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Comparative analysis of cryotherapy & silver nitrate for benign cervical erosions

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Abstract
Background: Cervical erosion is one of the most common gynaecological problems found in approximately 15% of women attending outpatient department. Cervical erosion is the replacement of nonkeratinized stratified squamous epithelium of porto vaginalis by columnar epithelium of endocervix. Though it is not fatal, yet the long-term association with the disease and the number of symptoms both related to genitourinary symptoms as well psychological imbalance in the patient needs attention.
Aims and objectives: To study and compare the efficacy & safety of Cryotherapy versus Silver Nitrate therapy for management of cervical erosion. To study if any side effects or complications arise while on treatment
Material and methods: Prospective observational study conducted at a tertiary care institute.68 women with benign cervical erosion were considered for enrolment and were randomly assigned for silver nitrate cauterization and cryotherapy. 33 patients were recruited in silver nitrate cauterization group and 35 patients in cryotherapy group in study from January 2019 to September 2020. Their findings and investigations (CBC, VDRL and HIV) were noted. After they underwent cauterization, they were followed up after 1st week, 2nd week, 1 month and then after 2 months and maximum 4 sittings in each group if required. Findings, complications, and level of satisfaction were noted down
Conclusion: Cryotherapy and silver nitrate cauterization is equally effective in treating cervical erosion

Keywords: cervical erosions, cryotherapy, silver nitrate cauterization

Introduction
Cervical erosion (CE) is found in approximately 15% of women attending outpatient department.

CE are erythematous and inflamed-like region at the external ostium, which forms due to the eversion of the endocervical columnar mucosal layer towards the outside [1].

The symptoms can be profuse vaginal discharge, vaginal itching or pruritus, dyspareunia, pelvic pain, and post-coital bleeding, intermenstrual bleeding, infertility, irritability, infertility discomforting the women [2, 3, 4].

Many women are born with cervical erosion, it can be caused by several reasons, such as: hormonal changes, using oral contraceptives, pregnancy, cervicovaginal infection [5].

With lower cell mediated immunity, glandular epithelium creates facilitatory environment for infections with fertility implications as well as carcinogenic implications [6, 7, 8].

Erosions have been classified into three verities: congenital, erosions associated with chronic cervicits and papillary or hormonal erosion [9].

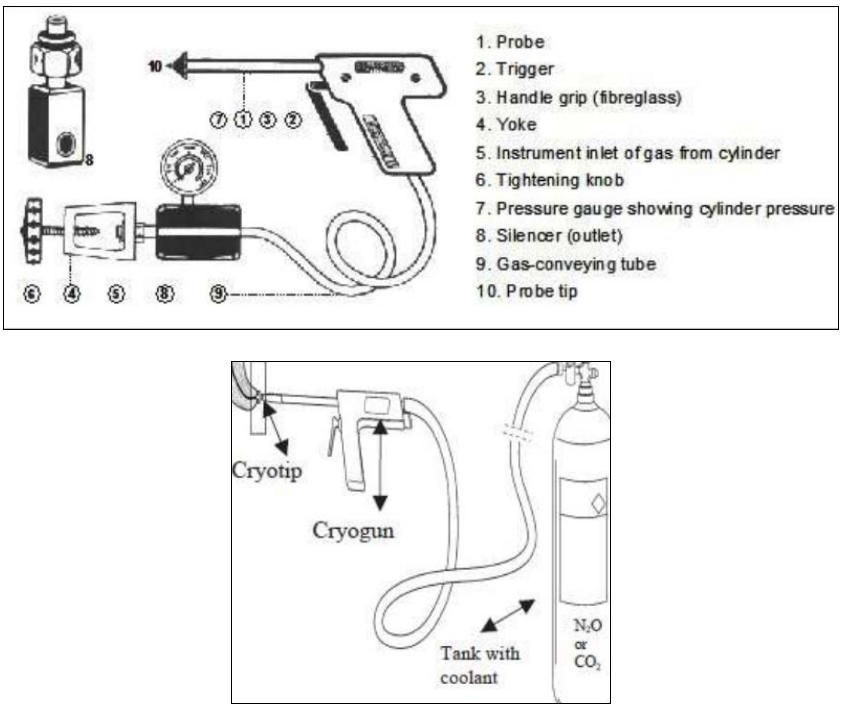
Treatment of chronic cervicitis and erosions are cryotherapy, silver nitrate cauterization, diathermy cauterization, laser therapy, conization operation, policresulen.

