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UNDERSTANDING OF PATHOPHYSIOLOGY OF CERVICITIS - CONCEPTUAL STUDY

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Abstract:

The number of putative etiological agents implicated in cervicitis is growing and includes Mycoplasma genitalium, herpes simplex virus, cytomegalovirus, bacterial vaginosis and Trichomonas. The potential role of cervicitis in HIV transmission has been highlighted. Increasing broad-spectrum antibiotic usage with associated emergence of antimicrobial resistance reinforces the need for targeted antibiotic therapies, or vaginal cream. Different antibiotics treat different types of infection including the management of cervicitis. As our understanding of the etiology and significance of cervicitis, particularly nonspecific cervicitis, improves, management will be refined. A standardized approach to cervicitis research, particularly with consensus of case definition, may facilitate outcomes that can be more generally applied in clinical practice. The term cervicitis is reserved to infection of the endocervix including the glands and the stroma. The infection may be acute and chronic.

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INTRODUCTION:

Most women with cervicitis have no symptoms. If symptoms are experienced, they may include abnormal vaginal discharge (drip); bloody spotting between menstrual periods; pain during or after vaginal sex and spotting after sex. Cervicitis may be accompanied by an infection of the urethra, the tube that empties the bladder and in these cases, symptoms may include burning or pain during urination. Cervicitis was first recognized as an important clinical entity in 1984 by Brunham et al.⁴

If you think you may have cervicitis, or if you've been exposed to a sexually transmitted infection that can cause cervicitis, such as chlamydia or gonorrhoea, your provider can do tests to see if you're infected, whether you have symptoms or not. Because cervicitis can be caused by sexually transmitted infections that require immediate attention such as chlamydia, herpes simplex virus and gonorrhoea, your provider may treat you with antibiotics even before final laboratory test results are back, just to be safe.⁸⁻⁹

If left untreated, cervicitis caused by a sexually transmitted infection can cause severe pain and permanent damage to the reproductive system, making it hard or impossible for a woman to get or stay pregnant. Infection of the cervix can also make it easier to get or spread HIV. If you think you have cervicitis, get examined and treated immediately to avoid any complications.

In the past several years, the collective understanding of cervicitis has extended beyond the recognition of *Chlamydia trachomatis* and *neisseria gonorrhoeae* as the prime etiologic suspects. New research into the etiology, immunology and natural history of this common condition is needed, especially in view of the well-established links between cervicitis and an increased risk of upper genital tract infection and human immune deficiency virus type 1 acquisition.

DEFINITION:

Cervicitis is an inflammation (irritation) of the lining of the cervix. The cervix is the tip of the uterus (womb), extends down into the vagina. Men have no cervix, and therefore cannot get cervicitis. However, men can get a similar inflammation in the tube of the penis, called urethritis. Cervicitis can be a sign of infection.

Common infections of the cervix include chlamydia and gonorrhoea. Although herpes virus can also cause cervicitis, it usually comes along with visible painful sores on the genital skin.

Acute cervicitis : ¹¹

The endocervical infection usually follows child birth, abortion or any operation on cervix. The responsible organisms are pyogenic.

The organisms gain entry into the glands of the endocervix and produce acute inflammatory changes. The infection may be localised or spread upwards to involve the tube or sideways involving the parametrium.

Chronic cervicitis: ¹¹

Chronic cervicitis is the commonest lesion found in women attending gynaecologic outpatient.

The endocervix is a potential reservoir for N.gonorrhoeae ,Chlamydia ,HPV,mycoplasma and bacterial vaginosis .

