



Spectrum of Cervical Cytology Findings: Analysis of 800 Pap Smears in a Tertiary Care Hospital in Chikkamagaluru

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KEYWORDS

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ABSTRACT:

Background: Cervical Cancer remains a significant public health concern in India, particularly in rural and semi-urban areas. Pap smear screening is a vital tool for early detection of precancerous and cancerous lesions. This study aims to evaluate cervical cytology findings in 800 cases at a tertiary care hospital in Chikkamagaluru, Karnataka.

Methods: A retrospective study was conducted over a two year period, analyzing 800 pap smears collected from women attending the Gynecology Outpatient Department. The smears were stained using the Papanicolaou method and categorized based on the Bethesda System 2014. Demographic and clinical data were also reviewed.

Results: Among the 800 cases, 71% smears were reported as Negative For Intraepithelial Lesion/ Malignancy (NILM), with infections such as Bacterial vaginosis and candidiasis being the most common findings. Low Grade squamous intraepithelial lesion (LSIL) were observed in 1.8%, while High grade squamous Intraepithelial lesion (HSIL) accounted for 1.7%. Atypical squamous cells of undetermined significance (ASC-US) were noted in 25% of cases. And invasive carcinoma was diagnosed in 0.25%. Women in the age group of 30-50 years exhibited the highest prevalence of abnormal cytology.

Conclusion: This study highlights the utility of Pap Smear screening in detecting a spectrum of cervical abnormalities, including precancerous lesions. Strengthening awareness and accessibility to cervical screening in rural regions like Chikkamagaluru is crucial for reducing the burden of cervical cancer.

INTRODUCTION

Cervical cancer is a major public health challenge globally, with a significant burden in developing countries like India. It accounts for nearly 18.3% incidence and cancer mortality (18.7%) among women in 2020, with a 5-year prevalence of 18.8%¹ and remains the second most common cancer among Indian women. Despite being preventable and curable if detected early, cervical cancer continues to be a leading cause of cancer-related mortality, particularly in rural and underserved areas. (bray *et al.*, 2020)²

The Pap smear test, introduced by Dr. George Papanicolaou, is a simple, cost-effective and highly reliable method for early detection of precancerous and cancerous lesions.³ It enables timely intervention and significantly reduces morbidity and mortality. However, in rural areas like Chikkamagaluru, barriers such as lack of awareness, sociocultural stigma and limited access to healthcare facilities pose significant challenges to implementing widespread screening programs.⁴

According to American Cancer Society (ACS) guidelines for cervical cancer screening, it is recommended that



screening should begin in average risk individuals at age 25 years and cease at age 65 years. American College of Obstetrician and Gynecologists(ACOG) recommends Pap smear screening starting at 21 years of age until the age of 65 years and should be repeated at 3 year interval. In addition, Human Papilloma Virus(HPV) test may be performed for abnormal pap smear tests or as dual testing. In case of abnormal Pap smear report, depending on the type of abnormality, the test may need to be repeated in 6 to 12 months.⁵

The situation of cancer prevalence is alarming in rural population where the majority of women are illiterate and ignorant, adding more to it, fear and embarrassment during the procedure leading to failure and acts as a barrier in performing the test that contribute to the development of cervical cancer. In addition, medical facilities, advise and awareness programmes are almost non-existent.⁶

HPV infection has traditionally been considered to be a necessary condition for the development of most types of squamous cells cervical carcinomas. Nevertheless, in recent years, there has been an increase in data indicating that some cervical tumors, mainly adenocarcinomas, are HPV negative.⁶

Cervical cancer screening cytology—choices available:

- 1 Cervical cytology- based on examination of the cells obtained from transformation zone.
- 2 HPV testing.
- 3 Co-testing- combined test with both cytology and HPV testing.
- 4 Visual inspection test- Done with visual inspection with 3-5%acetic acid and/or Lugol's Iodine.
- 5 New strategies-High risk HPV E6/E7 m RNA test, tests for DNA integration, genome mutation and DNA methylation.⁶

This study aims to evaluate the spectrum of cervical cytological findings in 800 cases examined at a tertiary care hospital in Chikkamagaluru. By analyzing the prevalence and types of abnormalities detected, this study seeks to underscore the importance of regular Pap smear screening and the need for focused interventions in rural settings.

MATERIALS AND METHODS

A retrospective study was conducted in the Department of Pathology at a tertiary care hospital in Chikkamagaluru over two years. The study included 800 women who attended the gynecology outpatient Department for various complaints or routine check-ups.

Sample Collection and Sample Processing :

The patients were given prior instructions by the gynecologists prior the cytological examination. Patients were placed in the lithotomy position and a sterile Cusco's speculum was inserted into the vagina. The posterior vaginal wall was retracted posteriorly and the anterior vaginal wall anteriorly for proper visualization of cervix and vaginal wall. After per speculum examination of the patient, the longer projection of Ayre's spatula was inserted in cervix near squamocolumnar junction and rotated through 360°.

