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A STUDY OF CERVICAL CYTOLOGY IN PAP SMEARS IN A TERTIARY CARE HOSPITAL IN NORTHEAST INDIA

Obstetrics & Gynaecology

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ABSTRACT

Background: Cervical cancer is the fourth leading cause of death in females worldwide. 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 stage with adequate and repetitive cytological screening by Papanicolaou (Pap) smears. Aim of this study was to study the role of Pap smear in detecting premalignant and malignant lesions as well as non-neoplastic lesions of cervix. **Methods:** It is a retrospective study of 1000 pap smears studied from January 2022 to November 2023 in department of obstetrics and gynaecology of a tertiary care hospital of Manipur. Samples were collected from women above 21 years presenting with some gynecological problems and smears were reported as per the 2014 Bethesda system. **Results:** Out of 1000 women, 870 were having normal cytology and 561 cases with inflammatory changes. 60 cases were unsatisfactory. 43 cases of ASCUS, 15 cases of LSIL, 05 cases of HSIL and 07 cases of SCC were observed. **Conclusions:** Pap smear test is a simple, safe, noninvasive, economical OPD based procedure to detect preinvasive cervical epithelial lesions. Every woman should undergo Pap test at least once in her life before the age of 45 years.

KEYWORDS

Cervical cancer, Pap smear, Screening, Premalignant lesion

INTRODUCTION

Cervical cancer is an important health problem and leading cause of morbidity and mortality amongst women globally.[1] According to national cancer registry programme of India cancers of uterine cervix and breast are leading malignancies seen in Indian women.[2] As per GLOBOCAN 2020 statistics, 1,23,907 new cases were diagnosed and 77,348 lost their lives in India alone.[3] The data published in WHO—Cervical Cancer Country Profiles estimates that fewer than one in ten women have been screened in India in past 5 years, averaging the screening rates to be less than 2%.[4] Cervical cancer is a preventable disease due to the long pre-invasive stage.

Early detection and appropriate treatment are possible if robust screening is implemented. Risk factors for the cervical cancer include early age of first pregnancy, multiple sexual partners, cigarette smoking, exposure to human papilloma virus, immunosuppression, early onset of sexual activity, human immunodeficiency virus or neoplasia of vulva or vagina.[5] Early cervical epithelial changes can be identified by a Pap smear test, which is the primary screening test for detection of precancerous cervical intraepithelial neoplasia and the early stage of invasive cervical cancer.[6]

Pap smear as a screening procedure was first invented by Greek doctor Georgios Papanikolaou. The test is performed by opening the vaginal canal with Cusco's speculum and collecting cells at the outer opening of the cervix i.e. at the transformation zone, and endocervical canal. Then the collected cells are examined under a microscope.[7] Women should start having screening at age 21, regardless of age when they first start having sex. Women who are 21 to 29 should have a Pap test alone every 3 years. HPV testing alone can be considered for women who are 25 to 29, but Pap tests are preferred. Women who are 30 to 65 have three options for testing, they can have a Pap test and an HPV test (co-testing) every 5 years or they can have a Pap test alone every 3 years or they can have HPV testing alone every 5 years.[8]

Bethesda system of reporting has been introduced to classify the lesions into low and high grade intraepithelial lesions it provides uniform system of terminology which makes management and treatment simple.[9] Two main vaccines are available Gardasil- protects against 6, 11, 16, 18 given to women of age 9-26 years. Cervarix protect against 16 and 18 which mainly causes cervical cancer. But vaccine related lesions are common in women with HPV infections. So gold standard for early detection and better prognosis of cervical cancer is screening with Pap smear.[10]

METHODS

The study is a 23 months retrospective observational study conducted in Department of Obstetrics and Gynaecology of a tertiary care hospital of Manipur to evaluate all the pap smears reported during January 2022 to November 2023. The patients were instructed by the gynecologists prior to the procedure to avoid coitus, use of local douching and antiseptics before the cytological examination. Patients were placed in the lithotomy position, and a sterile bivalve speculum was inserted into the vagina.

