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## Cryotherapy: A Method for Relieving Symptoms of Cervical Ectopy

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### Abstract

**Objectives:** Benign cervical ectopy (CE) may cause chronic or recurrent symptoms leading to women repeatedly being referred to gynecology clinics. The study is aimed to present a safe and effective method for relieving symptoms of CE.

**Methods:** This double-blind clinical trial was conducted in the Department of Obstetrics & Gynecology, among 174 women with CE who complained of persistent or recurrent symptoms of cervicitis in the last six months. Patient's demographic data, medical history, symptoms, and vaginal examination results were recorded. Normal co-test or Pap smear was required to enter the study. Participants were divided into two groups; the intervention group received cryotherapy and the control group underwent cryo-placebo (inserted the probe without true cryotherapy). The outcomes including improvement of symptoms and CE were monitored one, three, and six months later.

**Results:** The prevalence of symptoms in the two groups were not significantly different ( $p > 0.050$ ). Symptom improvement was significantly higher with cryotherapy: vaginal discharge ( $p = 0.006$ ), itching ( $p < 0.001$ ), dyspareunia ( $p = 0.005$ ), post-coital bleeding ( $p = 0.023$ ), and pelvic pain ( $p = 0.009$ ). If the symptoms did not disappear, their severity was lower after cryotherapy, comparatively ( $p < 0.050$ ). Examination showed more improvement of CE following cryotherapy ( $p < 0.001$ ). Cryotherapy showed no remarkable side effects and was associated with more satisfaction ( $p < 0.001$ ).

**Conclusions:** Cryotherapy is a safe, effective, fast-acting, and cost-benefit therapy that can be considered for the treatment of symptomatic CE. This treatment is considered to be appropriate in genitourinary clinics as these have routine screening procedures for various genital infections.

**Keywords:** Cervical ectopy, Cryotherapy, Gynecology

### Introduction

Cervical ectopy (CE) can be associated with chronic or recurrent symptoms of cervicitis like leucorrhoea, vaginal itching or pruritus, dyspareunia, pelvic pain, and post-coital bleeding, which cause patients to visit a doctor repeatedly [1, 2]. CE is distinguished by an erythematous and inflamed-like region at the external ostium, which forms due to the eversion of the endocervical columnar mucosal layer towards the outside. CE may be silent and asymptomatic. If symptomatic, it can cause prolonged physical and psychological distress for women due to chronic or recurrent vaginal discharge and discomfort.

Some authors believe that CE may predispose women to contamination of human papillomavirus (HPV). Long-term exposure of everted columnar epithelium to the vaginal environment leads to squamous metaplasia, this rapid cellular generation can be a suitable site for inoculation of HPV during intercourse [1, 3, 4].

Between the 1920s and 1970s, gynecologists widely performed ablation of ectopic epithelium in an attempt to diminish the symptoms of chronic cervicitis and/or reduce susceptibility to lower tract infection or dysplasia. They believed that the elimination of the squamocolumnar junction accelerates the duration of cellular transformation, shortens the time qualified for incorporation and propagation of HPV particles and, subsequently, declines the incidence of cervical intraepithelial neoplasia (CIN) [4]. However, this disputable topic concerning ablation of benign CE remained quiet for some decades. Many of such patients have associated cervical ectropion—that is, extension of endocervical columnar epithelium onto the ectocervix.

In recent years, the importance of ablation of the ectopic zone has been stated to achieve several expectations including relieving symptoms of chronic cervicitis and prevention or treatment of

CIN particularly in low-income countries, as they lack the requisite infrastructures for triage, diagnosis, and management [2, 5]. Various methods have been proposed for damaging the transformation zone [6, 9].

Cryosurgery is considered to be the most useful treatment of this condition [5]. Cryotherapy is an old and common procedure first introduced in 1960. It consists of a handle device with a metal probe on its tip and a flexible connector that transmits carbon dioxide or nitrous oxide to the probe to freeze and ruin the transformation zone. There are few randomized trials in the literature, hence to determine if cryotherapy can be used as a safe and effective method for relieving symptoms of CE.

