



CYTOMORPHOLOGICAL SPECTRUM OF PAPANICOLAOU SMEARS - A HOSPITAL BASED RETROSPECTIVE STUDY

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ABSTRACT

Cervical cancer is second most common cancer of women in India. Screening of cervical cytology by simple papinocolou smear is an effective tool to detect premalignant lesions of cervix. Present study was retrospectively done to determine the cytomorphological spectrum of various cervical lesions and categorize them according to Bethesda system. All the patients presenting in gynaecological OPD and health camps with gynaecological complaints were included and subjected for PAP smear. Most common complaint and physical examination finding was abnormal vaginal discharge (46.3%) and erosion on cervix (46%) respectively. A total of 300 cervical smears were evaluated out of which 22 (7.3%) cases were unsatisfactory for evaluation, 49 (16.3%) were Negative for intraepithelial lesion or malignancy (NILM) and 196(65.3%) of NILM inflammatory category. Epithelial cell abnormality were seen in 33 (11%) with ASCUS in 15 (5%), LSIL in 12 (4%) and HSIL in 6(2%) cases. Maximum number of abnormal cases 15 (5.3%) were in age range 40-49. Cases of carcinoma were not encountered. The study enforces the significance of PAP smear screening in all the women at appropriate interval for reducing prevalence of cervical cancer in developing country like India.

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INTRODUCTION

Cancer cervix is a disease of global burden and stands as third most common cancer in women worldwide (Sreedevi A *et al* 2015). In India it is second most common cancer with a peak incidence 55-59 years (Dhananjaya S *et al* 2014) Mortality varies eighteen fold between the different regions of the world, with rates ranging from less than 2 per 100,000 in Western Asia, Western Europe and Australia/New Zealand to more than 20 per 100,000 in Melanesia, Middle and Eastern Africa as per GLOBACON cancer fact sheet. According to world health organization approximately 80% of cervical cancer deaths occurred in developing countries. In India the mortality rate varies between 9.8-17.5 per 100,00. Without urgent intervention, deaths due to cervical cancer are projected to rise by almost 25% over the next 10 years. (Consul S *et al* 2012)

The high mortality rates is attributable to the presentation of patient at later stages of disease. It is partly contributed because of subtle clinical features of disease.

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Most of the disease comes into attention only after the onset of symptoms and unfortunately in late stages. One of the major management challenges encountered is late presentation, as more than 56.0% of the cases present in stages III and IV. (Eze JN *et al* 2013). Data suggest that more than half of cervical cancer cases could be prevented through adequate screening. Fifty percent of women diagnosed with cervical cancer have never undergone cervical cytology testing and another 10% have not received screening in the five years preceding their diagnosis. Furthermore, cervical cancer is very rare among screened women as less than 10 per 100,000 annual (Sokol RJ *et al* 2003). This outlines the significance of regular and periodic screening of all sexually active women. The cancer in spite of being highly prevalent is easily preventable by routine screening of cervical cytology by simple Papanicolaou smear.

The incidence of squamous cell carcinoma of cervix has been reduced significantly since the introduction of PAP smear. It has been proved to be a highly effective tool for detecting CIN and early cervical cancer so that the condition can be managed or treated to prevent disease progression. (Vesco KK *et al* 2011). The sensitivity of the test can be increased by cotesting with HPV DNA (Bamanikar SA *et al* 2014) However, the recommendation on age group and frequency of testing varies among different countries. According to the The

American Cancer Society Guidelines for the Prevention and Early Detection of Cervical Cancer the screening should start at age of 21 years.

Among various preventive strategies annual Pap smear screening programme is still most cost-effective with additional HPV DNA testing being a cost-effective choice under a reasonable threshold of willingness to pay. (Chen MK *et al* 2011). It has been well established that well-organized screening by cytology has substantially reduced the incidence of morbidity and mortality from cervical cancer in developed countries (Hakama M 1986). Strategies that aim to ensure that all the women are screened at appropriate interval and receive adequate follow up are most likely to be successful in further reducing cervical cancer. Therefore the present study is undertaken to determine the cytomorphological spectrum of various cervical lesions.

MATERIAL AND METHODS

This study was conducted on 300 pap smears at Shri Shankaracharya Institute of Medical sciences, Bhilai, Chhattisgarh, India after clearance from the local ethical committee .The study included all patients attending gynecology OPD and health camps with complaints of vaginal discharge, post coital bleeding, inter-menstrual bleeding, dyspareunia, pain in lower abdomen and other gynaecological complaints.

