Original Article

Indian Journal of Pathology: Research and Practice
Volume 6 Number 1, January - March 2017
DOI: http://dx.doi.org/10.21088/ijprp.2278.148X.6117.3

Analysis of Cervical Pap Smears and Its Utilty in Screening for Premalignant Lesions in a Tertiary Care Instituition

Usha M.*, Sharon Reginald, Sharath Soman**, Rakshitha H.B.**, Avnika Jasuja**, Aneesha Asok****

*Assistant Professor, **Post Graduate, Department of Pathology, M.S. Ramaiah Medical College, MSRIT post, Bangalore, Karnataka, India.

Abstract

Introduction: Cervical cancer is the leading cause of mortality and morbidity among women with nearly four lakh new cases diagnosed annually worldwide, of which 80 % cases are in developing nations. Cervical Pap smear is a sensitive test for early screening of cervical lesions. *Materials and Methods:* A two year retrospective study of pap smears was conducted in the Department of Pathology from December 2013 – December 2015. A total of 5,464 pap smears were studied from patients in the age group of 17 -80 years. Conventional pap smears were prepared according to standard procedures and were reported according to 2014 Bethesda system. *Result:* Out of 5,464 patients screened, 5,158(94.39 %) cases were benign, 157 (2.87%) were pre-malignant, 8 (0.14%) were malignant and 141 (2.58%) were unsatisfactory. The pre-malignant lesions were highest between 41-50 years and malignant cases between 51-60 years. *Conclusion:* Pap smear screening for cervical cancer is a highly effective tool for early detection of cervical premalignant lesions to prevent their progression to overt malignancy. Pap smear screening must be made mandatory after 30 years of age.

Keywords: Pap Smear; Screening; Intraepithelial Malignant Lesions.

Introduction

Cervical cancer is a global health problem and a leading cause of mortality and morbidity among women worldwide. There are 4, 00,000 new cases diagnosed annually worldwide with 80% of these cases occurring in developing nations [1]. Every year in India, around 1, 22,800 women are diagnosed with cervical cancer and 67,477 die from the disease. [2]Cervical cancer is the second most common cancer in women aged 15-44 years [2,3].

Cervical cancer is largely preventable by early detection and appropriate timely intervention by means of Pap smear screening [4]. The overall sensitivity in detection of high grade Squamous intra epithelial lesion (HSIL) in pap smears is 70-80% [5]. If pap screening is associated with concurrent Human Papilloma Virus (HPV) testing, the overall sensitivity is increased [6].

Corresponding Author: Usha M., 150, 9thcross, 3rd main, HIG colony, RMV II stage, Bangalore- 560094, Karnataka, India.
E-mail: usharavihitha@gmail.com

(Received on 18.10.2016, **Accepted on** 31.10.2016)

The pap screening in India is mostly institution based and currently no mass screening program exists [3,4]. Indian women usually present to clinics only when symptomatic; common complaints being pain, discharge or abnormal bleeding per vaginum [6]. The Bethesda system for reporting cervical cytology is the most widely used reliable method for describing Pap smear results, with its latest revision in 2014 [7,8].

The aim of the study is to analyze the different spectra of cervical Pap smear cytology in our institution for a period of two years and to categorize the different premalignant, malignant and benign lesions, with respect to age distribution.

Materials and Methods

All patients who had presented to the Obstetrics & Gynaecology department for various complaints and who had consented for Pap screening test were included in the present study. Brief history, presenting complaints, parity and last menstrual period were recorded wherever relevant. The patients were

examined and cervical smears were obtained by trained gynaecologists, using disposable modified Ayres spatula and Cyto brush. The modified Ayres spatula was inserted into the cervix and rotated in a 360 degree angle to obtain material from ectocervix. The cytobrush was inserted subsequently to sample the endocervix. Material obtained from both instruments were immediately smeared onto separate clean glass slides, labelled and fixed in 95% ethyl alcohol. The prepared slides were then stained by Papanicolau stain, cleared and mounted in DPX (distrene dibutyl phtalate xylene) medium.

The mounted slides were then examined by two cytopathologists under light microscope. Smears were reported using 2014 Bethesda system of cervical cytology reporting.

Results

Total of 5,464 cervicovaginal Pap smears were studied from patients between ages of 17 to 80 years from a two year period (December 2013 to December 2015). Most common clinical manifestation was discharge per vagina [Table 1]. Majority of the patients were from the age group of 31-40 years followed by 41-50 years [Table 2].