The posterior vaginal wall was retracted posteriorly and the anterior vaginal wall anteriorly to allow proper visualization of the cervix and vaginal wall. After per speculum examination of the patient, the longer projection of Ayre's spatula was inserted in cervix near squamo-columnar junction and rotated through 360^0. The cytological smears were taken by gynecologists for routine screening by conventional method.

All the slides were labelled immediately and dipped in 95% ethyl alcohol jars. Pap staining was done by trained cytotechnologists followed by light microscopy and slide interpretation by cytopathologists.

Inclusion Criteria:

All sexually active women coming to gynaecology department in the age group from 21 to 65 years with the complaints of vaginal discharge, intermenstrual bleeding, postmenopausal bleeding,

abdominal pain, irregular menses and something coming out of vagina and who consented for Pap smear test were included in the 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 local antiseptic, women with menstrual bleeding, cervical growths and who were not willing to do the Pap test were all excluded from the study.

The conditions interfere with cytological examination are improper fixation or drying of a smear before fixation, failure to obtain adequate cellular sample, excessive use of lubricating jelly on the vaginal speculum, excessive mucus, blood, or purulent exudates.

Statistical Analysis:
Data was entered in Excel sheet and using Microsoft word

RESULTS

This study was conducted at a tertiary care hospital in Manipur. Study includes participation of 1000 women. Demographic data like age, marital status, parity was noted and tabulated in Table 1.

Table 1: Socio Demographic Data Of The Study Participants

Socio-demographic Characteristics		Frequency	Percentage
Age group(years)	21-30	57	5.7
	31-40	232	23.2
	41-50	434	43.4
	51-60	193	19.3
	Above 60	84	8.4
Parity Distribution	Nullipara	44	4.4
	Primipara	97	9.7
	Multipara	859	85.9
Marital status	Married	1000	100

Highest number of participants (434-43.4%) were in the age group of 41-50 years, followed by 31-40 years (232- 23.2%) and least number of participants (57-5.7%) were in the age group of 21-30 years. The mean age of the study population is 45.82 years. Out of 1000 women, 956 (95.6%) were parous and 44 women (4.4%) were nulliparous. All the participants were married. Most of the women were of low socioeconomic strata.

None of the women who participated in the study had Pap smear testing earlier in their life. 172 women (17.20%) knew that there are tests available that can detect the cancer of the cervix. But none knew about the test that can detect the precancerous lesions. In our study 662 (66.20%) had vaginal discharge, 149 (14.90%) had irregular menses, 84 (8.4%) were asymptomatic, 34 (3.40%) had pain in abdomen, 21 (2.10%) had urinary problems, 17 (1.70%) had post menopausal bleeding, 17 (1.70%) had complain of something coming out of vagina, 10 (1.00%) had dyspareunia and 06 (0.60%) had post coital bleeding (Table 2).

Table 2: Chief Complaints Of The Study Participants

Chief complaint	Number	Percentage
White discharge	662	66.20
Irregular menses	149	14.90
Asymptomatic	84	8.40
Pain abdomen	34	3.40
Urinary problems	21	2.10
Post menopausal bleeding	17	1.70
Something coming out of vagina	17	1.70
Dyspareunia	10	1.00
Post coital bleeding	6	0.60
Total	1000	100

All the participants were categorized into different groups depending on their age. Group 1 consists of participants aged between 21-30 years, group 2 consists of participants aged between 31-40 years, Group 3 consists of participants ranged between 41-50 years, Group 4 consists of 51-60 years and Group 5 consist of females above 60 years age.

