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Original Research Article

Study of feasibility and acceptability of screen and treat approach for cervical cancer prevention

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ABSTRACT

Background: Cervical cancer is the fourth most prevalent cancer among women globally, with approximately 604,000 new cases and 342,000 deaths reported Worldwide according to GLOBOCAN 2022. In India, cervical cancer ranks as the second most common cancer cervical cancer accounts for 6-29% of all malignancies in women in India. Most patients with cervical cancer in India are diagnosed at an advanced stage. Cervical cancer is both preventable and curable if detected early through proper screening.
Methods: The present study is a prospective study of 1 year which included 500 patients between age 30-50 years, selected after verifying inclusion and exclusion criteria. All the women were screened using VIA and underwent treatment with thermocoagulation. Immediate side effects and side effects at 3 and 6 monthly follow up visits were noted.
Results: In this study, a total of 500 women participated. The VIA positivity rate was 11.4%., 94.7% women underwent thermocoagulation. The mean VAS score for pain was 3.815±0.772. During 3 monthly followup visit, 25.92% females reported discharge per vaginum. No side effects were reported at 6 month follow up visit. The case detection rate was 6.4%. The positive predictive value (PPV) was 59.2%.
Conclusions: VIA is an excellent alternative to cytology and other expensive screening methods in resource-limited settings like ours. Similarly, thermocoagulation is a quick and straightforward procedure to perform. Utilizing VIA for screening and thermocoagulation as a treatment method has high acceptability among patients, with no significant side effects, making it a safe treatment option.

Keywords: VIA, Thermocoagulation, Cervical cancer

INTRODUCTION

Cervical cancer is the fourth most prevalent cancer among women globally, with approximately 604,000 new cases and 342,000 deaths reported worldwide according to GLOBOCAN 2022.[1,2] In India, cervical cancer ranks as the second most common cancer, with an incidence rate of 18.3% (123,907 cases) and a mortality rate of 9% (77,348 deaths) as per GLOBOCAN 2020 data.[3] Cervical cancer accounts for 6-29% of all malignancies in women in India.[4] Most patients with cervical cancer in India are diagnosed at an advanced stage. Cervical cancer is both preventable and curable if detected early through proper screening.

The increasing accessibility of point-of-care technologies and visual inspection screening tests is enhancing our understanding of cervical cancer screening and enabling the possibility of same-day screen-and-treat sessions.[5,6] The conventional pap smear test, along with timely treatment, has successfully reduced cervical cancer rates in countries with adequate resources. However, in developing nations like India, the scarcity of resources, lack of infrastructure, and shortage of skilled professionals

make pap test-based cervical cancer screening programs challenging to implement. As a result, there has been a significant shift towards non-cytological tests, such as visual inspection with acetic acid (VIA) and human papillomavirus (HPV) DNA testing. VIA is a simple, cost-effective test with moderate sensitivity and specificity for detecting pre-malignant lesions and can be combined with immediate, simple treatment options.[7] This approach saves time and provides immediate treatment, reducing anxiety about future test results and eliminating the need for further testing.[8]

In countries with limited resources, procedures like the loop electrosurgical excision procedure (LEEP) are seldom performed due to a shortage of skilled professionals and the high costs of the necessary equipment and infrastructure. However, alternative methods like cryotherapy and thermocoagulation are simpler and more cost-effective. Although cryotherapy is highly effective, its use can be challenging due to the scarcity of refrigerant gas. Both thermocoagulation and cryotherapy have similar success rates, but thermocoagulation offers distinct advantages.[9] It uses compact, portable, and durable equipment that can destroy abnormal cells at temperatures of 100-120 degrees celsius in a short amount of time, requiring very little electricity. This study sought to explore the feasibility and acceptance of a screen-and-treat strategy, utilizing VIA for detecting pre-malignant cervical lesions and applying thermocoagulation for treatment in women between the ages of 30 and 50.

METHODS

This prospective study was conducted at Bebe Nanki mother and childcare centre, part of the department of obstetrics and gynaecology at government medical college, Amritsar, from September 2022 to August 2023. A total of 500 women participated in the study. The research was initiated following approval from the institutional ethical committee at government medical college, Amritsar.

Inclusion criteria

Sexually active women aged 30-50 years who had not been previously screened for cervical cancer, had no history of invasive cervical treatment, and were free of any active cervical disease, such as acute cervicitis were included.

