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Spectrum of Cervical PAP Smear in Tertiary Care Center

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Abstract: ***Background: In India cervical cancer is the leading cause of morbidity and mortality. Cancer of cervix is preventable, and can be diagnosed at the pre - malignant/pre - invasive stage with adequate and repetitive cytological screening by Papanicolaou (Pap) smears. Aim: The aim of the study is to evaluate the use of the Pap smear screening method for detection of precancerous lesions. Methods: All women who visited the outpatient gynecology clinic at civil hospital, Ahmedabad, from December 2019 to April 2020 for different clinical problems were recruited for the study. A total of 350 women who were sexually active and over 21 years of age were enrolled in the study. A clinical examination, an examination per speculum, and a vaginal examination were performed and a history taken for all women. A Pap smear was used for all women to screen for cervical cancer. The smear was obtained using an Ayrespatula and sent to the Pathology department. The Pap smear were reported by adopting "The revised Bethesda System for reporting cervical cytology (2014 TBS)". Results: A total of350samples were enrolled in the study. Out of 350 samples, 9 samples were unsatisfactory. Out of 341 samples which were satisfactory for evaluation14.2% (50 cases) were of NILM, 70.9 % (248 cases) were inflammatory, most of the smears showed non - specific inflammation which accounts for 61.4% (152 cases), followed by Bacterial vaginosis - 18.2% (45 cases), Trichomonas vaginalis - 8.4% (21 cases), Candida species - 6.7% (17 cases), Atrophic vaginitis - 5.3% (13 cases).12.3 % (43 cases) were of ECA. Amongst ECA, 6% cases were of ASCUS - most common age group is 30 - 39 years. 3.4% cases were of LSIL, 2% cases were of HSIL, 0.6% cases were of AGUS and 0.3% cases were of SCC. It was found that the most common clinical presentation was white and foul smelling discharge per vagina followed by uterine prolapse, cervical erosion, cervical growth and irregular vaginal bleeding. Conclusion: The most widely accepted screening method for cervical malignancy is Pap smear examination especially in developing countries like India. Pap smears can be used to diagnose inflammatory, premalignant and malignant lesions. All suspicious lesions on Pap smear should be followed by repeat Pap smear examination, colposcopy and cervical biopsy.***

Keywords: Pap smear, cervical cytology

1. Introduction

Cancer of the cervix is a global health problem and it is a leading cause of mortality and morbidity among women worldwide. Cervical cancer is the second most common cancer in women aged 15 - 44 years.[1]

Cervical cancer is the most common cause of cancer related deaths among women in developing countries. Mortality due to cervical cancer is also an indicator of health inequalities, as 86% of all deaths due to cervical cancer are in developing countries, low and middle income countries. Every year in India, 122, 844 women are diagnosed with cervical cancer and 67, 477 die from the disease.[2]

Cancer of cervix is readily preventable, by early detection and appropriate timely treatment of its precursor lesions by simple Pap screening test. But, women usually present to the clinic only when they have symptoms, such as pain, discharge, and/or abnormalbleeding.[3]

Cervical cancer tends to occur in middle age. It is rare in women under 20 years of age and most common in women over 40 years. Most number of deaths usually occurs in women in their fifth and sixth decade of life.[4]

Poor living conditions, lack of hygiene, early age of first intercourse, multiple sexual partners, and human papilloma virus (HPV) infections are major risk factors for the development of cervical carcinoma.[5]

Epidemiological studies suggest that HPV is associated with a 10 - fold or greater risk of cervical neoplasia than controls.[6]

It is now known that certain strains (16 and 18) of HPV are present in most cervical cancers, several newer strains as etiological factor are under investigation.7

Papanicolaou (Pap) - stained cervical cytology smears also detect the presence of genital infections by various organisms such as trichomonas vaginalis, candida species, actinomycetes, bacterial vaginosis, neisseria gonorrhoeae, herpes simplex virus (HSV), and HPV. [8]

Cervical dysplasia and invasive cervical cancer can be diagnosed by detection of epithelial cell abnormality (ECA) in a cervical scrapping from a clinically suspicious woman by means of cervical cytology study popularly known as Pap test.[9]

