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Visual Inspection with Acetic Acid (VIA) and Factors Associated with it for Cervical Cancer Screening in Nepal

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INTRODUCTION

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Abstract

Background: In Nepal, cervical cancer remains a significant public health issue. When combined with simple treatment methods for treating early cervical lesions, visual inspection of the cervix with acetic acid (VIA) is an effective, affordable screening test for cervical cancer. VIA is effective in many underdeveloped regions where it is challenging to maintain high-quality cytology programs. This study aims to detect the precancerous lesion in women having clinically unhealthy cervix by using the VIA test.

Methods: The study was carried out in five districts of Nepal i.e., Sindhuli, Jhapa, Mahottari, Bara, and Dhanusa. Applying the VIA test, qualified health workers opportunistically examined eligible women between the agesof 15 to 60. Also,a ring pessary was inserted, and pelvic organ prolapse was observed among patients. Women who tested positive in VIA underwent additional evaluation, and those who had cervical lesions received either cryotherapy in the screening clinic or were referred to a more advanced facility.

Results: Altogether, 6994 visual inspections of the cervix with VIA were done in five districts. Nearly half of the patients i.e. 47.26% VIA were done in the Bara district. Around one-fourth of the VIA i.e., 26.45% was done in the Sindhuli district. 11.60% VIA was

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done in the Mahottari district. In the Jhapa district, 10.64% VIA was done followed by 4.03% in Dhanusa. Among the total VIA being done, positive VIA was found in 259 (3.07%) patients. Nearly one-third i.e. 34.74% of the positive VIA was found in the Bara district and the least 2.3% of positive VIA was found in the Dhanusa district. 234 cryotherapy/ Thermo coagulation and a total of 117 referrals were done in five districts. Pelvic inflammatory disease (PID) was found among 3901 patients. A total of 579 ring pessary was inserted and a total of 1762 pelvic organ prolapsed (POP) was observed in the given five districts.

Conclusion: Even in rural areas that have limited resources, VIA administered by skilled female health professionals is a safe, reliable, and effective test that can save people from cervical cancer. These findings have significant implications for the effective provision of services in cervical screening programs in settings with limited resources.

Keywords: Cervical cancer screening; visual inspection with acetic acid (VIA); Cryotherapy

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Annually, there are five million new cases of cervical cancer discovered, resulting in 266,000 fatalities worldwide, with 80 percent of these deaths occurring in impoverished nations like Nepal22. Before turning into invasive cancer, it has a protracted precancerous period. In developed nations, routine screening programs have lowered mortality by more than 70% (2). There are several ways to screen for it, including colposcopy, Papanicolaou smear, liquid-based cytology, and the human papillomavirus deoxyribonucleic acid test (HPV DNA), visual inspection of the cervix with the administration of 5% VIA and with Lugol's iodine (VILI). Visual inspection with acetic acid is an easy and affordable examination that may be conducted by healthcare professionals of any level(3). Cervical cancer caused the death of almost 311,000 women annually, and more than 85% of these deaths took place in low- and middle-income nations(4). In impoverished nations like Nepal, cervical cancer is a risk to the general public's health. It is one of the primary causes of female cancer and the second most prevalent type of cancer among Nepalese women

between the ages of 15 and 44. In 2020, there will likely be 2,244 new cases of cervical cancer, and 1,493 people will pass away from it (5). Cervical cancer fatality rates were calculated as 19.3% (6). In low-resource contexts, VIA is an alternative technique that combines "screen and treatments" in a single visit. When screening, if atypical acetowhite lesions are found, the client can begin immediate treatment(7). Early cancer detection is possible through screening. because although pre-cancerous lesions require 15 to 20 years for cervical cancer to grow in women with healthy immune systems, the cure rate would indeed be high if treated at an early stage(8). The detection and treatment of pre-cancer lesions are more cost-effective methods of preventing cervical cancer in women under the age of 30. Early treatment can prevent up to 80% of cervical cancers(9).