Table 3: Spectrum Of Cytodiagnosis On Pap Smear Reporting By Bethesda System 2014 Of The Study Participants

Pap smear diagnosis	Number	Percentage
Unsatisfactory	60	06.00
NILM	870	87.00
A) Inflammatory	561	56.10
A. Non specific	428	42.80
B. Candida	66	06.60
C. Bacterial vaginosis	56	05.60
D. Trichomonas vaginalis	11	01.10
B) Atrophic smear	69	06.9
C) No other changes	240	24.00
Epithelial Cell Abnormalities	70	07.00
A) ASCUS	43	04.30
B) LSIL	15	01.50
C) HSIL	05	00.50
D) SCC	07	00.70

Out of 1000 cases, 60 cases (06.00 %) were unsatisfactory for evaluation, 870 cases (87%) were reported as negative for intraepithelial lesion/malignancy and 70 cases (7.00%) had epithelial cell abnormality (Table 3). In cases with negative for intraepithelial lesions, 561 cases (56.10%) were inflammatory, 240 cases (24.00%) showed no other changes and 69 cases (06.90%) were atrophic smears. In inflammatory cases 133 cases (13.3%) showed presence of microorganisms.

Among 70 of intraepithelial lesions - 43 (04.30%) were ASCUS, 15 cases (01.50%) were LSIL, 5 cases (0.50%) were HSIL and 7 cases (0.70%) were of squamous cell carcinoma cervix. Most common age group showing epithelial cell abnormality was 41-50 years of age. Out of 43 cases (4.30%) of ASCUS, 15 were in the age group of 41-50 years, 06 cases (2.60%) of LSIL were maximum in the age range 41-50 yrs. 3 cases of HSIL were in the age group of above 60 years and 5 cases of squamous cell carcinoma cervix was in the age group of 41-50yrs. The most frequent epithelial abnormality was ASCUS. The mean age of ASCUS was 54 years, LSIL was 53 years, 59 years for HSIL and 50 years for carcinoma cervix (Table 4).

Table 4: Cervical Epithelial Cell Abnormalities In Relation To Age Of The Study Participants

Age group (years)	ASCUS (%)	LSIL (%)	HSIL (%)	SCC (%)	%
21-30	0	0	0	0	
31-40	4	0	0	0	5.72
41-50	15	6	1	5	38.57
51-60	10	7	1	1	27.14
>60	14	2	3	1	28.57
Total	43 (61.43)	15 (21.43)	5 (7.14)	7 (10)	70 (100)

DISCUSSION

Cancers of the uterine cervix are among the leading malignancies in Indian women. Cervical cancer is considered an ideal gynecological malignancy for screening due to its long latent phase before invasive disease develops.[11,12] It is well-established that the burden of cervical cancer has been significantly reduced following the introduction of screening programmes.[13] To evaluate the effectiveness of these screening tests and to plan strategic programmes, objective data from various hospital studies are essential. This is where our study, conducted at a tertiary care hospital in Manipur, becomes important, as there are limited published data on the patterns of epithelial cell abnormalities in Pap smears in this region.

The mean age of the participants in our study was 45.82 ± 9.08 years. This average age is appropriate given that cervical cancer commonly develops between 40 and 50 years of age, with precursor lesions typically appearing 5-10 years earlier. It is recommended that women have at least one smear test before the age of 45 years. Those who have their first smear after this age may miss the opportunity for cancer prevention all together.[14]

In our study, the majority of patients were in their forties (43.40%), followed by those in their thirties (23.20%). Similar findings were reported by Verma et al. (2016), Vedvathi et al. (2019), and Vijaya et al. (2021).[12,14,15] This indicates that many women in India still experience significant delays in undergoing Pap smear cytology. Healthcare professionals should request Pap smear testing and educate women about its benefits. In our study, most women had their first Pap test during this research, and none were aware that cervical cancer could be detected in a precancerous state through a Pap test.

Most women in our study were multiparous and uneducated. A study

by Abraham et al. reported that women with higher education levels and better access to healthcare services were more likely to seek treatment for gynecological symptoms at earlier stages, resulting in reduced prevalence of gynecological morbidities.[16] Our study participants were a vulnerable population with low literacy levels, low socioeconomic status, and distinct socio-cultural practices such as early marriage and pregnancy. These factors may have contributed to the higher proportion of symptoms indicative of gynecological morbidities among these women.

Table 6: Studies Comparing Prevalence Of Epithelial Abnormalities In The Study Participants.

