

Cytopathological pattern of cervical pap smears: A retrospective descriptive study at a tertiary care centre in a South Indian state

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Abstract:

Background: Cervical cancer ranks as the 2nd most frequent cancer among women in India. Papanicolaou (Pap) smear test is the mainstay of cervical cancer screening.

Objective: To estimate the prevalence of cervical epithelial abnormalities and to evaluate the pattern of cervical Pap smear cytology at a tertiary care centre.

Materials and Methods: This is a hospital based retrospective descriptive study conducted among the patients who previously attended OPD of Department of Obstetrics and Gynaecology between the period of May 2022 and May 2023 and included evaluation of all the pap smears (the Bethesda system 2014) reported during this time period.

Results: In the present study, 1318 cases were analysed during the study period. 34 smears (2.57%) were found to be unsatisfactory for evaluation and 1267 (96.13%) were NIEL/ NIEM. 5 smears (0.37%) were found to be ASC-US, 7 smears (0.53%) were found to be ASC-H, 2 smears (0.15%) were found to be HSIL and 4 smears (0.30%) were found to be reported with Squamous cell carcinoma. Among the smears which reported infections, bacterial vaginosis was the most common one.

Conclusion: It was reported that premalignant and malignant lesions of cervix are not much common in our setting.

Keywords: Cervical cancer, Papanicolaou smear, cytological features

Introduction:

Cancer of the cervix, an escalating major health issue and a vital cause of mortality in women throughout the world, the incidence of which is increasing worldwide, is the fourth most frequently occurring cancer in women (seventh most common type of cancer overall) after breast, colorectal and lung cancers ⁽¹⁾. The incidence is less in developed countries while in developing countries like India, the incidence is still elevated. India with a population of 511.4 million women aged 15 years and older who are at risk of developing cervical cancer has an incidence of 18.7% accounting for death rate of 11.7% in women ⁽²⁾. Current estimates indicate that every year 123907 women are diagnosed with cervical cancer and 77348 die from the disease ⁽²⁾. Cervical cancer ranks as the 2nd most frequent cancer among women in India and the 2nd most frequent cancer among women between 15 and 44 years of age ⁽²⁾. As per the World

Cancer statistics, > 80% of all the cervical cancer cases are reported in low-resource and developing countries, both due to lack of awareness regarding the disease and also due to difficulty in implementing effective cytology-based screening programs⁽³⁾.

Cervical cancer being a preventable disease due to the long preinvasive stage, can be detected early and treated appropriately if robust screening programs are implemented⁽⁴⁾. The primary screening test for detection of precancerous cervical intraepithelial neoplasia and the early stage of invasive cervical cancer is the Papanicolaou (Pap) smear test which can identify early cervical epithelial changes. It is an effective method of detecting, preventing and delaying the progress of cervical cancer developed by Dr. George Papanicolaou in the 1940s who discovered that precancerous and cancerous cells could be identified in cytologic samples from vaginal aspirates⁽⁵⁾.

The screening coverage in India is atrocious and grossly inadequate, even in the existence of national guidelines and standard operating procedures, which is essentially due to inequality between infrastructure, resources and outsized population⁽⁶⁾. And hence, in most of the cases, cervical cancer is diagnosed based on opportunistic screening or after the onset of symptoms.

Cervical cytology is done for various diseases affecting the female genital tract like inflammatory (Bacterial, Viral, Fungal and Parasitic), degenerative or retrogressive, cytohormonal changes and neoplastic. Previously there was no unanimous reporting system but now a days, reporting system for cervical smear is Bethesda system (2001, latest revision done in 2014) which has unified various overlapping terminologies and created a standardized framework for laboratory reports that includes a descriptive diagnosis and an evaluation of specimen adequacy⁽⁷⁾.

Only limited research is available regarding the prevalence of various cervical epithelial abnormalities in various populations in India, especially in Karnataka and hence, this study was undertaken using the revised Bethesda System, to estimate the prevalence of cervical epithelial abnormalities and to evaluate the pattern of cervical Pap smear cytology.

Materials and Methods:

The study was a one year retrospective descriptive study conducted among the patients who previously attended OPD of Department of Obstetrics and Gynaecology between the period of May 2022 and May 2023 at AJ institute of medical sciences, Mangalore, Karnataka and included evaluation of all the pap smears reported during this time period. All the patients aged above 25 years, who have undergone Pap smear test during this period, were included in the study. Those aged above 65 years with 2 consecutive negative primary Human papillomavirus (HPV) tests or cotests or 3 negative cytology tests within the past 10 years and women post hysterectomy without history of Cervical intraepithelial neoplasia II (CIN II) or more severe diagnosis in the past 25 years or known cases of cervical cancer and pregnant females were excluded from the current study. A total of 1318 sexually active women were studied for further analysis.