Cryotherapy
Cervical lesions have been cauterized chemically with silver nitrate and thermally by electrocautery and cold cautery [6]. Cryotherapy is the use of low temperatures locally or generally in medical therapy. Its goal when using extreme temperatures is to destroy cells by crystallizing the cytosol [6].

Mechanism of action of cryotherapy
He cryotherapy technique uses a cryoprobe with a tip made of highly conductive metal (usually silver and copper), that makes direct surface contact with the ectocervical lesion.

A substantial drop in temperature is achieved when a compressed refrigerant gas is allowed to expand through a small aperture in the cryoprobe.[10]Nitrous oxide (N2O) or carbon dioxide (CO2) is the refrigerants of choice. The physical effect of cryotherapy is known as "direct cell injury". At freezing temperature, water crystallizes in the extracellular spaces and in turn leads to cellular dehydration called as "solution-effect injury". Cells shrink and membranes and cellular components are damaged. During thawing, ice melts, the extracellular environment rapidly becomes hypotonic allowing water to enter within the damaged cells, causing cell membrane disruption.

Cryotherapy equipment figure 1 [6]



The cryotherapy unit consists of a compressed gas cylinder (tank) a yoke with a tightening knob and an inlet of gas to connect the gas cylinder to the cryotherapy gun, a pressure gauge showing the cylinder gas pressure, an outlet silencer, a cryotherapy gun with handle grip, a gas trigger to allow the gas to be released to the cryotherapy probe at high pressure and the cryotherapy probe [10].

Advantages

It is quick and easy, short time, no hospitalization needed, no anaesthesia is required, simple and inexpensive equipment, there is minimal blood loss due to a sealing off effect on the frozen tissue, it is the less expensive than Laser, there is no need of electricity, cervical stenosis or rate of pregnancy is not altered, it can be used in cases of blood dyscrasias [9].

Disadvantages

Discharge which is usually profuse, watery and may last for 2-3 weeks, Uterine cramping may last for 36 hours, vaginal pain if probe touches the vaginal wall, Vasomotor reaction in form of flushing, dizziness, headache, can occur during procedure. Due to friability of treated area, contact bleeding may occur so intercourse should be avoided for 3-4weeks [10].

Some women may feel light-headed if they get up from the table immediately after the procedure. Cervical stenosis occurs in less than 1% of women; reduced mucus production occurs in 5-10% of women [10].

Szemesi I, MatányiS, Scömör S Jr found 95% healing in 8 weeks by cryocoagulation in cervicitis resistant to conservative therapy [11]. Hurt WG successfully used cryotherapy in treatment of mild and moderate dysplasia of the ectocervix and chronic cervicitis [12].

Konnegen and colleagues found cure rate was 92% that after a single cryosurgery, and 98% after a second application [13]. Baram *et al.* recommended that infertile patients with hostile cervical mucus and ectropion could be treated by cryosurgery [14]. Wojtys A, Zdebski Z reported complete recovery in the form of typical stratified squamous epithelium in 95.3% of cases [15]. Matanyi S observed in 1248 cervical cryosurgeries that side effects (hypogastric discomfort, vascular reactions) were negligible; profuse vaginal discharge was present following the treatment [16].

Management of women for whom cryotherapy fails

Treatment failure is 5-10% in the first year. It is advisable to biopsy all persistent lesions and then re-treat with cryotherapy, LEEP, or cold- knife conization, as appropriate [10].