## Methods

This randomized clinical trial was conducted in the Department of Obstetrics & Gynecology. After obtaining the approval of the ethics committee, and taking consent forms, 174 women with chronic or recurrent symptoms of cervicitis whose vaginal examination showed CE were enrolled in the study. The demographic data, medical history, and also frequency, duration, and specifications of symptoms were collected in a checklist.

Inclusion criteria included CE in the visual vaginal examination, complaints of suprapubic pain, increased vaginal discharge (leucorrhea), vaginal itching or pruritus, dyspareunia and postcoital bleeding, normal co-test or Pap smear, lack of sexually transmitted disease, and reproductive age > 21 years. The criterion for chronicity was the persistence of at least one symptom for at least six months or recurrence of symptoms at least three times in the previous six months despite obtaining treatment. Exclusion criteria were virginity, age < 21 years, past history of CIN, previous cervical ablation procedures and loop electrosurgical excision procedure (LEEP), background diseases associated with immunocompromised conditions (i.e., diabetes mellitus, immunodeficiency syndromes) and use of corticosteroid or immunosuppressive drugs, mental disorders, epilepsy, pregnancy, lactation, menopause, acute vaginal candidiasis, any abnormality in cytology, and positivity of HPV or other sexually transmitted diseases.

The 174 eligible women were equally divided into two groups by block randomization; the intervention group and control group. Cryotherapy involves freezing temperatures of -22 to -30 o C, which results in crystallization and evaporation of intracellular fluid and ultimately, demolition of cells at -85 o C. The procedure is performed until the formation of an ice ball, which takes up to five minutes, most often with freeze-thaw cycle [5]. In the control group (who underwent demonstrative placebo-cryotherapy), the assistant researcher put the probe near cervical ostium and pressed the trigger without manipulation and destruction of cervical tissue. Patients in both groups received a similar vaginal pharmacologic cream, which started five days after cryotherapy and an appropriate systemic drug. All participants were asked about the severity of symptoms

(leucorrhea, vaginal itching, pruritus, pelvic pain, dyspareunia, and post-coital bleeding) using a visual analog scale (VAS) before the procedure. The primary examination was done by a gynecologist, while interventions concerning cryotherapy or placebo took place by a trained midwife.

The women attended follow-up visits one, three, and six months post-treatment and their symptoms were reassessed using the VAS and improvement of the CE region inspected speculum. A self-reported questionnaire was used to assess a patient's satisfaction with treatment. Finally, the collected data was entered into SPSS Statistics (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) and analyzed using the chi-squared test, Fisher's exact test, Mann-Whitney U test, t-test, and the level of decreasing symptoms were compared in the two groups. A p-value < 0.050 was considered significant.

## Results

Of the 174 women enrolled in the study, 156 were aged between 21–54 years old and eligible for evaluation. There demographic details are given in Table 1.

The complaints of the women suffering from symptoms of CE were evaluated before and after the intervention and compared using Fisher's exact test. The prevalence of symptoms was not significantly different between the two groups before any intervention ( $p > 0.050$ ). Following the intervention, the incidence of symptoms in the cryotherapy group decreased significantly compared to the control group ( $p < 0.001$ ) [Table 2].

Following intervention, the severity of symptoms declined significantly in cryotherapy group compared to the cryo-placebo group ( $p < 0.050$ ). Visual inspection of the CE area showed significant healing following cryotherapy one month after treatment ( $p < 0.001$ ).

The transient side effects of suprapubic crampy pain and hot flush, which were seen following the procedure, showed no significant difference between the two groups ( $p = 0.600$  and  $p = 0.640$ , respectively). Vaginal discharge in the intervention group was higher than the control group, which took as long as a few days ( $p < 0.001$ ). Spotting in the control group was greater than the intervention group ( $p = 0.007$ ). The participants who received cryotherapy were more satisfied with their treatment than the cryo-placebo group (88.2% vs. 22.7%) ( $p < 0.001$ ).