The study was approved by Institutional Ethics Committee but considering the design of the current study which was a retrospective study, no separate informed consent from the study participants was required. Conventional Pap smears were taken from both symptomatic and

asymptomatic patients who had come for routine cervical screening to the OPD with the help of Ayre's spatula from the squamo columnar junction by gynecologists. Both ectocervix and endocervix were sampled. After immediate fixation in 95% isopropyl alcohol, these slides were stained by rapid Pap stain and mounted with Distrene dibutyl phthalate xylene (DPX), labelled and then reported according to the revised Bethesda System 2014 and classified into those negative for intraepithelial neoplasia and epithelial cell abnormalities (ECA) that include squamous and glandular cells⁽⁸⁾.

All abnormal epithelial lesions (SIL) were categorized under: atypical squamous cell of undetermined significance (ASCUS), low-grade squamous intraepithelial lesion (LSIL), atypical squamous cell (ASCH) cannot exclude high grade squamous intraepithelial lesion (HSIL), highgrade squamous intraepithelial lesion (HSIL), atypical glandular cells of undetermined significance (AGUS) and other atypical cells not otherwise specified. The malignant categories were squamous cell carcinoma (SCC), adenocarcinoma and other malignancy not otherwise specified. The details regarding patient's clinical presentation were collected from patient's case notes & the cytopathologic findings of the Pap smears were collected from slide archive. Data was entered in Excel sheet and analyzed.

Results:

In the study period i.e., in a span of one year, a total of 1318 Pap smears were examined from the patients attending the OPD. Out of 1318 Pap smears, 34 smears (2.57%) were found to be unsatisfactory for evaluation and 1267 (96.13%) were Negative for Intraepithelial Lesion/ Malignancy (NIEL/NIEM). The remaining smears belonged to various other categories as depicted in Table 1. The inadequate sample smears or the smears obscured with blood were included in the unsatisfactory group. 5 smears (0.37%) were found to be ASC-US, 7 smears (0.53%) were found to be ASC-H, 2 smears (0.15%) were found to be HSIL and 4 smears (0.30%) were found to be reported with Squamous cell carcinoma.

1267 cases reported as NIEL/NIEM had cytological features of various conditions as shown in Table 2. 132 smears (10.41%) had atrophy, 518 smears (40.88%) were found to be have inflammatory changes, 165 smears (13.02%) were found to have bacterial vaginosis, 128 smears (10.10%) were found to have candidiasis and 7 smears (0.55%) were found to have trichomoniasis. Among the smears which reported infections, bacterial vaginosis was the most common one.

Discussion:

Cervical cancer can be cured if the diagnosis was made at an early stage and if treated promptly. Comprehensive cervical cancer control includes primary prevention (vaccination against HPV), secondary prevention (screening and treatment of pre-cancerous lesions), tertiary prevention (diagnosis and treatment of invasive cervical cancer) and palliative care⁽⁹⁾. Pap smear test is a secondary preventive method designed to identify premalignant and malignant lesions.

Conventional Pap test have false negative rate of 14-33% of which two thirds is due to limitation of sampling and slide preparation and may lead to inaccuracy and equivocal diagnosis⁽⁵⁾. Out of the 1318 cases in the current study subjected to Pap smear test, 34 smears (2.57%) were found to

be unsatisfactory for evaluation mainly due to inadequate squamous component or obscuring inflammation. These results were found to be in coherent with other study results like Geethu G. Nair et al ⁽¹⁰⁾ done in Kerala which, showed 55 (2.71%) cases were unsatisfactory for evaluation of epithelial abnormality and benign cytology results were seen in 1924 (94.87%) of the samples. Another study done by Umarani MK et al ⁽¹¹⁾ in tertiary care hospital in Mysuru district of Karnataka state showed 132 smears (9.3%) were found to be unsatisfactory for evaluation. This study results showed a higher proportion of unsatisfactory smears which may account due to difference in collection technique or due to non-accessibility of squamo-columnar junction in cases of prolapse of uterus. Similarly, a little higher proportion of unsatisfactory smears than that compared to the proportion reported in the current study were reported in other studies like 4.8% in a retrospective study done by Vaghela e al ⁽¹²⁾, 5.71% in the study done by Bamanikar et al ⁽¹³⁾ and 4.5% in another study conducted by Rajput et al ⁽⁶⁾.

