



A STUDY OF PAP SMEAR EXAMINATION IN HIV POSITIVE WOMEN

Pathology

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ABSTRACT

Background: The Papanicolaou smear, a cytological screening method in the early detection of cervical premalignant and malignant lesion. **Objectives:** To assess the effectiveness of Pap smear screening in detecting cervical lesions in HIV- infected females and explore its implications for cervical cancer prevention. **Methods:** This was a prospective hospital based study of 300 cases of Human immunodeficiency virus(HIV) positive women on age group of 18 years and older on / not on anti-retroviral therapy from July 2024 to June 2025. Detailed clinical history, obstetric and menstrual history along with clinical examination findings, per abdominal examination, per speculum examination, per vaginal examination and relevant findings were recorded. **Results:** A total of 300 cases were studied. The commonest pattern observed was NILM (Negative for intra-epithelial malignancy) which comprised of 216 cases (72%). These also included reactive cellular changes associated with inflammation, repair and atrophy. 64 cases (21.3%) were of inflammatory lesion followed by 20 cases (6.7%) of epithelial cell abnormality and malignancy. **Conclusion:** To achieve the millennium goal of decreasing mortality by cervical cancer, adequate screening of HIV positive women by PAP smear is necessary.

KEYWORDS

HIV, Papanicolaou smear, cytopathology, Squamous cell abnormalities.

INTRODUCTION

- HIV-infected women face a higher prevalence of HPV infections compared to HIV-negative women. HIV spreads through body fluids, targets CD4+ T cells and can progress to AIDS due to severe immunodeficiency with eradication made difficult by its integration into host DNA. Compromised immunity in HIV positive women increases the persistence of HPV infections with a lifetime risk of about 79% for at least one HPV infection and the risk of cervical intraepithelial neoplasia and invasive cervical cancer.(1,2)
- The World Health Organization (WHO) recognizes HIV-positive women as a high-risk group and recommends more frequent cervical cancer screening compared to the general population.(3)
- Pap smear screening is simple and cost-effective tool for early detection and prevention of cervical cancer, recommended for women aged 21-65 with screening intervals based on age and prior results, though its uptake among HIV positive women remains low, with only about 25% undergoing routine screening.(1)

Inclusion Criteria

- Women both on and off antiretroviral therapy.
- Women aged 18 years and older.

Procedure

- The patient is positioned in the lithotomy position.
- Sample is collected from endocervix and ectocervix with spatula or cytobrush on a glass slide.
- The sample is stained using the Papanicolaou technique followed by microscopic examination.

Table 1 : Classification Of Cervical Cytology

The Bethesda System (TBS):

- Introduced in 1988, regularly updated.
- Categories:**

Negative For Intraepithelial Lesion Or Malignancy (NILM):

- Normal cytology or benign changes (e.g., infections like trichomoniasis or candidiasis)

Epithelial Cell Abnormalities:

- Squamous Cell Abnormalities:**

(i) Atypical Squamous Cells:

- Of undetermined significance (ASC-US)
- Cannot exclude HSIL (ASC-H)

(ii) Low-grade Squamous Intraepithelial Lesion (LSIL)

- Linked to Human papilloma virus (HPV), mild dysplasia / Cervical intraepithelial neoplasm I (CIN I)

(iii) High-grade Squamous Intraepithelial Lesion (HSIL)

- Moderate/severe dysplasia (CIN 2/3)

(iv) Squamous Cell Carcinoma (SCC)

Glandular Cell Abnormalities:

- Atypical glandular cells
- Adenocarcinoma in situ
- Adenocarcinoma

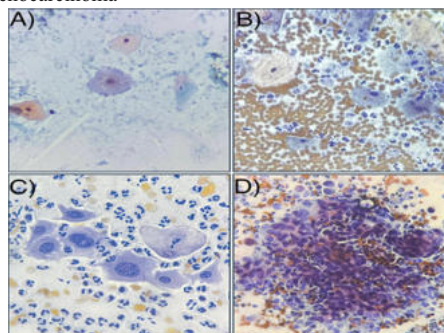


Figure 1: NILM and Epithelial cell abnormalities

- A) Bacterial vaginosis [40x, Pap stain]
B) Trichomonas vaginalis [40x, Pap stain]
C) LSIL [40x, Pap stain]
D) HSIL [40x, Pap stain]

RESULTS

In the present study, out of 300 cases, 280 (93.3%) considered of NILM and inflammatory lesions.