Author	Year	Place	No. of cases	Total prevalence(%)	ASCUS (%)	LSIL (%)	HSIL (%)	SCC (%)
Nair et al	2016	Kerala	2028	2.42	0.15	1.58	0.49	0.20
Arul Anne	2016	T.N	630	3.8	0.9	0.5	0.6	0.8
Verma et al	2017	H.P	200	9.0	1.0	5.5	2.5	0
Sarala et al	2017	T.S	1000	1.2	0.6	0.2	0.3	0.1
Pushplata et al	2018	U.P	1650	8.48	2.9	5.09	0.48	0
Sharma et al	2018	U.P	450	6.9	3.3	1.2	0.4	0.2
Jadhav et al	2019	Gujarat	487	1.23	0.20	0.20	0.41	0.41
Vedvathi et al	2019	Karnataka	200	9.0	4.0	3.5	1.0	0
Laxmi et al	2020	Rajasthan	576	10.06	4.94	1.33	0.48	0.24
Majumdar et al	2020	Tripura	600	9.0	3.8	6.7	5.2	2.3
Sakshi et al	2023	Maharashtra	240	5.83	2.17	2.60	0.86	0.43
Saurabh S et al	2023	Bihar	200	15.0	6.0	5.0	3.5	0.5
Present study	2024	Manipur	1000	7.00	4.30	1.50	0.50	0.70

The most common presenting complaint in our study was white discharge, followed by irregular menses. This finding is consistent with other studies by Manjit et al. (2012), Pushplata et al. (2018), Singh et al. (2018), and Agrawal S et al. (2023).[17,18,11,23] Of the 1000 smears collected, 60 (6.00%) were unsatisfactory for evaluation due to factors such as scant cellularity, inflammation, and hemorrhagic background. Supriti et al. reported a 2.3% rate of unsatisfactory smears in her study.[21] Proper sampling and transportation of slides to the cytopathology laboratory are recommended for better cellularity.

In our study, inflammatory smears comprised 56.10%, a finding comparable with studies by, Laxmi et al (2020), Manjit et al. (2012), Manan et al. (2019), and Agrawal S et al. (2023), which reported inflammatory smears at 69%, 71.3%, 54%, and 60.83%, respectively.[27,17,20,23] Non-specific inflammation was present in 42.80% of our cases, compared to 97% and 85% in studies by Umarani et al. (2015) and Honey et al. (2018), respectively.[19,24]

Among specific inflammation causes, vaginal candidiasis was the leading one in our study, while bacterial vaginosis was most common in studies by Geethu et al. (2016), Honey et al. (2018), and Majumdar et al. (2020).[28,24,22] Candidiasis was observed in 5.41% of smears, with rates ranging between 0.34% and 6.26% in different studies. We found only 1.10% cases of trichomonas vaginalis and no cases of herpes, consistent with the rarity of these infections in most studies.

When analyzing the smears, 87% were negative for intraepithelial lesions or malignancy, and 7.00% were classified as epithelial lesions, which was comparable to the study of Arul Anne (2016) who in her study found 93.4% NILM cases and 6.6% epithelial lesions.[25]

In our study, ASC-US, LSIL, HSIL, and squamous cell carcinoma were found in 4.30%, 1.50%, 0.50%, and 0.70% of cases, respectively. Most ASCUS cases were in women aged 41-50 years, and five cases of SCC were in the same age group. LSIL was seen in women aged 40 to 60 years, and HSIL in women over 40 years. The prevalence of epithelial cell abnormalities varied between 1.2% and 10.06% in various studies, with our study reporting a prevalence of 7.00%, which aligns with these findings. The prevalence of LSIL, HSIL, and SCC in our study is comparable to other studies.

In the age group of 21-40 years, most PAP smears showed no epithelial cell abnormality, similar to findings by Agrawal S et al. (2023).[23] HSIL was most common among women over 40 years, indicating that multiparity (>3) is a significant risk factor for cervical carcinoma.

