RESEARCH ARTICLE

EPITHELIAL CELL ABNORMALITIES IN CERVICAL PAP SMEARS

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ABSTRACT

Background: Cervical cancer is the fourth most common cancer among women worldwide. In India it is the most common cancer among females. Papanicolaou cytological (Pap) test helps in detecting the early epithelial abnormalities in cervical cells.

Material and Methods: Pap smears of 1941 women attending the gynaecology OPD, from January 2012 to December 2015 were evaluated by light microscopy. The 2001 Bethesda system for reporting cervical cytology was used in evaluating the pap smears.

Results: The mean age was 41.7. The prevalence of epithelial cell abnormality was noted in 10.1% of the cases. Of which 16.7% were reported as inadequate, 73.2% as NILM, 3.8% as ASCUS, 4.0% as LSIL, 2.1% as HSIL and 0.2% as SCC.

Conclusion: Women aged 45 or above harbor the bulk of premalignant and malignant lesions in the Pap smear, signifying that these women are among the under users of cytological screening and hence regular counselling and screening should be conducted among vulnerable age groups.

INTRODUCTION

Cervical cancer is the fourth most common cancer in women, and the seventh overall, with an estimated 528,000 new cases in 2012. (Ferlay *et al*., 2013) The WHO estimated that each year over 1.3 lakh women are diagnosed with cervical cancer and over 74,000 die of cervical cancer in India. The cervical cancer burden in India was estimated approximately 1,00,000 in 2001. (Kodey and Narigapalli, 2013) The growing risk of cervical cancer in Indian women of age group 20-64 years is 24% compared to 1.3% for the world. (Kodey and Narigapalli, 2013) The high burden of cervical cancer in South and Southeast Asian countries is due to a high prevalence of HPV (more than 10% in women aged more than 30 years) and due to lack of screening. (Banik *et al.,* 2011) Cancer of cervix is readily preventable, by early detection and appropriate timely treatment of its precursor lesions by simple Papanicolaou (Pap) smears screening test. Pap smear is a simple, safe, non-invasive and effective method for detection of precancerous, cancerous and noncancerous changes in the cervix. A pap test can detect about 98% of cancer of cervix and 70% endometrial cancers. (Kodey and Narigapalli, 2013) Pap test detects cervical epithelial cell abnormalities which

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represent a spectrum of intraepithelial lesions, from mild to severe dysplasia to invasive cancer (Sankaranarayanan *et al.*, 2001) and facilitates early diagnosis.

Aim

The aim of the study was to know the prevalence of abnormal epithelial lesions in cervical cytology.

MATERIALS AND METHODS

This was a cross-sectional retrospective study done on 1941 women attending the gynaecology OPD at Government Medical College, Kolhapur from January 2012 to December 2015. The study was approved by institution ethics committee. The women were counselled about the procedure, informed consent was taken and clinical details were obtained from the records. Pap smears were collected as per conventional method and sent to pathology laboratory where the slides were stained with Pap stains and cytological abnormalities reported as per Modified Bethesda Classification, 2001.

RESULTS

The mean age was 41.7 years with range of 19-80 years. Majority of the cases with an abnormal Pap smears, belonged

to the 4th-6th decade of life. The Pap smears were adequate in 83.3%. Epithelial cell abnormality was noted in 10.1% of the cases. All other smears without epithelial cell abnormalities were grouped into Negative for Intraepithelial Lesion or Malignancy (NILM) category. The most frequent epithelial cell abnormality was LSIL in 4% followed by ASCUS 3.8%, HSIL 2.1%, and SCC 0.2% (Table 1).

