Section: Miscellaneous

Original Research Article

PREVALENCE AND PATTERNS OF PAP SMEAR ABNORMALITIES AMONG ASYMPTOMATIC WOMEN: A DESCRIPTIVE STUDY FROM A SOUTH INDIAN TERTIARY HOSPITAL

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ABSTRACT

Background: Cervical cancer is the second most common cancer among Indian women, yet screening uptake remains very low. Most screening done are opportunistic screening done when they come to a hospital for gynecological problems This study assessed the cytological profile of Pap smears among asymptomatic women undergoing routine health checkups at a tertiary care center in South India, to estimate the prevalence of premalignant and malignant changes in this group.

Materials and Methods: A hospital based retrospective cross-sectional descriptive study was conducted from July to December 2024. Hospital records of 1,103 women aged 30–65 years who underwent Pap smear screening were reviewed. After excluding 22 with gynecological symptoms, 1,081 asymptomatic women were included. Demographic and clinical data were collected, and smears were reported using the Bethesda System 2014. Descriptive statistics was applied.

Results: The mean age was 43 ± 6 years; with 79.8% living with their partners, 14.3% separated, divorced, or widowed, and 5.9% unmarried. 71.6% were premenopausal. Of the 1,081 smears, 85.3% (n=921) were negative for intraepithelial lesion or malignancy (NILM), 6.0% (n=65) showed epithelial abnormalities, and 8.7% (n=95) were unsatisfactory. Among NILM cases, 28% showed no additional changes, while bacterial vaginosis (21.8%) and Candida infection (18.8%) were the leading infections. Epithelial abnormalities included LSIL (56.9%), ASC-US (20%), HSIL (17%), and SCC (6.1%).

Conclusion: A relatively high proportion of asymptomatic women were found to have premalignant or malignant cervical changes, underscoring the inadequacy of relying solely on opportunistic screening in gynecology clinics. The high prevalence of infections further highlights the added value of Pap smears in detecting non-malignant conditions. Community-based, routine cervical cancer screening should be made more acceptable & accessible to improve early detection and reduce cervical cancer burden in India.

Keywords: Cervical cancer, Screening, Pap smear, Asymptomatic.

INTRODUCTION

Over the past few decades, there has been a slow shift in the focus of public health from infectious diseases to non-infectious diseases in India.[1] By 2023 non-communicable diseases contributed to more than 60% of all mortalities in the country. Among the non-infectious diseases, cancers have become a major contributor, particularly in terms of mortality. Cervical cancers have been the second most common

cancer among women in the country with an incidence of 17.7% among all ages in 2022. It also contributed to 8.7% of all deaths due to cancer in India.[2] Most cervical cancers are diagnosed at later stages, after some kind of health problem drive the women to seek help, and hence have poor outcomes. Thus, the most effective way to ensure cervical cancer has a better prognosis is to identify patients at the earliest possible stage i.e. by screening.

For the past few decades, the medical community has had access to Papanicolaou smear testing or Pap test as its commonly known, which has been proven to be a good screening tool.[3] A Pap Smear Test is a procedure used to collect cells from the cervix (the lower part of the uterus) to detect abnormalities or infections.[4] The sensitivity of conventional Pap cytology is approximately 60% and its specificity ranges from 97%.[5] The use of HPV tests and Pap smears is essential for early detection of precancerous changes, allowing us to intervene early and potentially save lives. HPV test is more accurate but more expensive, and as of now only available in few centers in the country. Pap smear screening has proven to be effective in our country, particularly in rural settings.[6] In our country, women at 30 years and above are advised Pap test every 3 years till 65 years of age.[4] However, according to NFHS -5, less than 2 percent of vulnerable women (aged 30-49), have ever undergone screening.[7]

The other major mode of intervention is HPV vaccination. Though the HPV vaccine is expected to be part of the national immunization program by the end of 2025, it is focused on girls. Thus, screening is expected to remain the mainstay in the control of cervical cancer.

In India, only around half the women in the reproductive age group are aware of cervical cancer with some variation across different parts of the country. The overall knowledge and awareness of cervical cancer is slowly improving. However, within the same population, knowledge about Pap smear is significantly lower. This, in turn, translated to poor uptake of cancer screening services.[8] When doing Behaviour change communication (BCC) activities for cervical cancer and its screening, the information regarding the chance of having a positive test, when there are no specific symptoms, might prove crucial. Hence, the current study was done to add to the knowledge regarding the profile of Pap smear results in asymptomatic patients who had come for a general checkup to a tertiary care hospital.