Our study has a few important limitations. Being a retrospective study, the eventual outcomes of all patients could not be determined, and no consistent disease pattern could be established. The use of liquid-based cytology methods might reduce the number of unsatisfactory smears, but these methods are not cost-effective in our setting. The sensitivity of the Pap smear test could have been improved if co-testing with HPV DNA and serial Pap smears had been conducted according to recommendations. All abnormal Pap smears should be followed up with colposcopy-guided biopsies. The Pap smear has certain limitations, including a false-negative rate of 20.9% and a sensitivity rate of only 37-84% for CIN 1 or higher.[26] It is also subject to subjective interpretation and has a low predictive value. The notification of results to women and the required visits for serial cytological screening also pose programmatic and logistic challenges.

CONCLUSION

Our study underscores the critical need for and importance of cervical screening. It directs and offers a foundation for further research aimed at the early detection of cervical cancer. The primary goal of the Pap smear screening process is to identify women with precancerous lesions, enabling treatment before these lesions progress to potentially lethal invasive cancer. The Pap smear is a highly valuable screening tool, widely utilized as a routine test that allows for early-stage intervention by detecting initial cervical changes.

Although our study was limited to a small region of our country, the results highlight the necessity of encouraging and motivating women to participate actively in screening programs. It is essential to make screening a continuous process to prevent individuals from discontinuing follow-up visits and treatment procedures. To achieve this, screening programs should be established, and data collection on screening should be improved. Additionally, protocols for patient follow-up should be developed, and guidelines for patient referrals should be identified. Implementing these measures will undoubtedly reduce the morbidity and mortality associated with cervical cancer in the near future.

Considering the presence of women who have never undergone a Pap test, it is crucial to educate the community about the Pap smear test, including its purpose and the recommended frequency of application. This education should be disseminated through widespread educational activities and media programs. We propose that larger studies are necessary to estimate the pattern of cervical cytological abnormalities and to detect common HPV strains in our area. This knowledge will be invaluable for preventing HPV infection, either through vaccines or future targeted therapies.

To effectively combat cervical cancer, we must strengthen our health services to expand cervical cancer screening programs and educate and motivate women to visit hospitals for cancer screening. While Pap smears are extensively recommended for cervical cancer screening, their preventive power lies in regular, serial screening. Therefore, it is imperative to ensure consistent and ongoing participation in screening programs to maximize their efficacy in reducing the incidence and impact of cervical cancer.

REFERENCES

1. Singh N, Gehlot H. A study of cervical cytology in females above 21 years of age. Int J Reprod Contracept Obstet Gynecol. 2019;8:3578-83.
2. National Cancer registry programme. Annual report 2021. Available at: https://ncdirindia.org/ NCRPAreports.aspx. Acceded on 15 June, 2023.
3. Sung H, Ferlay J, Siegel RL, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2021;71(03):209–249.
4. World Health Organization - Cervical Cancer Country Profiles. 2021. Accessed February 15, 2023 at: https://www.who.int/teams/noncommunicable-diseases/surveillance/data/cervical-cancer-profiles
5. Proca DM, Rofagha 5, Keyhani-Rofagha S. High grade squamous intraepithelial lesion in inmates from Ohio: cervical screening and biopsy follow-up. Cyto J. 2006;3:15.
6. Bal MS, Goyal R, Suri AK, Mohi MK. Detection of abnormal cervical cytology in papanicolaou smears. J Cytol 2012;29:45-7.