Table 1. Distribution of cervical epithelial cell abnormalities according to age group

Age Groups	Inadequate	NILM	ASCUS	LSIL	HSIL	SCC	Total
15-25	18	103	1	0	1	0	123
26-35	97	510	9	10	4	1	631
36-45	99	508	36	19	8	1	671
46-55	35	184	10	21	7	0	257
56-65	48	91	9	21	13	2	184
>65	27	25	9	7	7	0	75
	324(16.7%)	1421(73.2%)	74(3.8%)	78(4.0%)	40(2.1%)	4(0.2%)	1941(100%)

NILM-Negative for Intraepithelial Lesion or Malignancy
ASCUS-Atypical Squamous Cell of Undetermined Significance
LSIL-Low Grade Squamous Intraepithelial Lesion
HSIL-High Grade Squamous Intraepithelial Lesion
SCC-Squamous Cell Carcinoma

Among those who underwent Pap testing, 18.2% cases were asymptomatic and the remaining 81.8% cases were symptomatic. White discharge was most common clinical presentation (29.4%) followed by prolapse, menorrhagia, PV bleed and abdominal pain. Cervical erosion was seen in 15.8% cases on per vaginal examination.

Table 2. Clinical presentation of women visiting Gynaecology OPD

Clinical Features	Frequency	Percentage (%)
No complaints	354	18.2
White discharge	570	29.4
Something coming out of vagina (prolapse)	274	14.1
Menorrhagia	120	6.2
Per vaginal (PV) bleed	107	5.5
Pain in abdomen	66	3.4
Dysmenorrhoea	21	1.1
Cervical growth	13	0.7
Burning micturition	13	0.7
Oligomenorrhoea	12	0.6
Cervical erosion	306	15.8
Other	83	4.3
Total	1941	100

History of Human Immunodeficiency Virus (HIV) was reported in 5.5% cases. 10.4% samples in HIV patients were inadequate. ASCUS (6.5%) and LSIL (6.5%) were most common abnormalities in these patients (Table 3). Cases with inadequate smears were advised regular follow up and repeat Pap smear after six months. As compared to non-HIV patients, epithelial cell abnormality was more common in HIV patients (Table 4).

Table 3. Pattern of epithelial cell abnormalities in HIV positive cases

Diagnosis	Frequency	Percentage (%)
Inadequate	11	10.4
NILM	78	72.9
ASCUS	7	6.5
LSIL	7	6.5
HSIL	3	2.8
SCC	1	0.9
Total	107	100

Table 4. Comparison of epithelial lesion between Non-HIV patients and HIV

Diagnosis	Non-HIV	HIV
NILM	73.2	72.9
ASCUS	3.8	6.5
LSIL	4.0	6.5
HSIL	2.1	2.8
SCC	0.2	0.9
Total	100	100

Table 5. Cervical Pap smear findings in HIV infected women in various studies

	Amphan et al (2011) (%)	Jha et al (2012) (%)	Chakravarty et al(2014) (%)	Kusumam et al (2016) (%)	Present Study (%)
NILM	84.6	87.89	74.33	88	72.9
ASCUS	2.8	3.19	1.6	1	6.5
LSIL	8.5	2.7	17.1	9	6.5
HSIL	3.5	1.47	5.3	-	2.8
SCC	-	-	1.6	2	0.9

Table 6. Comparison of epithelial lesions in Non-HIV and HIV cases in different study