Pap test detects early cervical epithelial cell abnormalities and mild to severe dysplasia to invasive cancer and facilitates earlydiagnosis.[10]

This test not only plays a crucial role in the detection of cervical cancer and its precursor lesions but also aids in the diagnosis of other conditions as well such as infective and inflammatory conditions.[11]

India has a national programme for cancer since 1975, when the emphasis was on equipping premier cancer institutions. In 2010, cancer control became a part of a more comprehensive, large programme on non - communicable disease called National Programme for Prevention and Control ofCancer.1[2]

2. Materials and Method

The prospective study was carried out at Government Medical College and Civil hospital, Ahmedabad, Gujarat, India during December 2019 to April 2020, total 350 patients were screened. The patients were in the age range of 20 - 59 years, having complaints like vaginal discharge, bleeding per vagina or something coming out per vagina, post - coital bleeding, inter menstrual bleeding, and pain in lower abdomen. History and symptoms along with parity were recorded. Smears were taken by trained technician using modified Ayres wooden spatula which was inserted and rotated 360° over cervix. Both ectocervix and endocervix were sampled. The cellular material obtained on the spatula and cyto - brush was quickly smeared on a clean glass slide, labeled, fixed in 95%ethyl alcohol immediately and subsequently stained by Pap stain. After staining, slides were mounted with DPX (Distrene dibutyl phthalate xylene), screened and reported by cytopathologist under light microscope according to the "The revised Bethesda System for reporting cervical cytology (2014 TBS)".

3. Results

The prospective study was carried out for total 350 cases and were analysed according to clinical presentation of patients, incidence of various cytological abnormalities according to age group, incidence of epithelial cell abnormalities (ECA), categorization of inflammatory smears and comparison of lesions with different studies.

Table 1: Clinical presentation of patients

Clinical presentation	No. of patients	Percentage (%)
White Discharge	240	69
Foul smelling dirty discharge	35	10
Irregular vaginal bleeding	5	1.5
Cervical erosion	22	6
Uterine Prolapse	26	7.5
Cervical growth	22	6
Total	**350**	**100**

Table 1 has depicted the clinical presentation of the patients. It was found that the most common clinical presentation was white and foul - smelling discharge per vagina followed by uterine prolapse, cervical erosion, cervical growth and irregular vaginal bleeding.

Table 2: Results of Cervical Cytology/ Pap test

Results of Pap test	No. of cases	Percentage (%)
Inadequate	9	2.6
NILM	50	14.2
Inflammatory	248	70.9
ECA	43	12.3
Total	350	100

Table 2 show results of Cervical Cytology/ Pap test. Out of 350 samples, 9 samples were unsatisfactory smears due to inadequate cellularity and hemorrhagic obscuring the cellular element; hence they were discarded from the study.14.2% (50cases) were of NILM, 70.9 % (248 cases) were of inflammatory, 12.3% (43 cases) were of ECA.

Table 3: Results of Cervical Cytology/ Pap test according to the age group

Age group	Inadequate	NILM	Inflammatory	ASCUS	LSIL	HSIL	AGUS	SCC
20 - 29	5	26	71	4	0	0	0	0
30 - 39	2	12	104	12	3	1	0	0
40 - 49	1	7	39	3	6	2	1	0
50 - 59	1	5	34	2	3	4	1	1
Total	9	50	248	21	12	7	2	1
Percentage (%)	2.6	14.2	70.9	6	3.4	2	0.6	0.3

Table 3 show results of cervical cytology/Pap test according to Age group. Most common age group affected by inflammatory category is 30 - 39 years. Where as in ECA category - most common age group affected by ASCUS is 30 - 39 years., commonly affected age group by LSIL is 40 - 49 years, commonly affected age group by HSIL is50 - 59 years, commonly affected age groups by AGUS is 40 - 49 years followed by 50 - 59 years and commonly affected age group by SCC is 50 - 59 years.

