC-US & 1 ASC-H) of cervical erosion, 2/73 cases (both ASC-US) of cervicitis, 2/4 cases (1 ASC-H, 1 HSIL) of cervical bleeding on touch, 2/8 cases (1ASC-H, 1 LSIL) of cervical hypertrophy, 1/4 cases (SCC) of nodular growth over cervix showed squamous cell abnormalities. Thus though squamous cell abnormalities were also seen in cases with normal looking cervix, the incidence was low and the abnormalities were of low grade or of undetermined significance than the abnormalities seen in patients with unhealthy looking cervix.

Incidence of SIL & invasive carcinoma was 0.87 % and all cases were seen in patients older than 50 years of age. They presented with complaints of post menopausal bleeding and on per speculum examination all had unhealthy looking cervix- either nodular growth or hypertrophy or bleeding on touch.

Majority of the patients with excessive white discharge, menorrhagia, and uterine prolapse were NILM on Pap smear. However in comparison to postmenopausal bleeding, post coital bleeding, patients of uterine prolapse and excessive white discharge showed epithelial cell abnormalities whereas patients with blood stained vaginal discharge showed no epithelial cell abnormality indicating that not all conditions traditionally linked with abnormal Pap smear gave abnormal results and even conditions not associated with unhealthy looking cervix or traditional symptoms related to epithelial cell abnormality gave abnormal Pap results.

Percent of cases noted according to per speculum findings in Western zone of India were shown in **Table 4**. The total incidence of unhealthy looking cervix was almost equal in

studies done by D Pandit et al<sup>8</sup> and in present study. Similar findings were reported by other authors.

Percent of cases in different studies falling in normal, inflammation, reactive, epithelial cell abnormality, specific organism & unsatisfactory categories were shown in **Table 5**. It was evident from Table 5 that

In the normal smears category, the result of present study was comparable with studies done by others except study done by Anita N Kavatkar et al<sup>9</sup> as they had included both NILM & NILM with presence of nonspecific inflammation in the normal smears category.

Incidence of inflammatory smears was higher in studies done by D Pandit et al<sup>8</sup> and Kalavathy et al<sup>10</sup> than the present study, but it was largely due to the use of old Pap reporting system by both of them, which does not separate categories like 'reactive changes associated with inflammation; atrophy with inflammation' and includes them in inflamed category.

In present study, incidence of reactive changes was comparable with the study done by Anita N Kavatkar et al<sup>9</sup> as both studies were done on hospital based population.

Incidence of Epithelial cell abnormality was higher in present study compared to studies done by others. The difference in the incidence of epithelial cell abnormalities were mostly due to difference in geographic area of study and difference in the socioeconomic standards, racial, religious and other ethnic factors peculiar to the population studied. As our study was done on Hospital based patients and majority of them were of low socioeconomic class and more than 50% were from rural areas having poor genital hygiene and early age at marriage.

Incidences of Trichomonas Vaginalis and Candidiasis were low in our study as many of patients were given specific antimicrobial therapy according to clinical findings and only when there was no relief of symptoms, Pap smear was taken on follow up.

In present study, incidence of unsatisfactory smears was comparable with the study done by Anita N Kavatkar et al<sup>9</sup>, as both studies had used the latest Bethesda reporting system (2001). Unsatisfactory rate was lower in study done by D Pandit et al<sup>8</sup> as they had used old Pap reporting system in which clear cut criteria for specimen satisfaction was not laid down.

## CONCLUSION

Inflammatory smears were higher among the women with unhealthy cervix in comparison to healthy cervix but the differences in epithelial abnormalities between the two groups

were statistically non-significant. Epithelial abnormality was seen in quite a number of women with healthy cervixes, thus there is no precise clinical indicator to suspect cervix with epithelial abnormality. Hence it is necessary for all sexually active women to undergo routine cervical cytological screening whether the cervix looks healthy or not.

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**Table 1: Demographic profile of women with healthy and unhealthy cervix**

Age Distribution			Age at marriage			Parity		
Age Groups	Healthy Cervix (n=174)	Unhealthy Cervix (n=160)	Age	Healthy Cervix (n=174)	Unhealthy Cervix (n=160)	Parity	Healthy Cervix (n=174)	Unhealthy Cervix (n=160)
20-30	23	44	<20	92	98	0	12	2
31-40	65	50	20-29	81	62	1-2	34	45
41-50	52	36	>30	1	0	3-4	94	82
51-60	16	13	Mean ± SD	19.06 ± 2.36	19.09 ± 2.37	> 5	34	31
61-70	15	13	P value	0.90		Mean ± SD	3.35 ± 1.59	3.34 ± 1.60
>70	3	4				P value	0.98	
Mean ± SD	42.87 ± 13.84	42.86 ± 13.79						
P value	0.99							