(Chemical cauterization) Silver nitrate cauterization for cervical erosion

Silver nitrate is used as a cauterizing agent and is available as a solution or an applicator stick. The applicator sticks, known as silver nitrate sticks or caustic pencils, contain silver nitrate and potassium nitrate. When applied to wounds, silver nitrate sticks deliver free silver ions to the tissue that form an Escher as they bind to tissue and obstruct vessels [17]. In presence of moisture it disintegrates into Ag+ ions which are responsible for its chemical cauterization and coagulative necrosis of the erosion [18, 19, 20]. The entire lesion should be located in the ectocervix without extension to the vagina and /or endocervix and is visible in its entire extent and doesn't extend more than 2 to 3 mm into the canal

Prerequisites: There should be no evidence of invasive cancer. The endocervical canal should be normal and there is no

suggestion of glandular dysplasia. The woman is not pregnant. If the woman has recently delivered, she is at least three months post-partum There is no evidence of pelvic inflammatory disease. The woman has given informed written consent to have the treatment

Side effects of silver nitrate include
Burning and skin irritation, staining of the skin.

Aims and objectives
1. To study and compare the efficacy & safety of Cryotherapy & Silver Nitrate therapy for management of cervical erosion.
2. To study if any side effects or complications arise while on treatment

Material and Methods
68 women with benign cervical erosion were considered for enrolment and were randomly assigned for silver nitrate cauterization and cryotherapy. 33 patients were recruited in each silver nitrate cauterization group and 35 patients in cryotherapy group in study from January 2019 to September 2020.Their findings and investigations (CBC, VDRL and HIV) were noted. After they underwent cauterization, they were followed up after 1st week, 2nd week, 1 month and then after 2 months and maximum 4 sittings in each group if required.
1. **Study design:** Prospective observational study
2. **Place of study:** Tertiary Hospital
3. **Proposed duration of study:** 18 months
4. Analysis Test applied are Chi square test and test for appropriate co-relation

The inclusion criteria
Patient in age group of 18-40- year-old with benign cervical erosion after pap smear report willing to enrol in the study willing to follow-up for 2 months Written informed valid consent taken.

The exclusion criteria
Patient not willing to give consent, active genital tract infection, adenocarcinoma, CINI, CINII, CINIII, Exophytic lesions, Patient with DM (recurrent infection),immunocompromised patients, patients taking oral contraceptive pills History, physical examination, general examination and gynaecological examination was done & laboraty parameters were noted

For cryotherapy
Nitrous Oxide gas was used in this study.
Procedure
The procedure was performed during post menstrual period. A cryoprobe was placed in contact with the cervix and the system was activated. An ice ball was allowed to develop up to a 5mm lateral spread beyond the lesion. The Freeze time of the cryocauterization is 3 minutes and the thaw time was 5 minutes. If the lesion was too large, multiple applications were made, maximum 3. The system was deactivated and the probe was allowed to separate from the frozen cervical tissue. The patients were explained that they may experience a heavy watery discharge for the first month after cryotherapy resulting from the sloughing of dead tissue and exudates from the treatment site.

For silver nitrate cauterization
Procedure
The procedure was performed during post menstrual period. About 4 gm of 50% silver nitrate was taken in 8 ml of distilled water and applied on the cervical erosion with swab stick using aseptic precaution**.** The patients were explained that they may experience a mild discomfort or pain in the lower abdomen due to sloughing of dead tissue.
In both the groups patients were explained about possibility of mild cramp like pain and were told to report if fever, heavy bleeding or severe pain occurred. They were asked to refrain from sexual intercourse & antibiotics were given for 5 days to all women.

Limitation of study
The limitation of the study is that the sample collection has a selection bias in order to have patients with similar demographics and pre-operative co morbid conditions in both the groups so as to limit the confounding factors to get proper comparison.

Results
A total of 68 patients were included in the study initially, they were divided into two groups. There were 33 patients undergoing silver nitrate cauterization and 35 patients undergoing cryotherapy. Three patients who were undergoing silver nitrate cauterization didn't follow-up and 5 patients undergoing cryotherapy didn't follow-up have been excluded from the study for proper comparison.
It was observed that cervical erosion was more commonly seen in age group from 26 to 35 years of age
It was observed that more multigravida came to outpatient department with symptoms of cervical erosion than nulligravida

Table 1: Parity wise distribution of cervical erosion

Parity	Percentage
Nulliparous	3.33
Primiparous	35
Para2	36.66
Para3	18.3
Para4	6.66

All patients who came to outpatient department had complaints of white vaginal discharge, 28% also had lower abdominal pain, 10% had back pain and only 1.6% had intermenstrual bleeding