Exclusion criteria

Presence of glandular neoplasia or cervical cancer, pregnancy, age outside the 30-50 range, ulcerative or proliferative cervical growth, and lack of consent or willingness for follow-up were excluded.

The study enrolled 500 women between the ages of 30 and 50 at Bebe Nanki mother and childcare centre in Amritsar. After obtaining informed consent, participants provided detailed medical histories and underwent screening using VIA. During the procedure, the external genitalia were examined, and 5% acetic acid was applied to the cervix to detect any acetowhite changes, especially in the transformation zone (TZ). Women who had positive VIA results underwent a cervical punch biopsy, which was preserved in 10% formalin and sent for routine histopathological examination (HPE). The collected data was then statistically analyzed to evaluate the feasibility and acceptability of a screen-and-treat approach for preventing cervical cancer.

RESULTS

Majority of the women (89.4%) were from age group 30-40 years with mean age of 35.42±5.06 years. Maximum number of the women were from urban areas (67.4%) and 32.6% were from rural areas. The majority of the women were of parity between 1 and 2 (65.4%). The VIA positivity rate (primary outcome) was 11.4%. Majority of the women who were VIA positive were from urban background (68.4%). Maximum number of VIA positive were of parity between 1 and 2 (59.7%). All the women who were screen positive were eligible for thermocoagulation (100%). Maximum number of the women were in the type 1 TZ (96.49%) and rest were in type 2 TZ (3.5%). The 94.7% of the women accepted thermocoagulation as treatment in the same sitting. 5.3% of VIA positive women did not accept the treatment and opted out. The only side effect reported after thermocoagulation (secondary outcome) was pain and was in all the women (100%). Mild and moderate intensity of pain was reported as per VAS score in 35.19% and 64.81% of women respectively. The mean VAS score was 3.815±0.772. Only one quarter of the women reported discharge per vaginum at their 3rd month follow up visit (25.92%). On P/S examination at 3 month follow up, vagina and cervix were healthy. In 94.4% cicatrisation was present. The dropout rate at 6 monthly follow up visit was 7.4%. None of the females reported any side effects during their 6th month follow up visit and P/S findings were normal in all the women who came for follow up. Cervical punch biopsies were sent of all the screen positive women and sent for HPE. CIN 1, CIN 2 and CIN 3 were detected in 51.9%, 1.8% and 3.7% respectively on HPE. SCC was detected in 1.9% on HPE.

On HPE, Chronic cervicitis and normal histology/endocervical polyp was found in 18.5% and 22.2% respectively. The PPV for VIA was 59.2%. The total detection rate of CIN 1, CIN 2, CIN 3 and cervical cancer was 6.4%. The detection rate for CIN 1, CIN 2, CIN 3 and cervical cancer was 5.6%, 0.2%, 0.4% and 0.2% respectively.

In Table 1, The VIA positivity rate was 11.4%.

In Table 2, of the 57 VIA-positive women eligible for thermoablation, 54 (94.7%) underwent thermoablation in the same session, while 3 (5.3%) declined treatment.

Table 1: Distribution according to VIA results.

VIA result	N	Percentage (%)
Acetowhite area		
Positive	57	11.4
Negative	443	88.6
Total	500	100

Table 2: Distribution of VIA positive women who opted for thermoablation.

Women who opted treatment in same sitting	N	Percentage (%)
Yes	54	94.7
No	3	5.3
Total	57	100

In Table 3, pain severity was assessed using the VAS, where scores were classified as follows: 0-4 mm for no pain, 5-44 mm for mild pain, 45-74 mm for moderate pain, and 75-100 mm for severe pain. Among the 54 women who reported pain after thermocoagulation, 19 (35.19%) experienced mild pain (VAS score 1), 35 (64.81%) had moderate pain (VAS score 2), and none had severe pain (VAS score 3). The mean VAS score was 3.815±0.772.

Table 3: Distribution according to pain intensity as per VAS scale.

VAS score category	N	Percentage (%)
No pain (0-4 mm), score 0	0	0
Mild (5-44 mm), score 1	19	35.19
Moderate (45-74 mm), score 2	35	64.81
Severe (75-100 mm), score 3	0	0
Total	54	100
Mean VAS score	3.815±0.772	

In Table 4, at the 3-month, among the 54 patients, 25.92% experienced discharge per vaginum, while no cases of bleeding, pain, or fever were reported. By the 6-month follow-up, no patients reported any of these side effects.