Table 4: Categorization of inflammatory smear

Inflammatory changes	No. of cases	Percentage (%)
Nonspecific Inflammation	152	61.4
Atrophic vaginitis	13	5.3
Trichomonas vaginalis	21	8.4
Candida species	17	6.7
Bacterial vaginosis	45	18.2
Total	248	100

Table 4 show Categorization of inflammatory smear. Most of the smear showed nonspecific inflammation which accounts for 61.4% (152 cases), followed by Bacterial vaginosis which accounts for 18.2% (45 cases), Trichomonas vaginal is which accounts for 8.4% (21 cases), Candida species which accounts for 6.7% (17 cases) and Atrophic vaginitis which accounts for 5.3% (13 cases).

Table 5: Grading of ECA

Results of ECA	Total	Percentage (%)
ASCUS	21	48.8
LSIL	12	28
HSIL	7	16.3
AGUS	2	4.6
SCC	1	2.3
Total	43	100

Table 5 show Grading of ECA.12.3% (43 cases) smears were of ECA in which 48.8% (21 cases) were of ASCUS, 28% (12 cases) were of LSIL, 16.3% (7 cases) were of HSIL, 4.6% (2 cases) were of AGUS and 2.3% (1 case) were of SCC.

Table 6: Summary of Cyto - diagnosis of total (n=350) cases

Cytodiagnosis		No. of cases	Percentage (%)
Inadequate		9	2.6
NILM		50	14.3
Inflammatory (n=248) (70.9%)	Nonspecific Inflammation	152	43.42
	Atrophic vaginitis	13	3.71
	Trichomonas vaginalis (TV)	21	6
	Candida sp.	17	4.85
	Bacterial vaginosis	45	12.8
ECA (n=43) (12.3%)	ASCUS	21	6
	LSIL	12	3.4
	HSIL	7	2
	AGUS	2	0.6
	SCC	1	0.3
Total		350	100

4. Discussion

With the changes in the life styles and demographic profiles in developing countries, non – communicable diseases are emerging as an important health problem which demand appropriate control program before they assume epidemic propagation. Cancer has been a major cause of morbidity and mortality. Cervical cancer behaves like a sexually transmitted disease epidemiologically. The incidence of cervical cancer is more common in women who have multiple sexualpartners[13], or whose partners are promiscuous[14] and is rare in virgins. HPV plays an important role in carcinogenesis and the presence of other risk factors along with HPV infection are important in deciding the outcome of the disease i.e. whether HPV infection will regress or progress to cervical cancers.[15]

The various screening methods have decreased the incidence of cervical malignancy in the past 30 years. WHO recommends screening at 45 years of age as the most reliable approach because it would detect 20% of total cervical malignancies.[16] To prevent cervical malignancies, Pap smear examination is advocated in all women of 21 years of age.[17] As Pap smear examination is most efficient of all methods, it is regarded as gold standard screening method.[18]

The prospective study was carried out at Government Medical College and Civil hospital, Ahmedabad, Gujarat, India during December 2019 to April 2020, total 350 patients were screened. The patients were in the age range of 20 - 59 years having various Gynecological symptoms. The aim of the study is to evaluate the use of the Pap smear screening method for detection of precancerous lesions.

Leucorrhoea was the most common presentation in our study. This is similar to the study done by Shantietal.[19]

The most common cytological diagnosis in this study was inflammatory smear with peak in 20– 40 years. This preponderance could be explained as most of the infections are sexually transmitted.

ASCUS was the most common epithelial abnormality followed by LSIL. The epithelial abnormalities were most commonly seen between 40 – 49 years. 80% of all abnormal epithelial lesions were found above 40 years in a study by Ranabhat SK et al.

Inflammatory and benign lesions accounted to 70.9% and premalignant and malignant lesions to 12.3%.

Studies done by Mandakini et al, Ranabhat et al, Bhojani et al, Saniatanveer et al, Sabina et al and Neelima et al all showed predominantly inflammatory and benign lesions while premalignant and malignant lesions accounted to <10%. The comparison with various studies is depicted in table 7.