The cytological smears were taken by gynecologists for routine screening by conventional method and immediately sent to Pathology Department for processing. All the slides were labelled immediately and dipped in 95% ethyl alcohol. Pap staining was prepared as per the proper staining procedure and slides were interpreted.

Inclusion Criteria

All sexually active women coming to Gynecology Department in the age group of 21-65 years with the complaints of vaginal discharge, intermenstrual bleeding, postmenopausal bleeding, irregular menstruation, who consented for Pap smear were included in this study.

Exclusion Criteria

Women aged less than 20 years, pregnant females, previous history of cervical cancer treatment, women without sexual history, women who have undergone hysterectomy, who have used any sort of vaginal cream, women with menstrual bleeding, cervical growth and patients not willing to do the Pap test were all excluded from the study.

Slides with improper fixation, failure to obtain cellular sample as per Adequacy criteria, excessive mucus, blood or purulent exudate were excluded in the study.



STATISTICAL ANALYSIS

Data was entered in Excel Sheet and percentage was calculated depending on the cases categorized.

RESULTS

This study was conducted at a tertiary care hospital in Chikkamagaluru. Study included participation of 800 women. Demographic data like age, marital status, education, parity and contraception method usage was tabulated in Table 1.

Table 1: Socio- demographic data of the study participants

SOCIO DEMOGRAPHIC CHARACTERISTICS		NUMBER	PERCENTAGE
Age group (years)	21-30	98	12.3
	31-40	430	53.8
	41-50	149	18.6
	51-60	103	12.8
	Above 60	20	2.5
Parity Distribution	Nulliparous	21	2.7
	Primipara	120	15
	Multipara	659	82.3
Education level	Uneducated	57	7.1
	Matric	409	51.2
	Higher Secondary	267	33.3
	Graduate	67	8.4
Marital Status	Married	800	100
	Unmarried	0	0
Contraception Usage	None	93	11.5
	Barrier	590	73.8

	Tubal Ligation	99	12.4
	OCP	18	2.3

Highest number of patients (53.8%) belong to age group 31-40 years, followed by 41-50 years(18.6%) and least number of patients were above 60 years (2.5%).

Out of 800 women participants, 659 were multipara(82.3%) and 21(2.6%) were nulliparous. Coming to education, 409(51.1%) had completed primary school education, 267(33.3%) had completed higher secondary education and 67(8.4%) women were graduates and above.

The most common family planning method used as per this study was barrier method, used by 590(73.8%) while 93 women were not using any form of family planning methods. Most of the women were of low socioeconomic status and few of them gave passive smoking history.

None of the women who participated in this study had Pap smear testing earlier in this life. Only 11 women knew that there are tests available that can detect the cancerous lesions of the cervix. But none of the participants knew about the test that can detect the precancerous lesions.

Chief complaints of the study participants was tabulated in Table 2.

Table 2: Complaints of the Study Participants

CHIEF COMPLAINTS	NUMBER	PERCENTAGE
Irregular menses	289	36.1
White Discharge	198	24.8
Abdominal pain	113	14.1
Regular check up	182	22.8
Post menopausal Bleeding	8	1
Urinary Problems	4	0.5
Dyspareunia	6	0.7



Table 3: Per speculum Findings of the study participants

PER SPECULUM FINDINGS	NUMBER	PERCENTAGE
Normal looking cervix	197	24.7
Whitish discharge	378	47.4
UV prolapse	21	2.6
Cervical Erosion	131	16.3
Congested Hypertrophied cervix	70	8.7
Bleeds on touch	3	0.3

Table 4: Spectrum of Cytological diagnosis on Pap smear reporting by Bethesda System 2014 of the study participants

PAP SMEAR DIAGNOSIS	NUMBER	PERCENTAGE
UNSATISFACTORY	7	0.87
NILM	568	70.1
A. Inflammatory	471	59.9
1. Non-specific	385	48
2. Candida	22	3
3. Bacterial vaginosis	64	8.9
B. Atrophic smear	18	1.5
C. No other changes	79	8.7
EPITHELIAL CELL ABNORMALITIES	232	29
1. ASCUS	201	25
2. LSIL	15	1.8
3. HSIL	14	1.7
4. SCC	2	0.25

Table 5: Cervical Epithelial cell Abnormalities in relation to age of the study populations

Age Group (years)	ASCUS(%)	LSIL(%)	HSIL(%)	SCC(%)	%
21-30	0	0	0	0	0
31-40	19	0	0	0	8
41-50	179	16	0	0	84
51-60	2	2	3	0	3
>60	1	8	0	2	5

On per speculum examination, 197 women (24.7%) had normal healthy looking cervix, 378 (47.3%) had white discharge, 21 (2.6%) had UV prolapse, 131 (16.3%) had cervical erosion, 70 (8.7%) had congested and hypertrophied cervix, 3 women (0.3%) had friable cervix which bled on touch.