Table 2: Chief complaints of the patients with cervical erosion

Chief complaint	Percentage
White vaginal discharge	100
Lower abdominal pain	28.3
Back pain	10
Inter menstrual bleeding	1.6

It was observed that all 3 types of cervical erosion –anterior, posterior and circumoral were almost in equal number in the above sample population

Table 3: Distribution according to the type of cervical erosion

Type of erosion	Percentage
Anterior	31.6
Posterior	23.33
Circumoral	27

This table shows the distribution of patients as per the age group, parity, type of lesion, size of lesion and complaints in patients who underwent cryotherapy and silver nitrate cauterization for cervical erosion

Table 4: Distribution as per the age group, parity, type of lesion, size of lesion and Complaints

		Procedure Type			
		Silver Nitrate		Cryotherapy	
		Count	Percentage	Count	Percentage
Age groups	20 to 30 years	17	53.10%	15	46.90%
	30 to 40 years	12	44.40%	15	55.60%
	Above 40 years	1	100.00%	0	0.00%
Parity	Nullipara	2	100.00%	0	0.00%
	Primipara	11	52.40%	10	47.60%
	Multipara	17	45.90%	20	54.10%
Erosion size	Less than 2cm	19	54.30%	16	45.70%
	Greater than 2cm	11	44.00%	14	56.00%
Type of Erosion	Anterior	9	47.40%	10	52.60%
	Circumoral	14	51.90%	13	48.10%
	Posterior	7	50.00%	7	50.00%
Complaints	Only Vaginal Discharge	21	51.20%	20	48.80%
	Vaginal Discharge and lower abdominal pain	8	66.70%	4	33.30%
	Vaginal discharge, lower abdominal pain, back pain	1	16.70%	5	83.30%
	Intermenstrual bleeding	0	0.00%	1	100.00%

Majority of patients in both the groups had erosion of less than 2 cm and two groups (patients undergoing cryotherapy and silver nitrate cauterization) were comparable with respect to size of cervical erosion (p value being 0.4)

Table 5: Comparison of cervical erosion size in silver nitrate and cryotherapy Group chi-square 0.617 df1, P value .432

Size	Silver nitrate%	Cervical erosion%
Less than 2 cm	63.3	53.3
More than 2 cm	36.7	46.7

Majority of patients in both the groups had erosion of circumoral type and two groups (patients undergoing cryotherapy and silver nitrate cauterization) were comparable with respect to type of cervical erosion (p value being 0.956)

Table 6: Comparison of cervical erosion type in silver nitrate and cryotherapy chi-square 0.09, df 2, p value .956

Type	Silver nitrate%	Cryotherapy%
Anterior	30	33.3
Posterior	46.7	43.3
Circumoral	23.3	23.3

It was observed that, there was a significant difference in first- and second-week follow-up of patients treated with silver nitrate and cryotherapy, in the first week the patients treated with silver nitrate responded better (only 3 were symptomatic of 30). While patients who were treated with cryotherapy 100% were symptomatic, similar trend was seen in 2ndweek as well. After 1 month the patients who had undergone cryotherapy were comfortable It also signifies that after a period of 1 month there was no difference in patient treated with cryotherapy and silver nitrate and both were equally effective for cervical erosion management.

Table 7a: Comparison of symptomatic improvement with each visit in patients of cervical erosion after being treated with silver nitrate and cryotherapy.

		Procedure Type			
		Silver Nitrate		Cryotherapy	
		Count	Percentage	Count	Percentage
First week	Symptomatic	3	10.00%	30	100.00%
	Non-symptomatic	27	90.00%	0	0.00%
Second week	Symptomatic	3	10.00%	17	56.70%
	Non-symptomatic	27	90.00%	13	43.30%
First month	Symptomatic	4	13.30%	2	6.70%
	Non-symptomatic	26	86.70%	28	93.30%
Second month	Symptomatic	4	13.30%	2	6.70%
	Non-symptomatic	26	86.70%	28	93.30%

Table 7b: value on each month of follow-up

Follow up	First week	2nd week	1st month	2nd month
Chi-square	49.091	14.7	.741	.741
DF	1	1	1	1
P Value	.00	.00	.389a	.389a

