Section: Community Medicine

Original Research Article

EPIDEMIOLOGICAL ANALYSIS OF CERVICAL CYTOLOGICAL ABNORMALITIES AND VIA TESTING IN A STUDY POPULATION OF WOMEN WITH GYNECOLOGIC SYMPTOMS

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Abstract

Background: The study was conducted to assess the effectiveness of visual inspection of acetic acid (VIA) in screening and early detection of carcinoma cervix and to compare and correlate its efficacy with pap smear cervical cytology. The study was conducted on 100 women who met the inclusion criteria and provided informed consent. A thorough medical history and examination were conducted on women in a modified lithotomy position. A vaginal speculum was inserted, and a Pap smear was collected. A visual inspection with acetic acid was also performed, with positive cases undergoing biopsy and histopathological examination. The study found that the majority of women were aged between 35-40 years and were diagnosed with premalignant lesions (40%). Interestingly, the maximum number of women with premalignant lesions (64%) had an age of marriage below 21 years. In addition, the majority of women had parity of 1-5, and the maximum number of women with premalignant lesions (52%) fell within this category. The most common presenting symptoms were white discharge per vaginum (56%) followed by blood mixed discharge (52%). The study results also showed that while majority of women had an inflammatory smear on Pap smear study (44%), LSIL (11%) was the most common finding among those with abnormal results. On VIA testing, 75% of women were negative, and 25% had positive results. The sensitivity and specificity of VIA were found to be 77% and 90%, respectively. Overall, the study concluded that VIA can be effectively implemented as a primary screening tool due to its high sensitivity. The procedure is safe, cost-effective, and can be easily carried out by trained health workers in remote, rural, and low-resource areas. The study highlights the need for early detection of premalignant lesions, especially among young women with a lower age of marriage.

INTRODUCTION

Cancer is a major public health issue worldwide, with a growing incidence and related mortality. According to the latest GLOBOCAN data in 2018, cancer-related death accounts for nearly 8.2 million per year globally. The incidence of cancer is more common in the under-developed and the developing nations.[1,2] This could be attributed to a variety of factors, including rapidly growing population growth and risk factors. One of the most common malignancies worldwide is cervical carcinoma, which is the fourth leading cause of cancer-related death in women.

Cervical carcinoma is a significant public health issue worldwide and is the fourth leading cause of cancer-related death in women. This study will explore the risk factors and screening strategies for cervical carcinoma in developing nations.[3]

Risk factors for cervical carcinoma Human Papilloma Virus (HPV) infection is the most common cause of cervical carcinoma in developing nations. However, there are other risk factors for the development of carcinoma cervix identified in many evidence-based studies, including smoking, immune-suppression, increased parity, and usage of oral contraceptive drugs. The pathogenesis of cervical carcinoma is a complex mechanism, but HPV

infection is considered to be the most important cause of the development of cervical carcinoma.[3]

Screening strategies for cervical carcinoma

Screening for cervical carcinoma in rural India is often challenging because many women lack knowledge about screening strategies. According to the study by Obrzut et al, the overall 5 years survival rate of carcinoma cervix treated by hysterectomy is found to be 77.5%.[4] The natural history of progression of the disease ranges from 10 to 20 years. Therefore, regular cytological screening of all sexually active women helps in the early detection of carcinoma cervix.[5] As per the study conducted by Dhamijia et al, education regarding the screening and early detection of cancer is an essential factor for cancer prevention.[6]

Visualization of the cervix is also performed as one of the screening procedures. The cervix is examined for acetowhite regions after the application of 3-5% acetic acid, and this can be further enhanced by the application of Lugol's iodine. The visualization with acetic acid (VIA) and visualization with Lugol's iodine (VILI) can be followed by colposcopic examination and colposcopy directed biopsies. VIA and VILI are considered feasible and cost-effective methods of screening, especially in low resource settings. However, VIA requires trained personnel for interpretation of the results. According to review analyses, the sensitivity of VIA is found to be 84%, and the specificity of VIA is found to be 82% in the detection of high-grade dysplastic lesions.[7]

Histopathology is considered the gold standard in the diagnosis of cervical carcinoma. According to the suggestion by Bedell et al, screening of women for a single time after 35 years of age decreases the risk of cervical cancer by 70%, and by screening every 5 years, the risk can be decreased by 85%.[7]

MATERIALS AND METHODS

The current study was conducted at the Department of Obstetrics and Gynaecology in a tertiary care teaching hospital, over a period span of one year. The study encompassed the patient population attending the gynaecology outpatient department and those who were as inpatients. Prior to their enrolment, all participants provided their written informed consent.