Collection- Pap smear was performed by opening the vaginal canal with a speculum and collecting cells from the outer opening of the cervix at the transformation zone with Ayre’s spatula. The cellular material thus obtained was quickly, but gently smeared on a clean glass slide .Two smears were prepared for each case. Then the smear was immersed and fixed in 95% ethanol. This part of the collection was done by the gynaecologists and the glass slides were sent to department of pathology. The glass slide was then stained according to papanicolaou’s technique (RAPID PAP™ Kit) and the slides were examined under light microscope and were reported by two pathologists. The cytological interpretation of the smears was done according to the new 2001 Bethesda system Analysis- The statistical methodology in this study was done by simple statistical calculation using Microsoft Excel sheet calculation.

RESULTS

A total number of 300 PAP smear were examined. Out of 300 cases majority were in age group 30-39 years followed by 40-49 years. Females more than 60 years contributed only 1.7%. Majority of the females were in the age group 30-50 years. (69%). [TABLE 1].

Table 1 Distribution of cases according to age(n=300)

Age group(years)	Number of Cases	Percentage %
20-29	62	20.7
30-39	104	34.7
40-49	103	34.4
50-59	26	8.7
60 or more	5	1.7
Total	300	100

Out of all 300 smears screened, 22 (7.3%) of the cases were unsatisfactory for evaluation. A total of 278 smears were found to be satisfactory for evaluation. Evaluation of these

278 smears revealed 49 (16.3%) cases Negative for intraepithelial lesion or malignancy (NILM) having normal cytological findings and 196 were NILM inflammatory category (65.3%) showing inflammatory cells along with benign epithelial cell showing nonspecific reactive changes associated with inflammation (Figure 1). A total of 5 cases (1.6%) were atrophic in NILM (Figure 2), 17 cases of bacterial infection and 2 cases of candida in NILM inflammatory category. On the other hand 33 smears (11%) were found to be abnormal having epithelial cell abnormality.

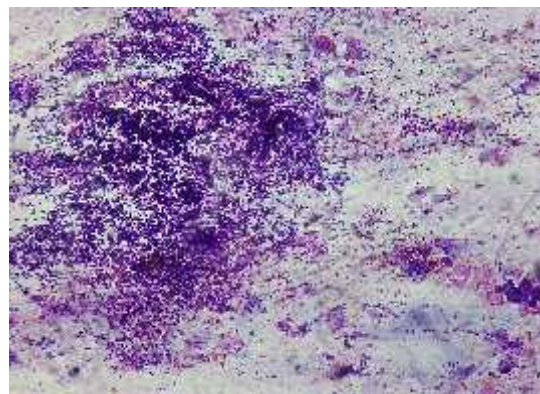


Figure 1 NILM (Negative for Intraepithelial lesion or malignancy) with inflammation

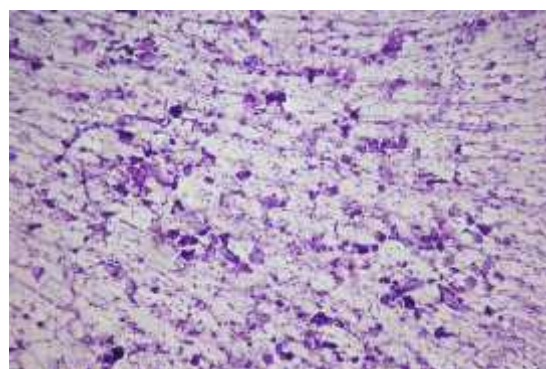


Figure 2 NILM (Negative for intraepithelial lesion or malignancy) Atrophic smears

The abnormal smears were further categorized as ASCUS (atypical Squamous cell of unknown significance), LSIL (low grade squamous intraepithelial lesion) and HSIL (high grade squamous intraepithelial lesion) [TABLE 2]

Table 2 Distribution of Cases according to type of Lesion (n=300)

Sr.No.	Diagnosis	Number of Cases	Percentage (%)
1	Unsatisfactory for evaluation	22	7.3
2	Negative for intraepithelial lesion Normal/ Nos	44	16.3
	Atrophic	5	
3	Negative for intraepithelial lesion Inflammatory	177	65.3
	Bacterial	17	
	Candida	2	
4	ASCUS	15	5
5	LSIL	12	4
6	HSIL	6	2
7	Squamous cell carcinoma	0	0
8	AGCUS	0	0
9	Adenocarcinoma	0	0
10	Others	0	0
	Total	300	100