Out of 800 cases, 7 cases (0.87%) were unsatisfactory for evaluation, 568 cases (70.1%) were reported as Negative for Intraepithelial lesion/ malignancy. In cases with Negative for Intraepithelial lesion/ malignancy, 471 (59.9%) cases were inflammatory, 64 (8.9%) were diagnosed as Bacterial Vaginosis followed by 22 (3%) cases were categorized under candida and 232 cases (29%) had epithelial cell abnormality. Among 232 cases of intraepithelial lesion- 201 (25%) cases were categorized under ASCUS, 15 (1.8%) cases under LSIL, 2 (1.7%) cases were categorized under HSIL and 2 (0.25%) cases was Squamous cell carcinoma of cervix. The most frequent epithelial abnormality was ASCUS. Nearly half of the patients with abnormal pap smears presented with a normal looking cervix.

DISCUSSION

Cervical cancer is one of the leading malignancies in Indian females and is a significant public health issue worldwide, with millions of women affected each year. According to World Health Organization and International Agency for Research on Cancer (IARC), Cervical cancer is the 4th most common cancer in women globally. In 2020, there were approximately 604,000 new cases of cervical cancer worldwide.



It is a well known fact that introduction of regular screening programs has led to a decline in cervical cancer mortality in many countries including India. Therefore, the importance of our study conducted in a tertiary care hospital in Chikkamagaluru, where there are very limited publishes data concerning the pattern of epithelial cell abnormality in pap smears.

It is thought that the average age of women population in study was appropriate considering the fact that the common age to develop cervical cancer is between 41 and 50 years and its precursor lesion usually appears 5-10 years earlier. It is recommended that the women should have at least one pap smear test before the age of 45 years.

In our study, majority of the patients belong to third decade(53.7%) followed by fourth decade (18.6%). Agarwal *et al.*(2023), Verma *et al.*(2016), Vedvathi *et al.*(2019) and Vijaya *et al.*(2021) also had similar findings in their studies. This reveals that pap smear

cytology is still delayed by many years in majority of women of this country. The healthcare professionals should request pap smear testing and should educate people about the benefits of pap smear test.

The most common presenting complaint in this study was white discharge followed by cervical erosion. Manjit *et al.*(2012), Pushplata *et al.* (2018) and Singh *et al.*(2018) also recorded white discharge as the most common presenting complain in their respective studies.

In our study, inflammatory smears comprised 58.8%. This was comparable with various other studies like Manan *et al.* (2019) and Laxmi *et al.* (2020) who in their studies 54% and 69% respectively. Among specific inflammation, Bacterial vaginosis was the leading cause in our study. Similar findings was seen in the study done by Geethu *et al.*(2016), Agarwal *et al.*(2023) and Manjumdar *et al.* (2020). We did not find any case of Trichomonas Vaginalis and Herpes.

Table 6: Studies comparing prevalence of epithelial abnormalities in the study participants

Author	Year	Place	No. of cases	Total Prevalence	ASCUS(%)	LSIL(%)	HSIL(%)	SCC(%)
Arul Anne ⁷	2016	Tamil Nadu	630	3.8	0.9	0.5	0.6	0.8
Verma <i>et al.</i> ⁸	2016	H.P	200	9	1	5.5	2.5	0
Sarala <i>et al.</i> ⁵	2017	T.S	1000	1.2	0.6	0.2	0.3	0.1
Pushplata <i>et al.</i> ⁹	2018	U.P	1650	8.48	2.9	5.09	0.48	0
Sharma <i>et al.</i> ¹⁰	2018	U.P	450	6.9	3.3	1.2	0.4	0.2
Vedvathi <i>et al.</i> ¹¹	2019	Karnataka	200	9	4	3.5	1	0
Laxmi <i>et al.</i> ¹²	2020	Rajasthan	576	10.06	4.94	1.33	0.48	0.24
Agarwal <i>et al.</i> ⁶	2021	Maharashtra	240	5.83	2.17	2.6	0.86	0.43
Present study	2024	Chikkamagaluru(Karnat aka)	800	8.3	25	1.8	1.7	0.25



In this study, when we analysed the smears, 71% were Negative for Intraepithelial Lesion/ Malignancy and 29% smears were classified as epithelial lesions.

ASC-US, LSIL, HSIL and Squamous Cell Carcinoma were found in 25%, 1.8%, 1.7% and 0.25% respectively in this study. Most cases of ASCUS were in the range of 41-50 years and two cases of SCC was seen in above 60 years of age. HSIL was seen in females above 50 years of age.

In age group of 21-30 years, majority of Pap smears showed no epithelial cell abnormality, whereas abnormal Pap smears were seen with increase in age.

Limitations of this study is as this is a retrospective study, eventual outcomes of all patients could not be known and hence, no consistent pattern of disease is established. Use of Liquid based cytology might have reduced the number of unsatisfactory smears, but is not cost effective in our set up.

CONCLUSION

This study highlights the significant burden of cervical abnormalities in Chikkamagaluru, comparable to other rural settings in India and developing nations. The findings emphasize the urgent need for strengthening cervical cancer prevention programs, improving access to screening and promoting HPV vaccination. By drawing comparisons to other studies, it is evident that addressing socio-economic and healthcare disparities is key to reducing cervical cancer morbidity and mortality in rural India.

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