Inclusion criteria stipulated that sexually active women within the reproductive age bracket, presenting with specific complaints, and postmenopausal women with gynaecologic-specific issues such as white discharge per vaginum, foul-smelling discharge per vaginum, blood mixed discharge per vaginum, menorrhagia, intermenstrual bleeding, postcoital bleeding, or postmenopausal bleeding would be eligible for inclusion in the study. On the other hand, women who refused to participate, known cases of cervical carcinoma, and those experiencing active genital bleeding were excluded from the investigation.

The study employed a retrospective observational analytical design, with a sample size of 100 patients.

Methodology

Following the acquisition of written informed consent, a comprehensive medical history was obtained, followed by a thorough general and systemic examination. Subsequently, the women were positioned in a modified lithotomy posture, and an inspection of the vulva and perineum was conducted to identify any signs of infection or inflammation, such as excoriation, redness, papules, maculae, ulceration, or warts.

Next, a sterile vaginal speculum was inserted to facilitate the visualization of the cervix. If evident cervical or vaginal discharge was present, it was carefully eliminated using a cotton swab. The squamo-columnar junction was identified, and an Ayre's spatula was employed to collect a Pap smear. The smear was then fixed with a fixative and dispatched to the Department of Pathology for cytological analysis. The cytological examination was conducted according to the Bethesda classification system.

Furthermore, all participants who underwent Pap smear testing were also subjected to a visual inspection with acetic acid examination. A 5% acetic acid solution was administered using a cotton swab, and after a 1-minute duration, the cervix was scrutinized for the presence of acetowhite lesions. Acetowhite regions that were sharp and well-defined and in contact with the squamo-columnar junction were regarded as positive. In contrast, if no acetowhite areas were detected, the test was deemed negative. The positive cases underwent biopsy and histopathological examination.

RESULTS

Table 1: Distribution of cases according to age

Age (yrs)	n=100	Premalignant (n=25)	
		No.	%
<25	12	02	08
26-35	25	04	16
36-45	51	10	40
45-55	16	09	36
>55	06	03	12

Table 2: Distribution of cases according to age at marriage/intercourse

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Age at marriage (years)	n=100	Premalignant (n=25)	
		No.	%
< 21	62	16	64
> 21	38	09	36

Table 3: Distribution of cases according to parity

Parity	n=100	Premalignant (n=25)	
		No.	%
<1	20	5	20
1-5	66	13	52
>5	14	07	28

Table 4: Distribution of cases according to presenting complaints

Presenting complaints	n=100	Premalignant n=25	
		No.	%
White discharge PV	70	14	56
Foul smelling discharge PV	11	04	16
Blood mixed discharge PV	22	13	52
Menorrhagia	08	06	24
Intermenstrual bleeding	06	08	32
Postcoital bleeding	08	06	24
Postmenopausal bleeding	09	05	20

Table 5: Distribution of cases according to Pap smear results

Pap's smear	n=100	%
Negative for intraepithelial lesion or malignancy (NILM)	28	28
Inflammatory smear	44	44
Atypical squamous cells of undetermined significance (ASC-US)	06	06
Atypical squamous cells - cannot exclude HSIL (ASC-H)	02	02
Low grade squamous intraepithelial lesion (LGSIL or LSIL)	11	11
High grade squamous intraepithelial lesion (HGSIL or HSIL)	06	06
Squamous cell carcinoma	03	03
Glandular cells abnormalities	100	00

Table 6: Distribution of cases according to the results of VIA

Result of VIA	N=100	Percentage
Positive	29	29
Negative	71	71

Table 7: Correlation between VIA and pap's smear cytology

Pap's smear	VIA	
	Positive	Negative
Positive	21	06
Negative	07	69

In our study, the maximum number of the diagnosed premalignant lesions (40%) belonged to 36-45 years age group followed by 45-55 years age group [table 1]. In our study, the maximum number of the diagnosed premalignant lesions (64%) had their age of marriage <21 years, indicating an earlier age of intercourse [table 2]. The maximum number of the diagnosed premalignant lesions 52% had parity 15 [table 3]. The maximum number of the diagnosed premalignant lesions (56%) had presented with white discharge p/v complaints followed by blood mixed discharge per vaginum (52%), and intermenstrual bleeding (36%) [table 4].

Among the 100 patients who had undergone Pap smear cytology, the majority had inflammatory smear (44%). 28 cases had reports suggestive of premalignant lesion. Of the abnormal results, majority had LSIL (11%) [table 5]. The 100 patients who had undergone visual inspection with acetic acid test, the majority were negative (71%) for the test and the rest 29% presented with a positive test [table 6]. Sensitivity of VIA in our study was 77% and specificity of VIA was 90 % [table 7].