Maximum number of abnormal cases 15 (5%) were in age range 40-49 years followed by 8 cases(2.6%) in age group 30-39 years. LSIL and HSIL were most common in age group 40-49 years. Cases of carcinoma including squamous cell carcinoma and adenocarcinoma were not encountered .Out of all abnormal smears majority was ASCUS 15 (5%) followed by LSIL 12 (4%)(Figure 3) and HSIL 6(2%).[Table 3]

The most common complaint was abnormal vaginal discharge (46.3%) in 140 females followed by pain abdomen (15.3 %) and intermenstrual and irregular bleeding in (10.3 %) cases. Among the physical examination findings erosion on cervix (46%) was most common finding followed by bulky cervix (10.6%) on per speculum examination.(Table 4)

DISCUSSION

A total of 300 pap smear was collected between January 2016 and February 2017. Out of them a total of 22 (7.3%) of smears were found to be unsatisfactory. The percentage of inadequate smear varies widely between different studies 0.2 to 13.94%. (Misra JS *et al* 2006, Gupta K *et al* 2013).The results of present study is comparable with Bamanikar *et al* 2014 (5.7%) and Bhattacharya *et al* 2016 (8.3%). Appropriate method of collection of smears by gynaecologists in our institute accounted for the higher number of adequate smears. (Table 5)

Table 3 Age – wise distribution of Lesion

Age group (Years)	Number of cases	ASCUS	LSIL	HSIL	Squamous cell carcinoma	AGCUS/ Adenocarcinoma	Total No. of Abnormal finding	Percentage %
20-29	62	3	0	0	0	0	3	1
30-39	104	5	3	0	0	0	8	2.6
40-49	103	4	6	5	0	0	15	5.0
50-59	26	3	3	0	0	0	6	2.0
60 or more	5	0	0	1	0	0	1	0.3
Total	300	15	12	6	0	0	33	11 %

Table 4 Clinical Presentations and distribution of Lesion

Clinical Features	No.of Case	Percentage %	NILM				Squamous cell carcinoma	AGCUS/ Adenocarcinoma
			Inflammatory	ASCUS	LSIL	HSIL		
Vaginal Discharge	140	46.3	94	7	1	2	0	0
Pain In Abdomen	46	15.3	27	1	1	0	0	0
Post menopausal Bleeding	13	4.3	04	1	1	1	0	0
Low back pain	30	10	20	1	1	0	0	0
Burning Micturition	1	0.3	01	0	1	0	0	0
Dysmenorrhea	10	3.3	08	1	2	0	0	0
Post coital bleeding	8	2.6	3	1	2	1	0	0
Prolapse	20	6.6	15	1	2	1	0	0
Intermenstrual bleeding	32	10.6	24	2	1	1	0	0
Total	300	-	196	15	12	6	0	0

Table 5 Comparison of the findings of PAP smear in present study with other studies

Name of author	Number of cases	Inadequate smear (%)	Normal (%)	NILM inflammatory	ASCUS	LSIL	HSIL	Malignancy
Bhattacharya N <i>Bet al</i> (2016)	288	8.3	20	51.4	1.4	8.3	3.5	0.3
Nandwani <i>et al</i> (2016)	5813	5.7	11.8	74.9	3.6	2.5	2.7	3.6
Vaghela <i>et al</i> (2014)	400	13.2	4.5	53	2.8	15	6	3.0
Bamanikar A S <i>et al</i> (2014)	560	5.7	16.9	71.9	2.3	1.9	0.3	0.5
Manjit <i>et al</i> (2012)	300	4	16.7	74.3	0.3	2.7	0.7	1.3
Sherwani <i>et al</i> (2007)	160	69	-	-	-	10.6	0.6	3.7
Karuma <i>et al</i> (2003)	100	-	31	-	6	7	5	-
Present study(2017)	300	7.3	16.3	65.3	5	4	2	-

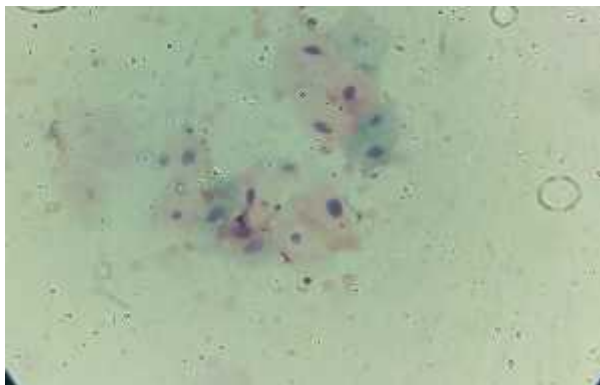


Figure 3 Epithelial cell abnormality - LSIL (Low grade squamous intraepithelial lesion)