The national screening guidelines for cervical cancer in Nepal were created in 2010 to reach a screening rate of at least 50% of the target group in women between the ages of 30 to 60 by 2015. The guideline promoted VIA as the principal screening technique in all healthcare settings, from primary to tertiary. The screening strategy's results and consequences, however, have yet not been made widely available. Most public primary health care providers do not routinely offer cancer screening and early diagnosis programs like Pap tests and VIA, and there is no ongoing national screening program. Cancer plans, monitoring, and surveillance have a hospital-based focus and have subnational coverage(10). The service providers at this tier, as well as in camp settings, are auxiliary nurse midwives (ANMs) who have received VIA training, staff nurses, the medical officer, and, if available, a gynecologist(11). A total of 12,444 consumers had cervical cancer screening with VIA in Eastern Nepal over three years from March 2012 to April 2015. The VIA positivity rate was 5.9%, while the repeat VIA positivity rate during follow-up at the end of the year was 1.2%. Over 98% had undergone their initial cervical cancer screening, and there were few complications after receiving cryotherapy. According to the study's recommendations, the facility should be scaled up to the community level and connected to an effective referral system (12).

MATERIALS AND METHODS

To conduct cervical screenings, eligible women between the ages of 15 to 60 were invited to cancer screening clinics in the five districts of Nepal i.e. Sindhuli, Jhapa, Mahottari, Bara, and Dhanusa. The screening was open to females who were not pregnant, had an intact uterus, had

no prior history of CIN or cancer, and was willing to participate. Women's self-help groups and local village leaders participated in group meetings and discussions led by trained female health professionals i.e., ANMs about cervical screening in the communities. On mutually agreeable dates, screening camps were set up in village or community centers. After a thorough explanation of the test and treatment methods, informed consent was obtained. Each woman's basic information is gathered on a proforma with identification numbers. The diagnostic inquiries were conducted by a medical officer during the same visit as the screening tests by the ANMs. The ANM administers the VIA test by applying freshly produced 4% acetic acid to the cervix after inserting a sterile Cusco's self-retaining vaginal speculum. A halogen bulb is used to provide adequate lighting since the results are collected after one minute. When a well-defined, dense, act white patch with regular edges appears linked to the squamocolumnar junction, the test is considered successful. The test is classified as either positive or negative depending on whether an acetowhite area is seen in the transformation zone or whether there has been no change or only a change that is worrisome for invasive malignancy, such as a growth or ulcerative lesion. Also, pelvic organ prolapse (POP) was detected and a ring pessary was inserted after an examination of the cervix.

TREATMENT

After a cervical examination in five districts, women with VIA-positive lesions received "screen and treat" cryotherapy treatment from the medical staff. Only women (excluding some) with precancerous lesions were treated after the protocol was reviewed owing to logistical problems with the supply of cryo gas, assuring compliance with the treatment as a "screen, test, and treatment procedure." The ring pessary was inserted in women who had PoP. Few women with PoP were excluded due to time and resource limitations. Women with invasive cancer who needed treatment other than cryotherapy were referred to a higher center for proper care.

STATISTICAL ANALYSIS

The SPSS and MS Excel was used for the descriptive analysis of quantitative data in which frequencies and summaries were calculated. Similarly, the association between variables was found using regression analysis. The p-value of less than or equal to 0.05 was considered for indicating a significant association between variables.

QUALITY MAINTENANCE AND TRAINING

To manage this initiative, a few female health workers from five districts of Nepal were chosen and trained. The International Agency for Research on Cancer (IARC) manual was used to instruct the ANMs for 4 days on cervical screening procedures and cryotherapy, including didactic lectures, hands-on training sessions, and digital manuals. Following this, they were able to screen individuals in the community after two further weeks of practical training under supervision. Reorientation sessions were held periodically to enhance quality control.The study followed a standard ethical norm i.e., all the participants were informed about the study, and informed consent was taken from them. Voluntary participation was ensured along with participants' anonymity

FINDINGS

Age of the VIA-positive patients

The maximum number of patients who tested positive in visual inspection of the cervix (VIA) was from the age group 31-41 years i.e. 44.01% and the least of the VIA-positive patients from the age group 10-19 years i.e. 0.77%