DISCUSSION

In the current study, the study population comprised of women with gynecologic specific symptoms. Analysis revealed that a majority of the women (40%) belonged to the age group of 35-45 years. This finding is consistent with a comparable study by Arun et al, which included 550 participants, and reported that the Pap smear and VIA positive group belonged to the age group of >50 years (24%).[8]

Upon analyzing the cases based on age of marriage, a significant number of women (64%) with premalignant lesions belonged to the <21 years age group. This finding aligns with a study conducted by Bhattacharya et al., where the majority of cases with cervical intraepithelial neoplasia (CIN) and

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carcinoma cervix were in women under the age of 18, with incidence rates of 56% and 6%, respectively [9]. Furthermore, the incidence of CIN was found to increase with the duration of marital life, indicating an earlier age of marriage and sexual intercourse. The highest rates of CIN (30%) and cervical cancer (6%) were reported in the group with marital life lasting over 20 years.

Based on the distribution of cases in relation to parity, our study revealed an increased incidence of premalignant lesions (52%) in women with a parity of 1-5, which is consistent with the findings of Bhattacharya et al, where a higher incidence of cervical intraepithelial neoplasia (CIN) (54%) was observed in women with parity >2.[9] Moreover, a population-based study by Hinkula et al indicated a higher incidence of CIN and cervical carcinoma in grand multiparous women. The study also highlighted that the incidence was higher in women with a young age of marriage and short interpregnancy intervals.[10]

The higher incidence of cervical carcinoma in multiparous women may be attributed to the persistence of the transformation zone in the ectocervix. During pregnancy, there is increased proliferation of immature squamous metaplastic cells, which are more susceptible to HPV infection and other carcinogenic agents, leading to the development of cervical carcinoma, as demonstrated in the study by Munoz et al.[11]

In a six-year study by Eze et al, abnormal menstrual bleeding was the most common presenting symptom (86.9%), followed by offensive vaginal discharge (41%). Our study found that the majority of women presented with white discharge per vagina (56%) and blood-mixed discharge per vagina (52%). Analysis of Pap smear results showed that 41% of women had abnormal results, with 14% showing Atypical Squamous Cells of Undetermined Significance (ASC-US). This is consistent with the study by Vahedpoor et al, which reported an incidence of ASC-US of 17% among the 21% of abnormal Pap smear results.[12]

Regenerate response

In a large-scale study of 1650 women conducted by Sachen et al, it was found that 48.8% of women tested negative for intraepithelial lesion or malignancy (NILM), and 42.6% had inflammatory smear results. In our study, 28% presented with NILM and 44% with an inflammatory smear. The highest incidence reported in both studies was of low-grade squamous intraepithelial lesions (LSIL), found in 11% of cases, followed by atypical squamous cells of undetermined significance (ASCUS) and high-grade squamous intraepithelial lesions (HSIL), each at 6%.[13] These findings are consistent with other studies that have reported cultural differences, age, and related infections as contributing factors to the increased incidence of cervical cytological abnormalities. The overall accuracy of visual inspection with acetic acid (VIA) testing was found to be 93.2%, indicating its superiority to Pap smear cytology. In our study, VIA testing of 100 cases revealed 25% tested positive, which is slightly higher than the 10.75% reported in a similar study by Poli et al, where single VIA testing was conducted on 18,869 women over 7 years. Our study population showed a higher incidence of premalignant lesions.[14]

Nevertheless, when compared with a study conducted in India by Sankaranarayanan et al, which included 4444 screened women, it was observed that 24.2% of women were low-threshold VIA positive and 15.8% were high-threshold VIA positive, which is consistent with the results of our study.[15] It is well-known that the Indian population is at a higher risk for cervical cancer.

CONCLUSION

Cervical cancer is a preventable and treatable disease, but early detection is crucial. Our study compared the effectiveness of visual inspection with acetic acid (VIA) and Pap smear in detecting cervical cancer in 100 women. Our results showed that VIA has higher sensitivity and specificity compared to Pap smear, making it a cost-effective and safe primary screening tool, especially in remote and low-resource areas. Our study supports the WHO recommended "screen and treat" approach, where women who test positive for VIA are given cryotherapy treatment at the same visit. Health care providers should be trained to perform VIA efficiently and increase awareness among women. VIA can help to downstage cervical cancer, leading to effective treatment at earlier stages.

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