MATERIALS AND METHODS

A retrospective cross-sectional descriptive study was conducted at a tertiary care hospital in South India to evaluate the cytological findings of Pap smear screening among asymptomatic women. The study utilized existing hospital records of patients who had undergone routine cervical cancer screening as part of general health check-ups. The study period spanned six months, from July 2024 to December 2024.

The study included female patients aged 30 years and above who underwent Pap smear testing during the aforementioned period. Patients were selected through time-bound sampling, and a total of 1081 patient records were included in the final analysis. Only asymptomatic women with no documented complaints suggestive of cervical pathology (e.g., abnormal vaginal bleeding, discharge, or pelvic pain) were considered for inclusion.

Patients with any clinical history or indication suggestive of uterine cervical pathology, such as previously diagnosed cervical intraepithelial neoplasia (CIN), carcinoma cervix, visible cervical lesions, or any gynecological symptoms prompting diagnostic Pap smear, were excluded from the study. This ensured that only cases screened as part of routine preventive health checkups were analyzed

Following approval from the Institutional Ethics Committee (IEC) and permission from the hospital administration, data were retrieved from the Medical Records Department (MRD). Patient identifiers were anonymized to maintain confidentiality, and each record was assigned a unique study code.

Demographic details and Pap smear cytology results were extracted using a structured proforma. Relevant information such as age, parity (if available), and cytological diagnosis was collected. Only records with complete data on Pap smear reports were considered valid for inclusion in the final dataset.

The cytological classifications recorded were based on the Bethesda System 2014 terminology,[9] were Negative for Intraepithelial Lesion or Malignancy (NILM) & Epithelial cell abnormality are the major classification. Epithelial cell abnormalities are further classified into Atypical Squamous Cells of Undetermined Significance (ASC-US), Low-grade Squamous Intraepithelial Lesion (LSIL), High-grade Squamous Intraepithelial Lesion (HSIL), Atypical Glandular Cells (AGC) & Squamous Cell Carcinoma (SCC) and other malignancies

The extracted data were entered into Microsoft Excel 2021, cleaned for inconsistencies or missing variables, and subsequently analyzed using GNU PSPP software (version 2.0.0)

Descriptive statistics were used to summarize the findings. The results were presented as frequencies and percentages for categorical variables such as Pap smear outcomes. No inferential statistics were applied, as the study was descriptive in nature.

RESULTS

A total of 1103 women aged between 30 and 65 years had underdone Pap smear testing as part of routine master health checkup at a tertiary care center in Tamil Nadu, during the second half of the year 2024. Their cervical cytology records were retrospectively reviewed. Records of 22 women with documented symptoms suggestive of cervical pathology were

excluded to focus on asymptomatic individuals undergoing screening as part of the full body checkup. Thus, the final sample size was 1081.

The overall sociodemographic and reproductive characteristics were extracted from the records of these 1081 women. The mean age of the women was 43 ± 6 years. Marital status distribution indicated that the vast majority, i.e., 79.8%, were living with their partners, 14.3% were separated, divorced, or widowed, and 5.9% were unmarried. None of the women were pregnant. Menopausal status, a crucial phase in cervical transformation was recorded in all cases, with 28.4% postmenopausal and 71.6% premenopausal. Parity records showed a mean of 2 children per woman, with 15.8% having had one childbirth and 6.8% being nulliparous. Additionally, a history of abortion was documented in 32.5% of the records, providing further insights into the reproductive health landscape of the study population.

The findings revealed a significant prevalence of various comorbidities within the study group; More than half 51.2% (553) of women who records were reviewed, had diabetes mellitus; around one fifth i.e. 21.8% (236) were hypothyroid, 20.3% (219) were hypertensive, and 8.6% (93) had bronchial asthma. Ultrasonographic findings were for all women were available, and 16.74% (181) had identifiable uterine or ovarian pathologies despite having no symptoms related to them.