It was observed that most patients who were going to be treated with cryotherapy presented with white vaginal discharge (90%) about 26.6% also presented with lower abdominal pain, 16.6% also had back pain and about 3.33% also presented with intermenstrual bleeding & all patients who were going to be treated with silver nitrate cauterization presented with white vaginal discharge (100%) about 30% presented with lower abdominal pain, 6.66% had back pain and no patient had intermenstrual bleeding

Table 8: Chief complaints of patients of cervical erosion who were treated with Cryotherapy& silver nitrate

Chief complaint	cryotherapy%	Silver nitrate%
White vaginal discharge	90	100
Lower abdominal pain	26.6	30
Back pain	16.6	6.66
Intermenstrual bleeding	3.33	0

It was observed that around 53% of the patients treated with

silver nitrate cauterization had no complaints while 40% did have pain in abdomen immediately after the procedure, about 3% were complaining white vaginal discharge for more than 14 days.

There were only 10% patients treated with cryotherapy who had no side effects, 16% complained of dizziness immediately after the procedure, 30% had lower abdominal pain and 46% had persistent white vaginal discharge for more than 14 days

Infertility: There were 2 patients of secondary infertility in cryotherapy group who conceived 2 months and 5 months after the procedure after a period of 6 years and 10 years respectively and 1 primary patient in silver nitrate group who conceived after a period of 6 months after the procedure after a period of 4 years which suggests that the procedure helps to overcome the cervical factor of infertility

Table 9: Side effects of the treatment given to two group of patients

Side effects	Silver nitrate%	Cryotherapy%
No complaints	53.33	10
Dizziness	0	16
Lower abdominal pain	40	30
White vaginal discharge<7 days	0	43.33
White vaginal discharge >7 days	3.33	46.6

It is seen that the patients who were treated with silver nitrate cauterization only required silver nitrate chalk while the patient treated with cryotherapy required a setup having cryotherapy unit, and nitrous oxide or carbon dioxide gas cylinder for its operation.

It was observed that the cost of cryotherapy equipment's was 60 times more than the cost of silver nitrate chalk

Table 10: Cost of both the procedures

Silver nitrate cauterization	Cryotherapy unit
Silver Nitrate chalk = Rs 1500 Half chalk used in the study	Cryo probe + gas cylinder (20,000) (10000) = Rs 30000+ 20000(two gas refills) =50000

Silver nitrate cauterization was faster (3 minutes) procedure as compared to cryotherapy (10 minutes) when equal time was given to patients for post procedure rest (20 minutes)

Table 11: Mean time taken for silver nitrate cauterization and cryotherapy

Silver nitrate cauterization= 23 minutes	Cryotherapy = 30 minutes
2 minutes preparation + 1minute application+20 minutes rest	2 minutes preparation+3 minutes application+ 5 minutes thawing+ 20 minutes rest

Table 12: Follow up results after silver nitrate Cautrization and cryotherapy after first week, second and First month

		Procedure Type				
		Silver Nitrate		Cryotherapy		P value
		Count	Percentage	Count	Percentage	
First week	Symptomatic	3	10.00%	30	100.00%	0.000
	Non-symptomatic	27	90.00%	0	0.00%	
Second week	Symptomatic	3	10.00%	17	56.70%	0.00
	Non-symptomatic	27	90.00%	13	43.30%	
First month	Symptomatic	4	13.30%	2	6.70%	0.67
	Non-symptomatic	26	86.70%	28	93.30%	
Second month	Symptomatic	4	13.30%	2	6.70%	0.67
	Non-symptomatic	26	86.70%	28	93.30%	

Discussion

The symptoms of cervicitis 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 [2, 21]. Several observations in the results of this study command attention. Many doctors refer for specialist treatment only those women in whom the erosion is associated with genitourinary symptoms. For example, Philip recommended that most erosion in non-puerperal women should be treated, whereas Townsend thought that treatment should be reserved for selected, symptomatic cases [22, 23].

In our study, we have treated with cryotherapy or silver nitrate cauterization in only women who presented with some complaints like white vaginal discharge, lower abdominal pain, back pain or intermenstrual bleeding and didn't respond to medical management. These women were treated with broad spectrum antibiotics and metronidazole. In present study, majority of cases were from lower socioeconomic status contributing to 90 percent. But this may be due to the fact that the institute predominantly caters to urban lower income groups where lack of personal hygiene, lack of knowledge & ignorance are often contributing factors. There was no selection bias and patients were enrolled serially as they were offered the therapy.