Cytological findings broadly classified into unsatisfactory smears, benign, premalignant and malignant categories. There were 94. 39% benign Pap smears (benign cellular changes of inflammation), 2. 87% of premalignant cases, 0.14% of malignant cases and 2.58% are unsatisfactory or inadequate samples [Table 3].

According to Bethesda system, benign smears were further classified as Negative for intraepithelial lesion or malignancy (NILM), NILM/Inflammatory and atrophic smear. Out of 5464 cases studied, 1961 cases were NILM (35.8%), 2811 Cases were NILM/ inflammatory (51. 44%) and 386 cases were atrophic (7.06%) [Table 4].

There were 141 cases (2.58 %) which were found to be unsatisfactory due to low cellularity or due to hemorrhage or dense inflammatory infiltrate obscuring the cells completely. Low grade Squamous intraepithelial lesion [LSIL] was found to be highest in the 41-50 years age group, HSIL was highest in 51-60 years age group. Atypical Squamous cells of undertermined significance [ASCUS] and Atypical Glandular Cells-NOS were found to be highest in 41-50 age groups. Atypical Squamous cells cannot exclude HSIL [ASC-H] had highest incidence in 51-60 age groups. Squamous cell carcinoma was found to be highest in 51-60 years age group [Table 5].

Table 1: Clinical presentation

Clinical presentation	Number	Percentage
Pain abdomen	367	6. 71%
Bleeding per vagina	223	4.08%
Discharge per vagina	3547	64.91%
Itching/burning sensation	403	7.37%
Mass per vagina/prolapsed	217	3.97%
Routine screening	707	12.93%

Table 2: Age distribution

Age group [years]	Number of cases	Percentage [%]
<30	1015	18.57
31-40	1914	35%
41-50	1438	26.31
51-60	587	10. 74
61-70	398	7.28
71-80	112	2.04
Total	5464	100

Table 3: Spectrum of pap lesions

Pap Lesions	Number	Percentage (%)
Benign	5158	94.39
Pre-malignant	157	2.87
Malignant	8	0.14
Unsatisfactory	141	2.58

Table 4: Benign cervical epithelial lesions

Benign cervical epithelial lesions	Number	Percentage (%)
NILM	1961	35.8
NILM, non specific inflammation	2484	40.2
NILM, Candida	107	3.84
NILM, Bacterial vaginosis	119	4.27
NILM, Trichimonas vaginalis	34	1.2
NILM, mixed infection	39	1.4
Atrophy	386	7.06
Polypoidal endocervicitis	28	7.82

Table 5: Premaligant and malignant cervical lesions

Premalignant and malignant lesions	Number	Percentage (%)	Age group lesion commonly seen
ASCUS	34	0.62	41-50 years
ASC-H	6	0.10	51-60 years
AGUS	8	0.14	41-50 years
LSIL	80	1.46	41-50 years
HSIL	29	0.53	51-60 years
SCC	8	0.14	51-60 years

Table 6: Comparison of cervical lesion incidence with other studies

Ref no	Study place	Authors	Study duration	Sample size	ASCUS	LSIL	HSIL	Invasive carcinoma	AGUS
23	USA	Daney DD et al (2000)	not mentioned	2000	4.5%	1.6%	0.5%		0.3%
24	South Africa	Fonn S etal (2002)	not mentioned	20.603	2.42%	1.8%	0.4%	-	-
25	Saudi Arabia	Jamal A et al (2003)	1984-2000	22,089	-	-	-	-	2.57%
26	Israel	Sadan O et al (2004)	1991-1999	297, 849	-	0.69%	0.29%	-	-
27	Turkey	Tuncer ZS et al (2005)	2002-2003	4322	0.6%	0.4%	-	-	-
28	Saudi Arabia	Altaf FJ(2006)	1990-2004	2132	2.4%	0.6%	0.4%	-	1.1%
29	America	Nance KV et al(2007)	1995-2004	310,080	-	-	0.28-0-5%	-	-
30	Mauritius	Mulay Kaustuab et al (2009)	2003-2004	10,000	0.26%	0.07%	0.08%	0.01%	0.05%
1	India	Patel MM etal (2011)	2006-2007	5.5%	4.12%	0.1%	0.1%	-	0.5%
31	India	Bal etal (2012)	Not mentioned	300	0.3%	2. 7%	0. 7%	1%	-
16	India	Kothari S et al (2014)	1998-2010	36, 740	0.11%	0.83%	0.3%	0.31%	0.05%
	India	Present study	2013-2015	5464	0.62%	1.46%	0.53%	0.14%	0.14%