The final reports based were categories based on Bethesda system. Among the 1081 asymptomatic women who had undergone Pap smear testing, 8.7% (95) were found to be unsatisfactory, 6.01% (65) had neoplastic changes, and 85.29 % (921), were categorized as Negative for Intraepithelial Lesion or Malignancy (NILM) [Figure 1].

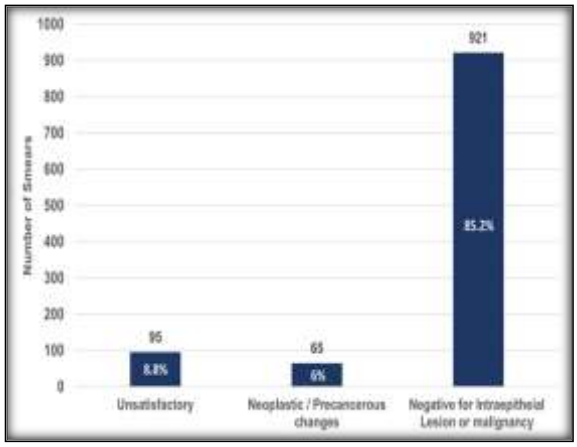

Figure 1: Major category of Pap smear findings (n=921)

Among the smears categorized as Negative for Intraepithelial Lesion or Malignancy (NILM) i.e. 921 smears, 'No additional changes' were reported in 28%. Bacterial vaginosis was the most the most common infection, found in 21.8% of smears. Candida species followed in second place, detected in 18.8% of Pap smears [Table 1].

Table 1: Classifications of NILM-Associated Cytological Features

NILM-Associated Cytological Features	Frequency (n)	Percentage (%)
No additional changes	258	28.0
Bacterial vaginosis	201	21.8
Candidiasis	173	18.8
Inflammatory smear	153	16.7
Other infections (e.g., Trichomonas, Actinomyces, HSV)	119	12.9
Atrophic smear	17	1.8

Among the infections, apart from Bacterial vaginosis (18.8%) and Candida infection (19.8%), the other organisms identified were Trichomonas vaginalis, Actinomyces spp., and Herpes simplex virus. The most commonly identified epithelial cell abnormality suggestive of neoplastic or precancerous lesion in the reviewed Pap smear records was Low-Grade Squamous Intraepithelial Lesion (LSIL), accounting for 56.9% (37) of the abnormal findings. This was followed by Atypical Squamous Cells of Undetermined Significance (ASC-US), observed in 20% (13) of cases, and High-Grade Squamous Intraepithelial Lesion (HSIL), seen in 17% (11). The least common finding was Squamous Cell Carcinoma (SCC), which was present in 6.1% (4) of the neoplastic or precancerous cases [Figure 2].

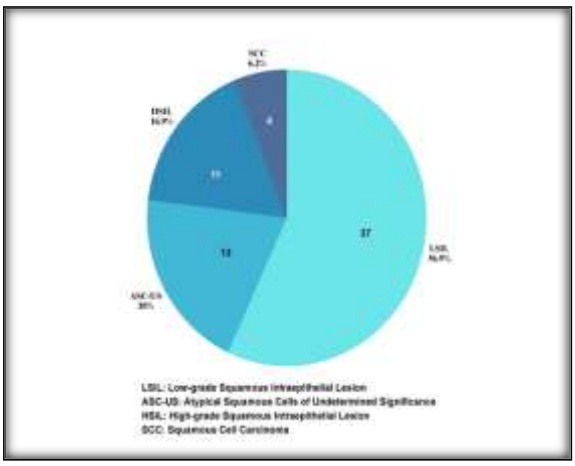

Figure 2: Epithelial cell abnormalities. (The distribution of types among the 65 smears where epithelial cell abnormalities were identified)

DISCUSSION

The present study was done using the records of 1081 asymptomatic women who had undergone an incidental Pap screening as part of a master health checkup. One of the major reasons for poor utilization of cervical screening, particularly among those who know about it, was the perceived low risk of cancer.[10] We wanted to know about the chance of a woman who are postponing screening (believing herself to be at low risk) having cervical cancer. Hence included only reports of women who had reported to the Master Health checkup counter, rather than the Gynecological department and also excluded those who had some complaints that suggests Cervical pathology.