Table 7: Comparison of lesions with other studies

Study series	Inflammatory and benign lesions	Premalignant and malignant lesions
Mandakini et al (n - 995)	940 (94.5%)	55 (5.5%)
Bhojani et al (n - 400)	363 (90.75%)	37 (9.25%)
SaniaTanveer et al (n - 300)	288 (96%)	12 (4%)
Sabina et al (n - 500)	490 (98.3%)	10 (1.7%)
Neelima et al (n - 221)	200 (90.5%)	21 (9.5%)
Present study	**248 (70.9%)**	**43 (12.3%)**

ASCUS should be diagnosed as it can progress to LSIL, HSIL or SCC.[20 - 23] In the present study incidence of HSIL increased with age. Squamous cell carcinoma accounts for 0.3% in the present study. In the study done by Misra et al squamous intraepithelial lesion was found in7.2% and carcinoma in 0.6% of cases.[24]

In the present study the diagnosis of ASCUS was detected in the age group 30 - 39 years. Hence, the screening Pap smear examination should start at an earlier age. It is proposed by American society that all women should begin screening for cervical malignancy after 3 years of first sexual intercourse and recommended that women who are above 30 years should be screened for every 1 - 2 years and screened after 2 - 3 years if three consecutive pap smears are normal.[25]

The comparison of squamous cell abnormalities with various studies is depicted in table 8.

Table 8: Comparison Study of Squamous Cell Abnormalities

Name of study	Total number of subjects	LSIL (%)	HSIL (%)	ASCUS (%)	SCC (%)
George and Rao [18]	1000	2.0	0.9	0.3	0.3
Sarma et al. [19]	242	3.53	3.53	1.32	3.53
Gupta et al. [20]	4703	1.36	0.91	0.52	0.28
Nayani and Hendre [21]	104	0.5	0.1	1.7	-
Sengul et al. [22]	1032	0.39	1 (0.1)	1.18	0.02
Kothari et al. [23]	36740	0.83	0.31	0.11	0.05
Nair et al. [24]	2028	1.58	0.49	0.15	0.2
Bal et al. [25]	300	2.7	0.7	0.3	1.3
Padmini et al. [26]	100	5.0	3.0	8.0	1
Shaki, *et al*. [27]	1100	75 (6.8)	74 (6)	45 (4)	26 (2.3)
Thomas et al. [28]	85	14.12	5.88	15.3	-
Karuma et al. [29]	100	7	5	6	-
Present study	350	3.4	2	6	0.3

5. Conclusion

The most widely accepted screening method for cervical malignancy is Pap smear examination especially in developing countries like India. Hence screening programme like pap cytology that is easily available and cost effective should be formulated. Pap smears can be used to diagnose inflammatory, premalignant and malignant lesions. All suspicious lesions on Pap smear should be followed by repeat Pap smear examination, colposcopy and cervical biopsy.