Our findings are comparable to those of Kulkarni and Durge Lower literacy, early sexual activity and high parity are contributory [24]. In present study, the age of the patients varied between twenty to forty years. Cervical erosion was found maximum in women with age group 26-35 years (66.66%) n=40/60. Its occurrence decreased with increase in age after 36 years 11.6% n =7). Four studies presented results stratified by age group. Results from Guijon suggest that older women were less likely to fail therapy, although the difference was not statistically significant.[26]Cervical erosion was found maximum in women with age group twenty-six to thirty in a study conducted by KatakdhondS *et al.*[6]

As per M J Goldacre *et al.* the prevalence of erosions increases with parity but when the effects of other factors were controlled, erosion decreased in women 35 and over [25].

In present study, 61.5% n=37 were multiparous, 35% n =21 were primiparous and only 2 patients were nulliparous. As per Goldacre, M. J., *et al.* parity had an independent effect: increased parity was associated with an increased prevalence of erosions. When the effects of parity and contraceptive method were taken into account the increased prevalence of large erosions in women aged 25 years and over (table I) was no longer apparent. Indeed, the prevalence of erosions of any size

was significantly lower in women aged 35 and over (2= 124; P < 0-01) than in younger women. Thus, age and parity exerted effects in opposite directions, with the prevalence of erosion tending to increase with parity in the fertile years but decrease with age [25].

Guijon found that neither the number of pregnancies (p=0.07) nor the number of live births (p=0.49) were significantly associated with treatment failures for cryotherapy or laser ablation combined [26]. Kwikkel reported a slightly higher cure rate for nulliparous women (91 percent) versus that for multiparous women (85percent) [27]. Vaginal discharge was the main complaint in this study.100% patients' complaint of white vaginal discharge, 28.3% also had lower abdominal pain, 10% patients also complaint of back pain and only 1 patient complaint of intermenstrual bleeding.

Table 13: Chief complaints seen in various studies

Study	Vaginal discharge	Lower abdominal pain	Back pain	Inter menstrual bleeding
Katakdhond S [6]	`100%	33%	5%	13%
KC Mohanty[28]	90%	32%	----	16%
Gay C, RiehlC[3]	92.30%	4.6	----	21.50%
Present Study	100%	28.3	10%	1.6%

Incidence of vaginal discharge and lower abdominal pain in present study is comparable with study by Katakdhond S, Mohanty and Gay C [6, 28, 3]. Incidence of back pain in present study is 10% and it was about 5% in the study conducted by Katakdhond S *et al.*[6]

A total of 68 patients were included in the study initially, they were divided into two groups. The healing rate of cervical erosion when treated with silver nitrate and cryotherapy were compared and it was observed that both were equally effective, healing rate of erosion by cryotherapy was 93.3% and by silver nitrate was 86.7% with (p value of 0.67). The healing rate of cervical erosion when treated with silver nitrate is comparable to the study Mattson *et al.* which explains 100% cure rate when erosion is treated with silver nitrate cauterization [21].

In our study symptomatic relief was earlier (within 7 days) when treated with silver nitrate cauterization than with cryotherapy which was > 14 days.

Table 14: Compares the healing rates in various studies.

Studies and efficacy on treatment with cryotherapy	
(1974) Peck [32]	91%
(1976) Szemesi [11]	97%
(1985) Mohanty [28]	98%
(1989) Wojtys [15]	95.30%
(1991) Alvarez [33]	92%
(1993) Guijon [26]	94.60%
(2006) Gay [3]	95.20%
(2017) Katakdhond S [6]	96%
Present study	93.3%

It was observed that around 53% of the patients treated with silver nitrate cauterization had no side effects while 40% did have pain in abdomen immediately after the procedure, about 3% were complaining white vaginal discharge for more than 14 days.

There were only 10% patients treated with cryotherapy who had no side effects, 16% complained of dizziness immediately after the procedure, 30% had lower abdominal pain and 46% had persistent white vaginal discharge for more than 14 days

Following cryotherapy, neither cervical stricture nor stenosis occurred, which is a remarkable advantage over the conventional thermo- or electrocautery.