7. Monica Idestrom, Ian M, Agneta AE. Women's experience of coping with a positive Pap smear: a register-based study of women with two consecutive pap smears reported as CIN1. Acta Obstet Gynecol Scand. 2003;82(8):756-61.
8. The American College of Obstetricians and Gynecologists guidelines at: https://www.acog.org/womens-health/infographics/cervical-cancer-screening
9. Pradhan B, Pradhan SB, Mittal VP. Correlation of Pap smear findings with clinical findings and cervical biopsy. Kathmandu Univ Med. 2007;5(4):461-7.
10. Basu M. The relevance of cervical cancer screening and the future of cervical cancer control in India in the light of the approval of the vaccine against cervical cancer. Indian J Cancer. 2006;43:139.
11. Singh AN, Sukhavasi C. Prevalence and analysis of abnormal Pap smear: Prospective study of 752 patients in a tertiary care hospital of South India. Obs Rev J obstet Gynecol. 2018;4(3):67-72.
12. Vedavathi V, Anusuya SK, Parimala BS. Analysis of cervical cytology using PAP smear in women residing in Bangalore Rural, India. J. Evid. Based Med. Healthc. 2019;6(51):3156-9.
13. Tailor HJ, Patel RD, Patel PR, Bhagat VM. Study of cervical pap smears in a tertiary care hospital of South Gujarat, India. Int J Res Med Sci. 2016;4:286-8.
14. Verma A, Verma S, Vashist S, Attri S, Singhal A. A study on cervical cancer screening in symptomatic women using Pap smear in a tertiary care hospital in rural area of Himachal Pradesh, India. Middle East Fert Soci J. 2017;22(1):39-42.
15. Karra V, Ramulu PS, Rajanikar, Sudhakar B. Cervical pap smear study and its utility in cervical cancer detection and prevention. Indian J Obstet Gynecol Res. 2021;8(4):470-5.
16. Abraham A, Varghese S, Satheesh M, Vijayakumar K, Gopakumar S, Mendez AM. Pattern of gynecological morbidity, its factors and Health seeking behavior among reproductive age group women in a rural community of Thiruvananthapuram district, South Kerala. Ind J Comm Health. 2014:26(3):230-7.
17. Bal MS, Goyal R, Suri AK, Mohi MK. Detection of abnormal cervical cytology in Papanicolaou smears. J Cytol. 2012;29:45-7.
18. Sachan PL, Singh M, Patel ML, Sachan R. A study on cervical cancer screening using pap smear test and clinical correlation. Asia Pac J Oncol Nurs. 2018;5:337-41.
19. Umarani MK, Gayathri MN, Madhu Kumar. Study of cervical cytology in Papanicolaou (Pap) smears in a tertiary care hospital. Indi J Pathol Oncol. 2016;3(4):679-83.
20. Jadav MP, Patel FT, Shah BA, Parikh NR, Gonsai RN. A study of cervical pap smears in a tertiary care hospital of Ahmedabad, Gujarat, India. Inter J Clinical Diag Pathol. 2019;2(2):74-8.
21. Ghosh S, Pattanshetty SM, Mallya SD, Pandey D, Guddattu V, Kamath VG, et al. Cervical cytology and associated factors among tribal women of Karnataka, India. PLoS ONE. 2021;16(3):e0248963.
22. Majumder N, Chakma S. A case study of 600 cervical pap smears in a tertiary hospital of northeast India in a Hilly State of Tripura. Ann Int Med Den Res. 2020;6(5):PT05-7.
23. Agrawal S, Agrawal S, Gupta P. Study of cervical cytology in pap smears in a tertiary care hospital of North Maharashtra. Int J Reprod Contracept Obstet Gynecol 2023;12:2185-91.
24. Raju K. Evolution of Pap Stain. Biomed Res Ther. 2016;3(2):490-500.
25. Rose AAS. Pattern of Pap smear cytology: our experience. Int J Reprod Contracept Obstet Gynecol. 2016;5(10):3290-3.
26. Sarala K, Nalini Y, Prathyusha Y, Sandhya G. A retrospective study of thousand PAP smears at tertiary care center. Int J Contemp Med Res. 2017;4(12):7-10.
27. Salodia L, Sharma M, Sharma R. Analysis of abnormal cervical cytology and its clinicopathological correlation in papanicolaou smears at tertiary care center - a prospective observational study. MedPulse Int J Gynaeco. 2020;13(2):69-74.
28. Nair GG, Shamsuddin F, Narayanan T, Balan P. Cytopathological pattern of cervical pap smears-a study among population of North Malabar in Kerala. Ind J of Pathol and Onco. 2016;3(4):552-7.