In the current study 1267 (96.13%) were Negative for Intraepithelial Lesion/ Malignancy (NIEL/NIEM) and the rest revealed epithelial abnormalities like 0.37% of smears were found to be ASC-US, 0.53% were found to be ASC-H, 0.15% were found to be HSIL and 0.30% were found to be reported with Squamous cell carcinoma. Study done by Geethu G. Nair et al ⁽¹⁰⁾ reported benign cytology (NILM) in 1924 (94.87%) of the samples and 49 (2.41%) cases revealed epithelial abnormalities. These study results were very close to the proportions reported in our current study. Another study done by Umarani MK et al ⁽¹¹⁾ showed 1164 (82.08%) were Negative for Intraepithelial Lesion/ Malignancy (NILM) which is similar to that of the current study and also the proportion of smears that showed epithelial abnormalities are also very close to that reported in the current study. Colposcopy is indicated followed by colposcopic biopsies when abnormal cells are detected in a Pap smear. Diagnosis and treatment of precursors of cervical cancer prevents further development of cervical cancer. Detection of SCC might be due to non-implementation or failure of regular effective cytology-based screening programs.

Pap smear, an integral part of the comprehensive health care of women, in addition to being a tool of cancer diagnosis, can be used for diagnosis of infections such as trichomonas, HPV and herpes and also for classification of the hormonal pattern ⁽¹⁴⁾. In the current study smears with inflammatory changes were seen mainly in women in the reproductive age group. Out of the 1267 cases reported as NIEL/NIEM 10.41% smears showed atrophy, 40.88% smears showed inflammatory changes, 13.02% smears showed bacterial vaginosis, 10.10% smears showed candidiasis and 0.55% smears showed trichomoniasis. Among the smears which reported infections, bacterial vaginosis was the most common one. In coherent with the current study results, non-specific inflammatory smears formed the majority of cases in the studies of Geethu G. Nair et al ⁽¹⁰⁾, Umarani MK et al ⁽¹¹⁾ and Vaghela et al ⁽¹²⁾. Study by Geethu G. Nair et al ⁽¹⁰⁾ reported infections made up 128 cases (6.31%) while remaining were noninfectious. Bacterial vaginosis was the most common infection. Another study done by Shilpa S Biradar et al ⁽¹⁵⁾ reported that bacterial vaginosis is the commonest infection seen in 122 cases (7.27%) followed by vaginal candidiasis in 20 cases (1.19%). These results were found to be in coherent with our current study results.

The limitation of the current study is that it being a hospital based study, the results cannot be generalized and may not be a true reflection of the proportions of that of the local population.

Biradar SS, Rashmi S. An Analysis of Various Cytopathological Patterns on Papanicolaou smears-Cervical Cytology: A Study in Tertiary Care Hospital. Int J Clin Diagn Pathol. 2020;3(1):385–99

Community sensitization on awareness regarding prevention of cervical cancer by implementing proper cervical cancer screening like Pap test and HPV vaccine for adolescent girls to reduce the incidence of cervical cancer is the need of the hour.

Conclusion:

In the current study it was reported that premalignant and malignant lesions of cervix are not much common in our setting. Pap smear, a simple, useful, economical, safe and effective test to diagnose cervical lesions at early stage and helps the clinician in efficient management of these cases, also plays a major role in detecting inflammatory lesions including the identification of causative organism and atrophic changes. There is a need for community awareness by widespread media and educational programs about the Pap smear test, about its goal and the required frequency of application.

Table 1: Cervicovaginal cytology interpretation according to the 2014 Bethesda System for Reporting Cervical Cytology

Interpretation /Results	Number of cases	Percentage
NIEL/NIEM	1267	96.13%
Unsatisfactory	34	2.57%
ASC-US	05	0.37%
ASC-H	07	0.53%
HSIL	02	0.15%
Squamous cell carcinoma	04	0.30%
Total	1318	100%

Table 2: Distribution of NIEL/NIEM cases

Interpretation /Results	Number of cases	Percentage
Atrophy	132	10.41%
Inflammatory Changes	518	40.88%
Bacterial Vaginosis	165	13.02%
Candidiasis	128	10.10%
Trichomoniasis	7	0.55%
No Assoc. Changes	317	25.01%
Total	1267	100%

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