Table 1: Age of the VIA-positive patients

Age group	Frequency	Percentage
10 to 19	2	0.77%
20 to 30	80	30.88%
31 to 41	114	44.01%
42 to 52	58	22.39%
53 to 63	5	1.93%
Total	259	100%

Descriptive findings of patients

The study was carried out in five districts of Nepal i.e. Sindhuli, Jhapa, Mahottari, Bara, and Dhanusa. The total numbers of patients seen were 8007. Among them, the maximum number of respondents were seen from Bara district i.e. 3702 and the least were from Dhanusa i.e. 282. The maximum number of patients from the Bara district reported pelvic organ prolapse (POP) i.e. 48.86%. Nearly one-third of patients i.e. 32.63% from Sindhuli reported POP. 10.6% of Jhapa reported POP. The least number of

patients were from Mahottari i.e. 4.4% followed by Dhanusa i.e. 3.40%.

A total of 579 ring pessary was inserted in the given five districts. More than half i.e. 55.95% of ring pessary was inserted in patients in Bara districts. Likewise, 28.69% of ring pessary was inserted in Sindhuli. 10.01% ring pessary was inserted in the Jhapa district. Similarly, 3.45% ring pessary was inserted in the Mahottari district followed by 2.07% in the Dhanusa district.

A total of 117 referrals was done in five districts. More than one-fourth of the patients i.e. 29.05% were made from the Mahottari district. Likewise, 11.96% of referrals were made from the Sindhuli district. 7.69% of referrals were made from the Jhapa district followed by 5.28% from the Bara district.

Altogether, 6994 visual inspections of the cervix with acetic acid (VIA) were done in five districts. Nearly half of the patients i.e. 47.26% VIA were done in the Bara district. Around one-fourth of the VIA i.e., 26.45% was done in the Sindhuli district. 11.60% VIA was done in the Mahottari district. In the Jhapa district, 10.64% VIA was done followed by 4.03% in Dhanusa.

Among the total VIA being done, the positive VIA was found in 259 patients. Nearly one-third i.e. 34.74% of the positive VIA was found in the Bara district. Around one-fourth i.e. 27.02% of Positive VIA was found in the Sindhuli district. 18.91% positive VIA was found in the Jhapa district. Likewise, 16.98% and 2.3% positive VIA were found in Mahottari and Dhanusa district respectively.

234 cryotherapy/Thermo coagulation was done in five districts. Among them, around one-third i.e. 38.46% cryotherapy was done in the Bara district. 29.48% of cryotherapy was done in Sindhu district. Likewise, 18.80%, 10.68%, and 2.56% of cryotherapy was done in Mahottari, Jhapa, and Dhanusa districts respectively.

The pelvic inflammatory disease was found among 3901 patients. Most of the reported PID i.e. 45.88% was found inthe Bara district. Nearly, one-third i.e. 32.27% PID was found in Sindhuli district. Likewise, 12.84%, 4.84% and 4.15% PID was found from Mahottari, Jhapa and Dhanusa district respectively.

Table 2: Descriptive findings of patients

Findings	Sindhuli	Jhapa	Mahottari	Bara	Dhanusa	Total

Number of POP	575 (32.63%)	187 (10.6%)	79 (4.4%)	861 (48.86%)	60 (3.40%)	1762 (100 %)
Ring pessary insertion	165 (28.49%)	58 (10.01%)	20 (3.45%)	324 (55.95%)	12 (2.07%)	579 (100 %)
Referrals for surgery	14 (11.96%)	9 (7.69%)	34 (29.05%)	60 (5.28%)	0	117 (100 %)
VIA done	1850 (26.45%)	744 (10.64%)	812 (11.60%)	3306 (47.26%)	282 (4.03%)	6994 (100 %)
VIA positive	70 (27.02%)	49 (18.91%)	44 (16.98%)	90 (34.74%)	6 (2.3%)	259 (100 %)
Cryotherapy	69 (29.48%)	25 (10.68%)	44 (18.80%)	90 (38.46%)	6 (2.56%)	234 (100 %)
PID	1259 (32.27%)	189 (4.84%)	501 (12.84%)	1790 (45.88%)	162 (4.15%)	3901 (100 %)
Number of patients seen	1930	981	1112	3702	282	8007