References

[1] Tailor HJ, Patel RD, Patel PR, Bhagat VM. Study of cervical pap smears in atertiary care hospital of South Gujarat, India. Int JRes Med Sci 2016; 4: 286 - 8.
[2] Sreedevi A, Javed R, Dinesh A. Epidemiology of cervical cancerwith special focus on India. Int J Women's Health 2015; 7: 405–14.
[3] Bamanikar SA, Baravkar DS, Chandanwale SS, dapkekar P. Study of Cervical Pap Smears in aTertiary Hospital. Indian Medical Gazette.2014: 250 - 254.
[4] Bamanikar SA, Baravkar D, Chandanwale S, Dharwadkar A, Paranjape S. Study of cervical cytology and its correlation with clinical and histopathological findings. Clin Cancer Investing J (serial online) 2016 (cited 2021 Feb 22); 5: 403 - 8.
[5] [6] Shaki O, Chakrabarty BK, Nagaraja N. A studyon cervical cancer screening in asymptomatic women using Papanicolaousmear in a tertiary care hospital in an urban area of Mumbai, India. JFamily Med Prim Care 2018; 7: 652 - 7.
[7] Chatterjee R, Roy A, Basu S. Detection of type specific human papillomavirus (HPV) DNA in cervical cancers of Indian women. Indian J Pathol Microbiol 1995; 38: 33 - 42.
[8] Bamanikar SA, Baravkar D, Chandanwale S, Dharwadkar A, Paranjape S. Study of cervical cytology and its correlation with clinical and histopathological findings. Clin Cancer Investing J (serial online) 2016 (cited 2021 Feb 22); 5: 403 - 8.
[9] U. Sarma, J. Mahanta, K. Talukdar - Pattern of Abnormal Cervical Cytology in women attending a Tertiary Hospital; International Journal of Scientific and Research Publications; December 2012; Volume 2; Issue 12; ISSN 2250 - 3153
[10] Schiffman MH, Brinton LA. The epidemiology of cervical carcinogenesis. Cancer 1995; 76 10 Suppl: 1888 - 901.
[11] Bosch FX, Manos MM, Muñoz N, Sherman M, Jansen AM, Peto J, *et al*. Prevalence of human papillomavirus in cervical cancer: A worldwide perspective. International Biological Study on Cervical Cancer (IBSCC) Study Group. J Natl Cancer Inst 1995; 87: 796 - 802.
[12] Thakur A, Gupta B, Gupta A, Chauhan R. Factors for cancercervix among rural women of a hilly state: a case - control study. Indian J Public Health 2015; 59: 45–8.
[13] Wyndder EL, Cornfield J, Schroff PD, Doraiswami KR. Astudy of environmental factors in carcinoma cervix. Am JOstet Gynaecol.1954, 63: 1016 - 52.
[14] Buckley JD, Doll R, Harris RWC et al. Case control studyof the husbands of women with dysplasia or carcinoma ofthe cervix uteri. Lancet.1981, ii: 1010 - 15.
[15] Schiffman M et al. Human Papilloma virus and cervicalcancer. Lancet 2007, 370: 890.
[16] The World Health Report, 1995. Bridging the gaps. Geneva: World Health Organization; 1995.
[17] ACOG Practice Bulletin. Clinical management guidelinesfor obstetrician - gynaecologists; 2009.
[18] Cheryl L R, Clair W M and Kevin R. Prevention of cervicalcancer. Critical reviewin Oncology/Haematology.2000, 33: 169 - 185.
[19] Shanthi V, Bhavana G, Mohan rao N, Shyamsundararao B, Chidanandareddy V and Swathi S, Carcinoma cervixscreening – A clinicopathological study, Int J Med ResHealth Sci.2015, 4 (2): 287 - 293.
[20] Rejendra A Kalkar and Yogesh Kulkarini: Screening forcervical cancer: an overview. Obstet Gynecol India.2006, 56 (2).
[21] Amne E. Radar and Peter G. Rose: Atypical Squamouscells of undetermined significance in women over 55. Actacytologica.1999; 43 (3): 357 - 61.
[22] Izabela T. Burja and Sophie K. Thompson: Atypicalglandular cells of undetermined significance on cervicalsmears. Acta cytological.1999, 43 (3): 357 - 56.
[23] Ranabhat SK, Shrestha R and Tiwari M: Analysis ofabnormal epithelial lesions in cervical Pap smears in Mid - Western Nepal: Journal of Pathology of Nepal.2011, 1: 30 - 33.
[24] Mishra S, Srivastava S, Singh U and Srivastava AN: Riskfactors and strategies for control of carcinoma cervix inIndia: Hospital based cytological screening experience of35 years. Indian J Cancer.2009, 46: 155 - 9.
[25] Mandakini MP, Amrish NP and Jigna M: Cervical papsmear study and its utility in cancer screening, to specifythe strategyfor cervical cancer control. National Journal ofCommunity Medicine 2011, 2 (1): 50.
[26] Padmini CP, Indira N, Chaitra R, Das P, Girish BC, Nanda KM, Basu SN. Cytological and colposcopic

evaluation of unhealthy cervix. J Evid Med Health2015; 2: 6920 - 7.
[27] Shaki O, Chakrabarty BK, Nagaraja N. A study on cervical cancer screening in asymptomatic women using Papanicolaou smear in a tertiary care hospital in an urban area of Mumbai, India. J Family Med Prim Care 2018; 7: 652 - 7
[28] Yogita M. Patel, R. N. Gonsai - Pap smear study of cervical cytology; International Journal of Scientific and Research Publications; Volume 3; Issue 11; November 2014; ISSN 2277 - 8179.
[29] Karuna, gaspanal V., Van Dan Brule R - The clinical profile and cervical cytomorphology, Indian Journal of Pathology and Microbiology; 2003; Vol 46 (2); 78.