Premalignant and malignant cases represented 20 cases (6.7%).

Table 2 : Reports of Pap smear examination

	Diagnosis	No. of cases	Percentage (%)
1	NILM without inflammatory changes	196	65.3
2	NILM with inflammatory changes	64	21.3
3	NILM with Atrophic changes	20	6.7
4	ASCUS	08	2.7
5	LSIL	06	02
6	ASC-H	02	0.7

7	HSIL	03	01
8	Squamous cell carcinoma	01	0.3

NILM: Negative for intraepithelial lesion or malignancy

ASCUS: Atypical squamous cells of unknown significance

LSIL: Low grade Squamous intraepithelial lesion

ASC-H: Atypical squamous cells, cannot exclude a high grade squamous intraepithelial lesion

HSIL: High grade squamous intraepithelial lesion

Table-2 shows that maximum number of cases (HIV positive women) were NILM without inflammatory changes (65.3%) followed by NILM with inflammatory changes (21.3%).

Premalignant and malignant conditions, though less frequent, were significant findings, accounting for 6.7% of cases.

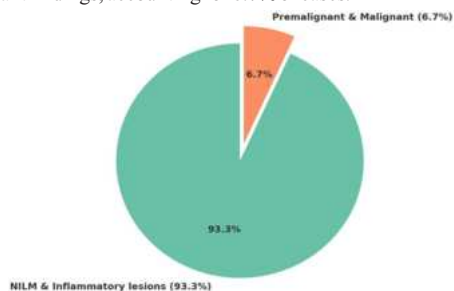


Chart 1: Distribution of Pap smear findings

Table 3 : Distribution of inflammatory smears with etiological agent

Infectious organism	No. of cases	Percentage (%)
Bacterial vaginosis	32	10.7
Candida	18	6.0
Trichomonas vaginalis	14	4.7

Table-3 shows that in cases (HIV positive women) the most common infection was Bacterial vaginosis (10.7%) followed by Candida infection (6.0%) followed by Trichomonas vaginalis (4.7%).

DISCUSSION

The present "Study of Pap smear examination in HIV positive women" was carried on 300 HIV positive women in pathology department, SMIMER Hospital, Surat.

This study highlights the spectrum of cytological abnormalities encountered in Pap smears on HIV positive women and underscores the importance of cervical cancer screening in this high risk population.(7,8)

HIV positive women are highly vulnerable to opportunistic infections due to immunosuppression, making their management essential for cervical health, while detection of early neoplastic changes (ASCUS, LSIL, HSIL) and even malignant cases (SCC) highlights the importance of routine screening programs.(9)

Human immunodeficiency virus (HIV) infected women constitute one of the highest risk population subgroups for increased incidence and rapid progression of HPV induced cervical intraepithelial neoplasia (CIN) and invasive cervical cancer. HIV positive women have a 2-4 times higher risk of developing cervical abnormalities, with 12.1% showing abnormal cytology compared to 5.4% in HIV-negative women.(6,10)

Study shows HIV-infected women have high prevalence of HPV infection with multiple HPV type, thus having greater risk of epithelial abnormality.(4)

The persistent high risk HPV co-infection, low CD4 count (< 200 cells/mm³) and higher HIV viral loads increasing the likelihood of serve abnormalities.(2,5)

The effectiveness of Pap smear in detecting CIN in HIV infected women has been reported to have a sensitivity varying from 60 to 80% where as specificity ranges from 65 to 85%.(4)

Pap smear screening, when integrated into HIV care programs, helps prevent progression to invasive cervical cancer, enables early detection that saves lives and can significantly reduce cervical cancer

mortality worldwide.

CONCLUSION

Pap smear screening is highly effective in detecting cervical abnormalities early among HIV-positive women and prevents progression to invasive cancer in high risk groups.

Routine screening, integrated into HIV care protocols, ensures timely intervention and better outcomes.

Global evidence supports Pap smear programs in reducing cervical cancer incidence and mortality, especially when combined with HIV treatment.

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