|	Kusumam et al		Present study	
	Non-HIV	HIV	Non-HIV	HIV
Inadequate	-	-	16.7	10.4
NILM	98	88	73.2	72.9
ASCUS	1	1	3.8	6.5
LSIL	2	9	4.0	6.5
HSIL	-	-	2.1	2.8
SCC	-	2	0.2	0.9
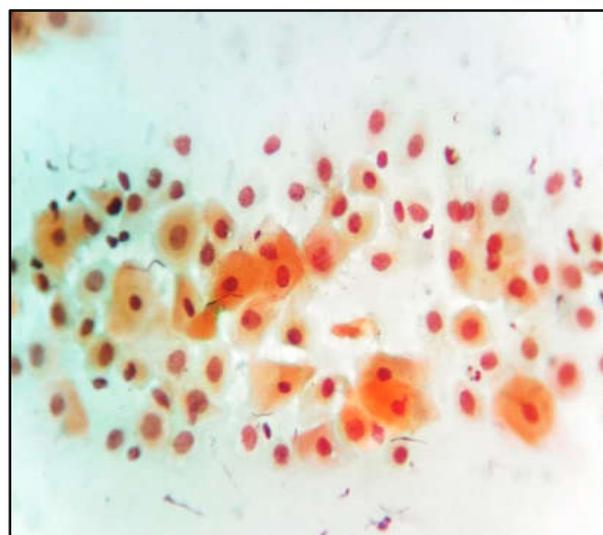
Fig.1. ASCUS mature cells with mild to moderate nucleomegaly and hyperchromasia
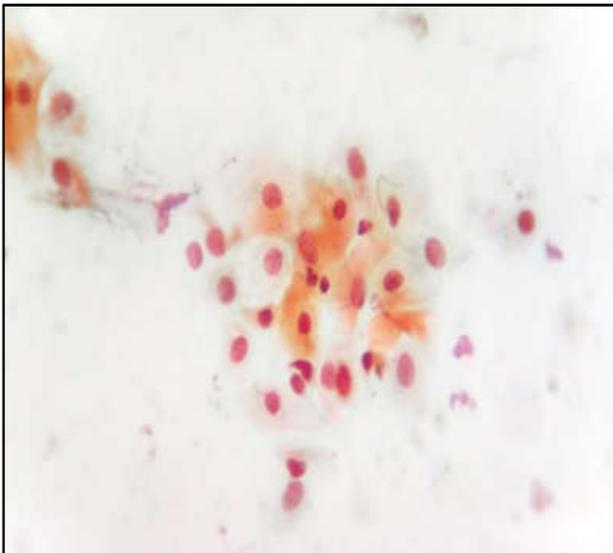
Fig.2. LSIL few cells in the centre showing perinuclear cytoplasmic clearing with nucleomegaly
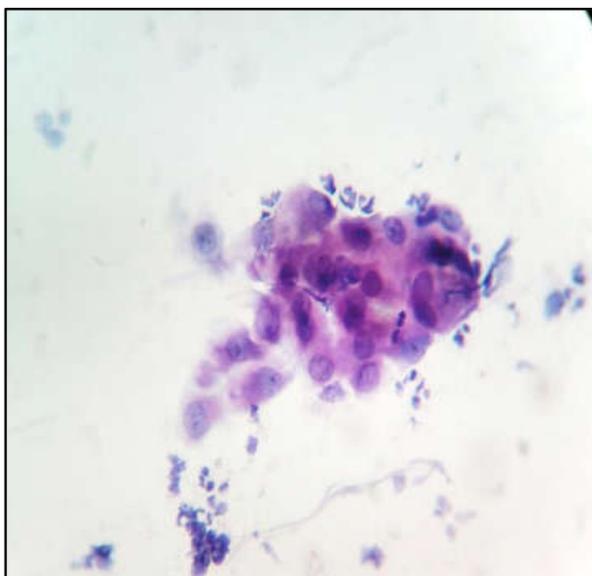
Fig.3. HSILparabasal cells with pleomorphic nuclei and coarse clumped chromatin

DISCUSSION

The incidence of cervical malignancy is very high In India, especially in rural areas. (Nandakumar *et al.,* 1995) Age-standardized incidence rates have ranged from 16-55 per 100,000 women in different regions of India. (Sankaranarayanan *et al.,* 2003) India has a national programme for cancer since 1975, when the emphasis was on equipping premiere cancer institutions. In 2010, cancer control became a part of a more comprehensive, larger program on non-communicable diseases called National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Disease and Stroke (NPCDCS). Molecular studies have shown that HPV-16 and 18 are the two most common highly oncogenic types found in invasive cervical cancer. (Aswathy *et al.,* 2015) The long interval between initial infection and disease indicates that there are other factors involved, such as sexual habits, reproductive factors, other sexually transmitted diseases, co-infection with HIV, smoking, nutritional deficiency, genetic susceptibility, use of hormonal