**Table 1:** Patients demographic data

Variables	Cryoplacebo	Cryotherapy	p-value
Age, years	31.2 ± 7.6	29.0 ± 6.5	0.390
Marital age, years	19.9 ± 4.1	19.7 ± 4.0	0.850
Marriage length, years	10.8 ± 8.2	10.0 ± 6.9	0.490
Parity	1.9 ± 1.5	1.5 ± 0.9	0.660
Abortion	0.3 ± 0.5	0.3 ± 0.6	0.060**
Number of children	1.8 ± 1.5	1.6 ± 1.1	0.120

**Table 2:** Prevalence of symptoms experienced by patients before and after treatment in the intervention and control groups.

Symptoms	Pre-intervention, n (%)		p-value	Post-intervention, n (%)		p-value
	Cryoplacebo	Cryotherapy		Cryoplacebo	Cryotherapy	
Leucorrhea	66 (88.0)	61 (80.3)	0.141	57 (76.0)	42 (55.3)	0.006
Vaginal itching and pruritus	56 (74.7)	49 (64.5)	0.118	38 (50.7)	15 (19.7)	<0.001
Pelvic pain	51 (68.0)	52 (68.4)	0.547	40 (53.3)	25 (32.9)	0.009
Dyspareunia	45 (60.0)	47 (61.8)	0.474	37 (49.3)	21 (27.6)	0.005
Post-coital bleeding	33 (44.0)	37 (48.7)	0.340	18 (24.0)	8 (10.5)	0.023

## Discussion

Many women suffer from repeated or sustained symptoms of cervicitis worldwide. These symptoms can affect the quality of life and marital relationships and, consequently, affect the health of the family atmosphere. Although some physicians contradict any surgical treatment for benign CE, we advocate its cases where the symptoms are resistant to pharmacological intervention<sup>[1, 10]</sup>. We believe that the destruction of the everted glandular layer not only relieves symptoms, but also prevents sexually transmitted infections such as chlamydia, gonorrhoea, and HPV. Infection with HPV18 was shown to be more prevalent in women with CE<sup>[11]</sup>.

Our study showed that ablation with cryotherapy has an acceptable long-term effect on the treatment of these patients while lacking remarkable side effects. All our participants had already received systemic and topical drugs at least three times without a good response in the six months before the study. Our study supports the results of other researchers who introduced cryotherapy as an acceptable modality for managing symptomatic CE<sup>[1, 2, 12, 13]</sup>. They reported that cryotherapy had the highest efficacy for reducing abundant leucorrhoea, but the lowest success rate for patients with abundant leucorrhoea and recurrent cervicitis, which was similar to our findings. They declared that delay in treatment declined the success rate<sup>[1, 2, 12, 13]</sup>.

Notably, few harmless side effects including temporary hot flush, abdominal cramps, and leucorrhoea were observed in our findings, which were in agreement with previous reports,<sup>[1, 3, 5]</sup> but they did not have any significant impact on the satisfaction rate of our participants.

Recently, cryotherapy has been more beckoned in new recommended guidelines for cervical cancer screening. Accordingly, in areas with limited resources, which lack required experts and infrastructures for triage and management of CIN like colposcopy or LEEP, cryotherapy has been recommended as a simple and safe method. In these situations, after application of acetic acid on the cervix, acetowhite spots are distinguished by visual inspection and destroyed with cryotherapy simultaneously<sup>[14]</sup>.

Benign CE is a relatively common finding among fertile women. It is typically asymptomatic and may be found incidentally during examination. If it becomes symptomatic, it might be better to apply an ablative approach. Providing a good quality of life for women is essential to have a healthy population. Paying special attention to women with CE who complain of recurrent or chronic distressing symptoms of cervicitis is mandatory. Pharmacotherapy alone is sometimes ineffective and ablation of the ectopic region of cervix remains the final option for management. Cryotherapy is a simple, cost-effective, and safe outpatient treatment for ablative goals. Besides elimination of the symptoms, it can have considerable benefits for the prevention and treatment of CIN, particularly in low resource countries. Further investigations need to warrant the obtained results.

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