Among the 1081 Pap smear included in our study, majority fell in the category of NILM (85. 2%). Neoplastic or paraneoplastic changes were reported in 65 samples, i.e. 6% of smears had neoplastic changes. Community based studies by Suma et al,[11] Sunkavli et al,[12] & Vidhubala et al,[13] among all women including those with gynecological complaints, reported that 2.1, 3% & 3.9% smears respectively, showed epithelial cell abnormalities. Hospital based studies by Singh et al,[14] and Justa et al,[15] also found epithelial changes to be at 2.5% and 1.5% respectively. On the other hand, studies done by Umarani et al,[16] Vedavathi et al,[17] & Nair et al[18] at various tertiary care centers in across India, had a relatively high percentage of abnormal smears. i.e. 8.5% & 7.2% respectively, similar to our study. However, most of these studies were done among women who came to gynecological OPD with some complaints. The comparatively high percentage of abnormal findings in asymptomatic women suggests that opportunistic screening for Cervical cancer among women visiting gynecological department or clinic is inadequate and there might be a significant percentage of women in the community who missed and who end of in the hospital at a later stage of the disease. Also, gynecological problems cannot be trusted to point out diseased individuals and screening of all women in the high-risk age group is a must.

In our study, 16.7% of the smears among NILM, were inflammatory without infection. This finding was similar to the finding reported by Nair et al,[18] & Vedavathi et al.[17] However, in studies by Agarwal et al,[19] Justa et al,[15] & Majumdar and Chakma,[20] approximately half the smears were inflammatory without infection. Bacterial vaginosis was the most frequently infection detected; present in 18.8% of smears. Candida species followed. Similar high percentage of Bacterial vaginosis was reported by Inaniya et al.[21] Other studies like those by Agarwal et al, Nair et al, Majumdar & Chakma etc. reports a lower percentage of Vaginosis,[18,20,22] but it's still the post common infection reported in these studies.

In our study, the most common abnormal epithelial finding was Low-Grade Squamous Intraepithelial Lesion (LSIL), followed by ASC-US, HSIL and SCC. Most similar studies have report, LSIL or ASC-US as the first or second most common finding among epithelial abnormalities. The overall percentages of abnormal epithelial finding are slightly higher comparative to those of similar studies except for the studies by Majumdar and Chakma & Umarani et al. [Table 2]

Table 2: Epithelial cell abnormalities compared to similar studies

Study	Study setting	State	Sample	Epithelial abnormality	SCC	LSIL	HSIL	ASCUS
				(in percentages)				
Our study	Hospital (asymptomatic)	Tamil Nadu	1081	6.01	0.37	3.42	1.02	1.20
Singh et al [14]	Hospital	Telangana	752	2.53	0.13	1.33	0.13	0.93
Tailor et al [23]	Hospital	Gujarat	1425	1.19	0.28	0.00	0.14	0.77
Justa et al [15]	Hospital	Himachal Pradesh	2139	1.59	0.05	0.23	0.19	1.12
Majumdar and Chakma [20]	Hospital	Tripura	600	18	2.33	6.67	5.17	3.83
Vidhubala et al [24]	Community	Tamil Nadu	2192	4.56	0.05	0.64	0.64	3.24
Mohan & Karthika [25]	Community	Kerala	5241	4.83	0.17	2.18	0.46	2.02
Suma et al [11]	Community	Karnataka	357	1.96	-	0.56	1.12	0.28
Umarani at al [16]	Hospital	Karnataka	1,418	7.4	0.28	1.62	0.63	4.87
Annaiya et al [21]	Hospital	Gujarat	3,871	0.41	-	0.03	0.05	0.34

CONCLUSION

The study revealed that the prevalence of epithelial abnormality among the Pap smear was slightly higher compared to most of the similar studies done in various parts of the country, despite excluding symptomatic patients from the study. The prevalence of infective organisms was also high in these asymptomatic women, suggesting that Pap smear might have an additional role in identifying infections at an earlier stage. Our study also found comparatively higher percentage of Squamous cell carcinoma. These finding suggest that waiting for women to come to gynecological department and do an opportunistic screening is not enough. Community based periodic cervical cancer screening, at least with a Pap smear test should be provided as an accessible & acceptable service (similar to screening for

Diabetes and hypertension in adults), and it should be preceded with targeted health education campaign. This in combination with the HPV vaccination would be more likely to bring down the incidence of cervical cancer in the country.

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