Discussion

Based on the data of the Population Based Cancer Registries (PBCRs) of India the estimated number of new cervical cancers during 2007 in India was 90.708. The relative five year survival reported averaged 48.7 % [9]. Aetiologic 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 papillomavirus (HPV), human immunodeficiency virus (HIV) in cervical carcinogenesis and other factors like smoking, diet, oral contraceptives, hormones, etc. The accumulated evidence suggests that cervical cancer is preventable and is highly suitable for primary prevention. Sexual hygiene, use of barrier contraceptives and ritual circumcision can undoubtedly reduce cervical cancer incidence. Education, cervical cancer screening of high risk groups and improvement in socio-economic status can reduce cervical cancer morbidity and mortality significantly. Pap smears play a vital role in screening cervical cancers. Regular screening of appropriate women for cervical cancer with the Pap test reduces mortality from cervical cancer [10]. The Pap test is indicated to screen for malignant and premalignant lesions of the cervix. The recommended age at initiation of cervical cancer screening has undergone significant revision over time as the natural history of HPV infection and subsequent cervical dysplasia has been

elucidated. Although former guidelines recommended starting Pap smear screening at age 18 or at the onset of sexual activity, these guidelines were revised in 2006 to recommend initiation 3 years after the onset of sexual activity or age 21, whichever comes first. In 2009, these were further revised to recommend that cervical cancer screening begin at age 21, regardless of sexual history. This recommendation was confirmed in 2012 and again in January 2016 [11].

The present study had patients with a mean age of 43.3 years who had abnormal pap smears which is comparable to Tailor HJ et al in their study [2]. Most of our patients presented with vaginal discharge which is comparable with many other studies [12,13]. As many studies have confirmed that vaginal discharge is the most commonest sign, creating an awareness for getting Pap smear testing will help in detecting the lesions earlier. Community health awareness campaigns and large scale Pap screening program for women should be undertaken.

In our study, the commonest pre-malignant lesion detected was LSIL(1.46%), followed by HSIL(0.53%), ASCUS (0.62%), AGUS (0.14%) and ASC-H (0.10%). These results are comparable to some studies of Indian and other population [8,10,14-16]. Some studies show higher incidence of ASCUS [17-20]. Higher incidence of ASCUS when compared to LSIL may be attributable to cross section of population, education and awareness, socio-economic disparity and earlier presentation. A more detailed analysis showed that the biggest difference in the various studies is recorded in the ASCUS and LSIL group where the prevalence ranged from 0.6% to 4.5%. This could be due to a subjective difference, where minor changes are probably not recorded because ASCUS had an overall low prevalence in the studies. It is interesting that in the majority of the studies, including ours, HSIL formed less than 1% of the abnormal smears. Studies in a high-risk population in Zimbabwe and China with a high incidence of cervical cancer are those which have reported rates of HSIL as high as 3.7% [17-21].

Cervical lesions incidence in pap smears are compared in Table 6.

In the present study, the highest incidence of premalignant lesions picked up by cervical pap screening was in the 41-50 age group. Our results were similar to that of Mishra JS et al 2004 [4] study, where incidence of premalignant lesions were highest in women between 41 and 50 years of age. The highest incidence of squamous cell carcinoma were in women between 51-60 years of age, which was comparable to other studies [3,6,22]. Hence, Pap smear screening becomes more important before the age of 40years where premalignant lesions are more common and can prevent progression to carcinoma.

Conclusion

Cervical cancer is a preventable disease which is preceded by pre-malignant lesions taking upto 5-15 years to transform into invasive cancer. Pre-malignant lesions have nearly 100% successful cure rate, whereas, advanced cancer has less than 35%survival rate [6]. Pap smear testing is the most feasible and affordable mode for control of carcinoma cervix in developing countries like India, should be carried out in all women of high parity irrespective of age (with three or more children) and in older women above the age of 40 years irrespective of parity. 2012 ASCCP Consensus Guidelines recommends for those whose pap smears show abnormal cytology should get HPV co-testing and for LSIL and HSIL coloposcopy along with HPV co-testing as a part of further management which would probably reduce mortality associated with cervical cancers. Larger studies are necessary to estimate true pattern of cervical pap abnormalities along with detection of common HPV strains in Indian population, as part of future targeted therapy.