The most common complaint recorded was abnormal vaginal discharge 46.3% and most common per speculum finding was cervical erosion (46 %). The PAP smear were done either as part of routine screening procedure or in females with complaints. This was in accordance with Sherwani R K *et al* (2007) and Khattak AT *et al* (2006) in which discharge per vaginum was most common finding in 42.5% and 41 % respectively. In the study by Pradhan *et al* (2007) per vaginal discharge was found to be commonest complaints in different lesion of cervix however bleeding PV is found to be more specific for cervical malignancy. Our study also correlates with the above fact and signifies that PAP smear should always be done in patient with vaginal discharge as it can be a warning symptom for intraepithelial lesions.

The present study revealed 16.3% of smears as NILM with no abnormality which is close to 16.7% and 16.9% reported by Manjit Singh Bal *et al* (2012) and Bamanikar AS *et al* respectively. Some studies have reported a higher percent of NILM including Khattack ST *et al* (2006) as 61.6%. The reason for lower percentage of normal smear as compared to abnormal can be because of increased referral of only symptomatic patients in our tertiary care hospital.

The nonspecific inflammation with no epithelial abnormality was seen in 65.3% cases as compared to Bhattacharya *et al*, (2016) Vaghela *et al* (2014) who reported lower rates. Khattak *et al* (2006) also reported lower percentage as 32%. However studies by other authors have shown a slightly higher rate. [Table 3]. The difference in socioeconomic strata, living conditions and hygienic behaviour may account for the difference. The patient population of women from suburban and near by rural areas mostly from poor socioeconomic status accounted for percentage in present study.

The total of ECA (epithelial cell abnormality) reported in our study was 33 (11%). The percentage of ECA vary widely in different corners of the world and between developed and developing countries with 0.98% in Jewish Israeli women (Banaik U *et al* 2011) to 15.5% in rural population of Zimbabwe (Thistle PJ 1997). The prevalence in US is 2.3-6.6% and in middle east 1.65-7.9%. (Gupta K *et al* 2013). In India the prevalence is 1.3-26.8%. (Vaghela *et al* 2014).

The less number ECA reported in our study may be due vigilant screening of the symptomatic patients in early phases by gynaecologists in our hospital.

The ECA was most prevalent in age group 40-49(50%). Other studies have similar findings Banik U *et al* (2011) who reported EAC peak in more than 45 years and Vaghela *et al* (2014) with maximum ECA (26%) in 40-49 years. Another study from Nepal reported 80% of ECA more than 40 years. (Ranabhat S K 2011) The study enforces the regular and thorough screening by PAP smear in the women above 40 years of age. The higher prevalence of ECA in studies from India and in our study suggests the lack of awareness about routine cervical screening in our women population and unfortunately they presents only when symptomatic and at later stages of disease.

The most frequent ECA in our study was ASCUS (45.4%). Other studies also reported ASCUS as the most common epithelial cell abnormality. (Bamanikar *et al* 2014, Patel *et al* 2004, Ghaith J.E. *et al* 2012). The ASCUS to SIL ratio in our study was 1.5:1 which confers with the ratio recommended as the adequate screening marker. (Renshaw AA *et al* 2009). The results of LSIL and HSIL also varied among different studies. The results of present study are comparable to that of (Manjit *et al* 2012) and (Nandwani *et al* 2016.). However some have reported a higher prevalence (Karuna *et al* 2003) and some lower. [TABLE 5]. No case of malignancy was reported in our case. The reason might be that gynaecologist in our institute prefer to send cervical biopsy over PAP smear in case of suspected malignant lesion.

CONCLUSION

In a developing country like India with limited resource and meagre health care facilities conventional PAP smear still proves to be a boon for screening pre invasive lesions of

cervix and preventing morbidity and mortality. This study recommends the vigilant and through screening of females especially after 40 years as the epithelial cell abnormality tend to occur more in this age group. Every women should be educated about importance of regular screening along with warning symptoms. They should be encouraged for timely gynaecological visit with Pap smear request.

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