In Table 5, among the 54 biopsies conducted on VIA-positive cases who underwent thermocoagulation, HPE revealed that 28 biopsies (51.9%) were classified as CIN 1. One biopsy (1.8%) was classified as CIN 2, and two biopsies (3.7%) were identified as CIN 3. Additionally, one biopsy (1.9%) was diagnosed as squamous cell carcinoma. Chronic cervicitis was found in 10 biopsies (18.5%), while 12 biopsies (22.2%) were reported as normal or endocervical polyp.

Table 4: Distribution according to side effects at 3 months and 6 months follow visit.

Side effects	At 3 months, (n=54)	At 6 months, (n=54)
Discharge per vaginum	14 (25.92%)	0
Bleeding per vaginum	0	0
Pain	0	0
Fever	0	0

Table 5: Distribution according to biopsy result of HPE.

Biopsy result	N	Percentage (%)
Normal/endocervical polyp	12	22.2
Chronic cervicitis	10	18.5
CIN1	28	51.9
CIN2	1	1.8
CIN3	2	3.7
Cervical cancer (Squamous cell carcinoma)	1	1.8
Total	54	100

We found that PPV of VIA test in our study came out to be 59.2%.

Table 6: Detection rate of CIN 1, CIN 2, CIN 3 and cervical cancer.

Type of lesion	Histologically proven cases	Detection rate (%)
CIN1	28	56
CIN2	1	5.6
CIN3	2	0.2
SCC	1	0.4
Total	32	62.2

The detection rates for various cervical lesions among the biopsies taken from VIA-positive cases who received thermocoagulation are as follows: CIN 1 was detected at a rate of 5.6%, CIN 2 at 0.2%, CIN 3 at 0.4%, and cervical cancer (squamous cell carcinoma) at 0.2%. The overall detection rate for CIN 1, CIN 2, CIN 3, and cervical cancer combined is 6.4%.

From Table 7, the PPV of VIA test in our study came out to be 59.2%.

Table 7: PPV of VIA.

VIA +ive cases	CIN1	CIN 2	CIN 3	SCC	Total	PPV
54	28	1	2	1	32	59.20%

DISCUSSION

Cervical cancer is a leading cause of cancer-related deaths in India, accounting for one-fourth of the global burden of this disease.[10,11] It remains a significant public health challenge in low-and middle-income countries, necessitating screening strategies such as VIA.

In our study, the mean age of participants was 35.42±5.06 years. A study by Rijal et al found that most women screened were in the 31-40 age group, with a mean age of 41.48±9.72 years.[12] In our research, 500 women were screened using VIA, and 57 (11.4%) tested positive. Comparatively, in a study by Viviano the VIA positivity rate was 11.9%.[13] Other studies, such as those by Campbell et al and Lee et al reported VIA positivity rates of 6.1% and 7.35%, respectively.[14,15]

At the three-month follow-up in our study, of the 54 patients monitored, 25.92% reported vaginal discharge, with no instances of bleeding, pain, or fever. By the six-month follow-up, none of these side effects were reported.

In a study by Viviano the primary side effect was pain, with an average visual analogue scale (VAS) score of 3.0±1.6, and 99.9% of participants returned for follow-up, with 99.1% reporting discharge during their visit.[13]

In our study, out of the 500 women screened, 57 (11.4%) were VIA positive, and all these women were eligible for thermoablation treatment. Of these women, 55 (96.49%) had a type 1 TZ, and 2 (3.5%) had a type 2 TZ, where the probe was accessible. In contrast, Lee et al reported a VIA positivity rate of 7.35% in the women who underwent thermoablation treatment.[15]

The PPV in our study was 59.2% for detecting CIN 1 and greater lesions. In a similar study by Kooijman et al the PPV was 58.7% for CIN 1 and greater lesions.[16]

The advantage of VIA is the immediate availability of results and the capability to provide treatment during the same visit, which helps reduce dropout rates, as observed in our study.

CONCLUSION

VIA is an excellent alternative to cytology and other expensive screening methods in resource-limited settings like ours. Similarly, thermocoagulation is a quick and straightforward procedure to perform. Utilizing VIA for screening and thermocoagulation as a treatment method has high acceptability among patients, with no significant side effects, making it a safe treatment option.

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