References

1. Patel MM, Pandya AN. Cervical pap smear study and its utility in cancer screening, to specify the strategy for cervical cancer control. National journal of community medicine. 2011; 2:28-32.
2. Tailor HJ, Patel RD, Patel PR, Bhagat VM. Study of cervical Pap smear in a tertiary care hospital of south Gujarat, India. International Journal of Research in Medical Sciences. 2016; 4:286-8.
3. Thirumugan P, Premila E. Study of early detection of cervical cancer by Pap smear in selected setting of Puducherry. Asia Pacific Journal of Research in Medical Sciences. 2015; 1:416-8.
4. Misra JS, Srivatsava S, Singh U, Srivatsava AN. Risk-factors and strategies for control of carcinoma cervix in India: Hospital based cytological screening experience of 35 years. Indian journal of cancer. 2009; 46:155-9.
5. Maryem A, Ghazala M, Arif HA, Tamkin K. Smear Pattern and Spectrum of Premalignant and Malignant Cervical Epithelial Lesions in Postmenopausal Indian Women: A Hospital Based Study. Diagnostic Cytopathology. 2011; 40:976-83.
6. Patel MM, Pandya AN, Modi J. Cervical Pap smear study and its utility in cancer screening, to specify the strategy for cervical cancer control. National

Journal of Community Medicine. 2011; 2:56-9.

7. Juneja A, Sehgal A, Sharma S, Pandey A. Cervical cancer screening in India: Strategies revisited. Indian J Med Sci. 2007; 61:34-47.
8. Dinshaw KA, Shastri SS. Screening for cervical cancer in India. Natl Med J India. 2001; 14:1-3.
9. Nandakumar A, Ramnath T, Chaturvedi M. The magnitude of cancer cervix in India. Indian J Med Res. 2009; 130:219-21.
10. Moyer VA, U.S. Preventive Services Task Force. Screening for cervical cancer: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2012; 156:880-91.
11. American College of Obstetricians and Gynecologists. Cervical cancer screening and prevention. Practice Bulletin No. 157. *Obstet Gynecol*. 2016; 127:e1-20.
12. Pradhan B, Pradhan SB, Mital VP. Correlation of Pap smear findings with clinical findings and cervical biopsy. Kathmandu University Medical Journal. 2007; 5:461-7.
13. Ranabhat SK, Shrestha R, Tiwari M. Analysis of abnormal epithelial lesions in cervical Pap smears in Mid-Western Nepal. Journal of Pathology of Nepal. 2011; 1:30-3.
14. Magdy HB, Mohammed SM, Naema G, Souad O. Cytological pattern of cervical Papanicolaou smear in eastern region of Saudi Arabia. J Cytol. 2011; 28: 173–7.
15. Bamanikar, Sunita A, Chandanwale Shirish S, Baravkar Dadaso S, Dapkekar Prachet. Study of Cervical Pap Smears in a Tertiary Hospital. Indian Medical Gazette. 2014; 148:250-4.
16. Kothari S, Gohel A, Dayal A, Shah R, Patel S. Pap smear - A tool for detection of cervical intraepithelial lesions in health check up schemes: A study of 36,740 cases. Int J Res Med. 2014; 3:12-5.
17. Tuncer ZS, Basaran M, Sezgin Y, Firat P, Mocan Kuzey G. Clinical results of a split sample liquid based cytology (Thin Prep) study of 4,322 patients in a Turkish institution. Eur J Gynaecol Oncol. 2005; 26:646-8.
18. Wasti S, Ahmed W, Jafri A, Khan B, Sohail R, Hassan S. Analysis of cervical smears in a Muslim population. Ann Saudi Med. 2004; 24:189-92.
19. Sadan O, Schejter E, Ginath S, Bachar R, Boaz M, Menczer J, et al . Premalignant lesions of the uterine cervix in a large cohort of Israeli Jewish women. Arch Gynecol Obstet. 2004; 269:188-91.
20. Jamal A, Al-Maghrabi JA. Profile of Pap smear cytology in Western region of Saudi Arabia. Saudi Med J. 2003; 24:1225-9.
21. Tbistle PJ, Chirenje ZM. Cervical cancer screening in a rural population of Zimbabwe. Cent Afr J Med. 1997; 43:246-51.
22. Nayar R, Wilbur D. The Bethesda system for reporting cervical cytology, 3rd edition, 2015, Springer books.