**Table 2: Chief complaint wise distribution of women with healthy and unhealthy cervix**

Chief complaint	Healthy Cervix (%)	Unhealthy Cervix (%)	P value
Excessive white discharge	57 (32.8)	98 (61.2)	< 0.0001
Blood stained vaginal discharge	9 (5.2)	5 (3.1)	0.35
Intermenstrual / post coital bleeding	7 (4)	12 (7.5)	0.17
Postmenopausal bleeding	20 (11.5)	15 (9.4)	0.53
Uterine prolapse	22 (12.6)	15 (9.4)	0.34
Menorrhagia	40 (23)	12 (7.5)	< 0.05
Lower abd. Pain	4 (2.3)	3 (1.9)	0.79
Fibroid	5 (2.9)	0	0.03
Burning/Itching on perineum	5 (2.9)	0	0.03
Burning micturition	2 (1.1)	0	0.17
No complaints	3 (1.7)	0	0.09
Total	174 (100)	160 (100)	

**Table 3: Comparison of Pap smears findings in women with healthy and unhealthy cervix**

Pap smear finding	Healthy cervix (%) N=174	Unhealthy cervix (%) N=160	P value
Unsatisfactory			
Total	20 (11.49)	11 (6.87)	0.15
Only NILM			
Total	67 (38.50)	32 (20.0)	0.0002
NILM-Inflammatory smears			
NILM-Acute inflammation	51 (29.31)	64 (40.0)	
NILM-Reactive due to inflammation	11 (6.32)	13 (8.12)	
NILM-with specific organism	12 (6.89)	24 (15.0)	
NILM-with atrophy	1 (0.57)	0	
NILM-with atrophy and inflammation	5 (2.87)	5 (3.12)	
Total	80 (45.97)	106 (66.25)	0.0001
Epithelial abnormality			
ASCUS	5 (2.87)	3 (1.87)	
ASC-H	0	3 (1.87)	
LSIL	0	1 (0.62)	
HSIL	0	1 (0.62)	
SCC	0	1 (0.62)	
Atypical endocervical cell-NOS	1 (0.57)	1 (0.62)	
Atypical endometrial cell-NOS	0	1 (0.62)	
Atypical glandular cell-NOS	1 (0.57)	0	
Total	7 (4.02)	11 (6.87)	0.248

**Table 4: Percent of cases noted according to per speculum findings in Western zone of India**

Per Speculum Findings	D. Pandit et al.36 (Total cases-164)	Present study (Total cases-340)
Cervical erosion	20.73 %	17.94 %
Cervical Congestion	6.71 %	-
Cervical Growth	1.22 %	1.17 %
Polyp	4.27 %	-
Vaginitis/cervicitis	14.02 %	21.46 %
Bleeds on touch	-	1.17 %
Hypertrophy	-	2.34 %
Everson	-	0.29 %
Ulceration	-	2.05 %
Cervical elongation	-	0.58 %
Total	46.95 %	47.00 %
Normal looking	53.05 %	53.00 %

**Table 5: Comparison of cervical cytological findings in recent studies from western zone of India**

PAP Smear Findings	D. Pandit et al.36	Kalavathy37	Anita N Kavatkar17	Present study
Normal	25.61 %	37.00 %	69.18* %	30.00 %
Inflammation	59.76 %	41.15 %	-	33.84 %
Reactive changes	-	-	14.8 %	10.88 %
Epithelial cell abnormality	2.44 %	1.55 %	3.69 %	5.30 %
Trichomonas Vaginalis	5.49 %	6.2 %	1.23 %	0.88 %
Candidiasis	3.05 %	6.5 %	1.23 %	-
Bacterial vaginosis	-	7.6 %	-	9.70 %
Unsatisfactory	3.65 %	-	9.87 %	9.4 %