Association between variables

The association between VIA and other variables was found using regression analysis. The p-value of less than or equal to 0.05 was considered for indicating significant association between VIA and other variables. There is no association between visual inspection of the cervix with acetic acid (VIA) and Districts (p-value 0.904). (Table 3)

Table 3: between visual inspection of the cervix with acetic acid (VIA) and Districts

Districts	VIA done	P-value
Sindhuli	1850	
Jhapa	744	
Mahottari	812	
Bara	3306	
Dhanusa	282	0.904

There is a significant association between visual inspection of the cervix with acetic acid (VIA) and total number of pelvic organs prolapsed (p-value 0.004). There is a significant association between visual inspection of the cervix with acetic acid (VIA) and ring pessary insertion (p-value 0.0013).

DISCUSSION

In a remote, rural location with few medical services, this study details the implementation of a VIA-based cervical screening method. Despite never having been checked or being aware of cervical cancer, our experience has demonstrated that rural women accepted VIA tests administered by female health workers. Most of the women could walk to the screening clinics, which were located in the villages nearby, and the service was free.

The findings demonstrate that cervical screening, cryotherapy, and referrals for treatment may be successfully carried out even with limited resources by well-trained health professionals working under physician supervision. The capacity to diagnose (colposcopy/biopsy) and treat in the same visit as screening or therapy in

a single visit
is made possible by the instant availability of test findings, which is a huge logistical advantage. When women without clinical signs of big lesions or invasive cancer are treated with cryotherapy right away without choosing to undergo diagnostic tests or being referred for colposcopy or biopsy, the single-visit approach is associated with better outcomes. This study encompasses altogether 6994 visual inspections of the cervix with VIA in five districts. And among the total VIA being done, positive VIA was found in 259 (3.07%) patients. A total of 234 cryotherapy/Thermo coagulation was done in the women who required urgent treatment. This finding was somehow like the study done in rural Thailand which gave insights into the acceptability, practicality, and safety of a single approach after VIA screening. 798 of the 5999 women in this study (13.3%) tested positive for VIA, and 609 of the women who were eligible for urgent treatment sought the required treatment (13). The most cost-effective method for preventing cervical cancer in low-resource settings is VIA-based screening followed by immediate treatment, according to a model-based cost-effectiveness (CE) analysis comparing VIA, HPV, and cytology-based screening and treatment algorithms using data from South Africa (14).

In this study, a total of 117 referrals were done in five districts. In addition to this, PID was found among 3901 patients. A total of 579 ring pessary was inserted and a total of 1762 pelvic organ prolapsed (POP) was observed in the given five districts. Likewise, it was similar to a study that revealed that women were referred for colposcopy and histologic samples if they tested positive for any of the screening tests(15).In summary, our study's findings show that more research is needed to establish the long-term effectiveness of VIA-based screening in lowering the incidence of cervical cancer. The outcomes of ongoing studies will elucidate the function of VIA and associated tactics. The outcomes of completed and ongoing studies will probably offer useful information for creating public health regulations to reduce cervical cancer in high-risk nations around the world.

CONCLUSION

Despite its shortcomings, acetic acid visual inspection is a reliable screening method for premenopausal women in low-resource environments. It can be performed in all countries, and a provider who is motivated in doing so can even self-learn VIA by consulting manuals and atlases. Performance can be improved with constant practice and self-auditing. Even in rural areas that have limited

resources,
VIA administered by skilled female health professionals is a safe, reliable, and effective test that can save people from cervical cancer. These findings have significant implications for the effective provision of services in cervical screening programs in settings with limited resources.

CONSENT FOR PUBLICATION

All the authors agreed with this article's publication. The anonymity of all participants is guaranteed.

DISCLOSURE

The authors declare that they have no conflict of interest.

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