contraceptives, and high parity. (Aswathy *et al.,* 2015) Khamankar *et al.* (2014) reported increasing parity significantly and independently increases risk of cervical neoplasm. Cervical cytology screening by Pap smear is a simple, safe, quick and effective test to identify cervical intraepithelial neoplasia (CIN) and carcinoma of cervix at an early stage; thereby helps the gynecologists in early and more efficient management of the patients. A study from Bangladesh (Sankaranarayanan *et al.,* 2001) showed a higher prevalence (8.2%) of epithelial cell abnormality in the Pap smear in contrast to other studies (Kapila *et al.,* 2006; Abdullah, 2007). The authors of this study attributed this high prevalence to the fact that the patients included in the study visited the tertiary care hospital for specific gynaecological complaints. Studies from the different regions of India reported epithelial abnormalities ranging from 1.9% to 6.9%. (Tailor *et al.,* 2016; Rana *et al.,* 2013; Nair *et al.,* 2016) In our study the prevalence of epithelial cell abnormality was 10.1 % which is similar to the study done by Banik *et al.* (2011). The variation in prevalence of epithelial abnormalities can be attributed to varied geographical distribution, lifestyle and cultural habits.

Edelman *et al.* (1999) studied Pap smears from 29295 females over a period of one year and the Pap smear abnormalities were as follows: 9.9% ASCUS, 2.5% LSIL, 0.6% HSIL, and 0.2% invasive cancer. They also showed that adolescents with an age group of 13-22 years had a significantly higher rate of LSIL. Another study by Kapila *et al.* (2006), where 1822441 Pap smears were examined over a period of five years, showed that low-grade lesions were common among women in the age group of 15-30 years, while high-grade lesions were frequently encountered among women in the age group of 25-45 years. Patients older than 40 years had the greatest incidence of invasive cancer. An Indian study conducted by Gupta *et al.* (2010) reported epithelial abnormalities in 5.64%. Abnormal cervical cytology lesions such as ASCUS, HSIL, LSIL, carcinoma and AGUS represented 3.36%, 1%, 0.34%, 0.41% and 0.13%, respectively. On the other hand, another Indian study conducted on urban hospital cases reported a much lower prevalence of epithelial abnormalities, ie, 1.39%. ASCUS, LSIL, HSIL and SCC represented 0.64%, 0.216%, 0.16% and 0.07%, respectively. (Mulay *et al.,* 2009) This may be explained by the different conditions prevalent in each study, with less prevalence in the urban studies as they may represent situations of good screening programmes and also the hygienic conditions. In our study, 16.7% were reported as inadequate, 73.2% as NILM, 3.8% as ASCUS, 4% as LSIL, 2.1% as HSIL and 0.2% as SCC. The most frequent epithelial cell abnormality in our study was LSIL, which is quite higher than the study done by Edelman *et al.* (2009) The low grade lesions were common among women in the age group of 36-55 years which is in contrast to the study done by Kapila *et al* (2006). The incidences of epithelial cell abnormalities in various studies on HIV infected females are given in Table 5. Comparison between Non-HIV and HIV cases is given in Table 6. From Table 5 and 6, it is evident that cervical epithelial abnormalities are more common in HIV infected patients.

Our study showed a higher incidence which indicates the need and importance of cervical screening. It also directs and gives us the scope to conduct further studies regarding the early detection of cervical cancers. The Pap smear as a screening tool has great importance and is widely used routine test which enables proper management at an early stage by detecting the

early cervical changes. Though cervical cancer is said to be more common in rural population, we have noted a fairly high incidence of cervical epithelial abnormality in an educated population living in an urban area.

Conclusion

Regular counselling and screening with cervical PAP smear should be conducted amongst vulnerable age groups. HIV positive cases should also be screened at regular intervals because of comparatively higher prevalence of epithelial lesions. This can be achieved by various awareness programmes in co-operation with media, nongovernment organizations, and government. An effective and efficient multidisciplinary approach can assist in careful planning for successful outcome in this cancer which can be detected at an early stage.

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