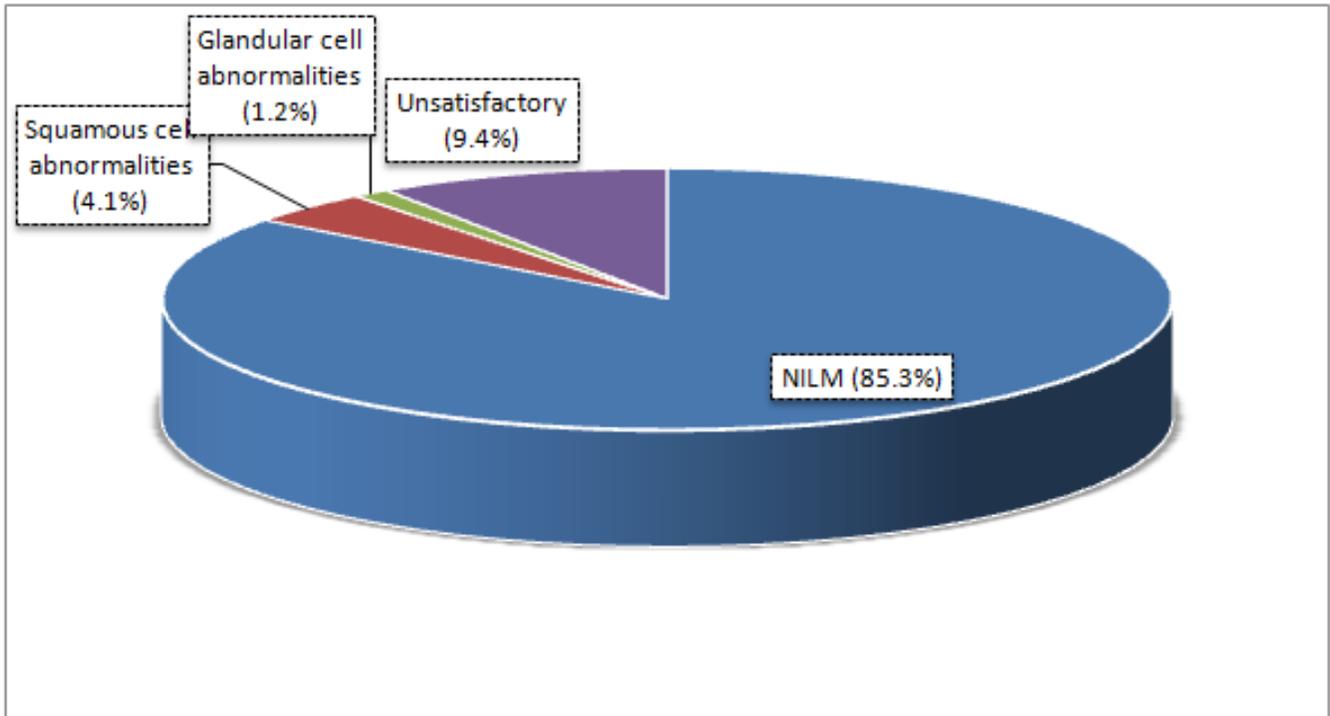


Figure 1: Incidence of various Bethesda's categories on Pap smear.

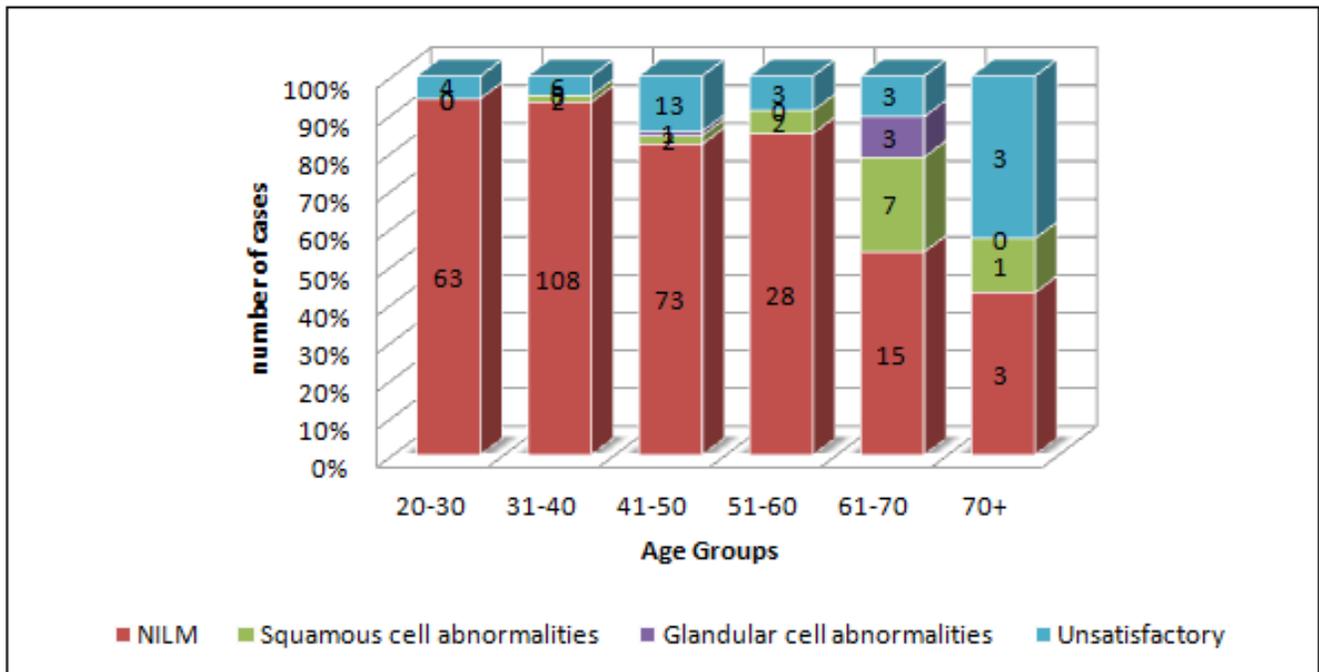


Figure 2: Age-wise incidences of various Bethesda's categories on Pap smear.