In this study it was observed that the patients who were treated with silver nitrate cauterization only required silver nitrate chalk while the patient treated with cryotherapy required a setup having cryotherapy unit, and nitrous oxide or carbon dioxide gas cylinder for its operation. Silver nitrate cauterization was faster (3 minutes) procedure as compared to cryotherapy (10 minutes) when equal time was given to patients for post procedure rest (20 minutes the cost of cryotherapy equipment was 20 times more than the cost of silver nitrate chalk there were times when cryotherapy could not be done due to inoperability of the cryotherapy unit due to consumption of nitrous oxide gas.

Although it is said that electrocautery's efficacy for management of benign CE is not different from cryotherapy [29], it has some disadvantages like risk of burning lesions if the safeguard plate is not located correctly, and it cannot be used in people with metal prosthetic devices & stenosis of the cervix, which has been stated for cauterization more than cryotherapy, has not been proved by evidence-based documents. Some authors compared ultrasound with a laser. Both methods appeared effective in relieving symptoms of benign CE with fewer side effects using the laser[30,31]Obviously, the need for expensive facilities and professional experts are considered disadvantages. Other investigators examined several modalities and declared infrared coagulation was safer than electrocautery and laser, but the latter were more effective for ablation of CE. They believed that impossibility of pointed ablation accounts for a disadvantage regarding cryotherapy

Compared to laser therapy cryotherapy has a better learning curve but requires functional gas cylinder when compared to silver nitrate cauterization it is cheaper and easy to use in an outpatient setting with less investments on instruments.

Summary

An observational prospective study was carried on 60 patients coming to a tertiary care hospital in outpatient department. It was observed that cervical erosions were more common in age group of 26-35 years. It was more common in multiparous women. All the patients complained of white vaginal discharge. 28.3% patients presented with lower abdominal pain. 10% presented with back pain and only 1 patient had complaint of inter menstrual bleeding. All three types of cervical erosion i.e., anterior, posterior and circumoral were all nearly equal numbers in the sample population. The age, the parity, the size and type of cervical erosions were comparable in the group of patients who underwent cryotherapy and silver nitrate cauterization. After treatment it was observed that there was a significant difference in first and second week follow up of patients treated with silver nitrate and cryotherapy. In the first week, the patients with silver nitrate cauterization responded better i.e., only three were symptomatic out of 30. While 100% who were treated with cryotherapy were symptomatic. Only after 1-month patients who had undergone cryotherapy were more comfortable. It was also observed that there was no difference in patients treated with cryotherapy and silver nitrate after one month. They both were

equally effective for cervical erosion management, however in terms of time, cost, equipment and skill silver nitrate appears quite promising to treat benign cervical lesion.

There were 2 patients of secondary infertility in cryotherapy group who conceived 2 months and 5 months after the procedure after a period of 6 years and 10 years respectively and 1 primary infertility patient in silver nitrate group who conceived after a period of 6 months after the procedure after a period of 4 years which suggests that the procedure helps to overcome the cervical factor of infertility. It was observed that around 53% of patients treated with silver nitrate cauterization had no side effects. 40% complained of lower abdominal pain immediately after the procedure and 3% had white vaginal discharge for more than 14 days. Only 10% patients treated with cryotherapy had no side effects. 46% had persistent white vaginal discharge for more than 14 days. 16% had complaint of dizziness immediately after the procedure and 30% had lower abdominal pain. The setup for cryotherapy of cervical erosion required cryotherapy unit and nitrous oxide gas which costed about 20 times more than the cost of only silver nitrate chalk. Silver nitrate cauterization is a faster procedure in comparison to cryotherapy.

Conclusion: Cryotherapy and silver nitrate cauterization are equally effective in treating cervical erosion. Silver nitrate cauterization is cheaper, has a better learning curve and is faster than cryotherapy

Proper functioning of cryotherapy requires proper function of the cryotherapy unit which consist of the cryo probe, the gas cylinder its timely refilling and the key The after-treatment side effects of cryotherapy are much more and for longer duration (vaginal discharge for >14 days) which leads to delayed satisfaction when compared to treatment with silver nitrate

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