PATHOPHYSIOLOGY:¹⁻⁵

1. Typical organisms for acute cervicitis:

- a. C. trachomatis
- b. N. gonorrhoeae
- c. Trichomonas vaginalis
- d. Herpes simplex virus
- e. Mycoplasma genitalium
- f. Bacterial vaginosis (BV)

2. Chronic cervicitis : ¹¹

The mucosa and the deeper tissues are congested ,fibrosed,and infiltrated with leukocytes and plasma cells.the glands are also hypertrophied with increased secretory activity . Some of the gland mouths are closed by fibrosis or plugs of desquamated epithelial cells to cause retention cyst-nabothian follicles .it should be called chronic endocervicitis as the ectocervix is protected by the overlying stratified squamous epithelium , There is associated lacerated and everted endocervix ,the so called eversion or ectropian .

CLINICAL FEATURES: ¹¹

Acute cervicitis :

The vaginal examination is painful.

The cervix is tender on touch or movements .

Cervix looks edematous and congested .

Mucopurulent discharge is seen escaping out through the external os.

Chronic cervicitis :

There may not be any symptom as it may be accidentally discovered during examination .

Excessive mucoid discharge ,at times mucopurulent ,is the predominant symptom .

History of contact bleeding may be present .

On examination :

- a) The cervix may be tender to touch or on movement .

- b) Speculum examination reveals –mucoïd or mucopurulent discharge escaping out through the cervical os.
- c) There may be enlargement, congestion, or ectropion of the cervix.

INCIDENCE, PREVALENCE: ²⁻⁴

- a. Common problem in clinical setting
 - b. True incidence/prevalence difficult to measure due to variety of definitions
 - c. Women over age 30 at low risk to acquire sexually transmitted diseases (STDs)
3. Risk factors for STD
- a. Age \leq 25 years
 - b. New sex partner or multiple sex partners
 - c. Engage in unprotected sex
4. Morbidity / Mortality
- a. Risk of poor pregnancy outcome
 - b. Increased viral shedding in HIV patients
 - c. May be sign of upper genital tract infection (pelvic inflammatory disease)
 - i. endometritis
 - ii. salpingitis
 - iii. tubo-ovarian abscess
 - iv. pelvic peritonitis

DIAGNOSTICS:

1. History
- a. Vaginal discharge
 - b. Inter-menstrual bleeding (after intercourse)
 - c. Asymptomatic
2. Physical examination: both or either
- a. Purulent or mucopurulent endocervical
 - b. Endocervical bleeding easily induced by gentle passage of cotton swab through cervical os (friability)
3. Diagnostic testing by laboratory evaluation
- a. Chlamydial and gonococcal infection:
 - i. leukorrhea $>$ 10 WBC per high power field on microscopic examination of vaginal fluid
 - ii. nucleic acid amplification test (urine, vaginal or endocervical samples)
 - b. Trichomonias vaginalis on microscopic examination
 - a. sensitivity of microscopy to detect trichomonas - 50%
- vaginal candidiasis,
pelvic inflammatory disease.

4. Other studies

- a. Polymorphonuclear leukocytes on gram stain.
- b. Gram-negative intracellular diplococci on gram stain of fluid
 - i. specific for gonococcal infection
 - ii. not sensitive, PPV 21%
 - iii. only observed in 50% of women with infection
- c. HSV-2 by culture or serology

PROGNOSIS:

Acute cervicitis : ¹¹

- a) It may resolve completely
- b) The infection may spread to involve the adjacent structures or even beyond that
- c) Becomes chronic

1. Key differential diagnoses ¹⁻²

- a. C. trachomatis
- b. N. gonorrhoeae
- c. Trichomonas vaginalis
- d. Herpes simplex virus
- e. Mycoplasma genitalium
- f. Bacterial vaginosis

2. Extensive differential diagnoses ¹⁻²

- a. Irritant substance use
 - i. chemical douches
 - ii. spermicides (nonoxynol-9)
 - iii. chemical deodorants
 - iv. betadine
 - v. corn starch
 - vi. topical anesthetics
 - vii. vaginal lubricants
 - viii. latex
- b. Other infections
 - i. vulvovaginal candidiasis
 - ii. cytomegalovirus
 - iii. Streptococcus species
- c. Pelvic inflammatory disease
- d. Cervical intraepithelial neoplasia
- e. Abnormal host immune response attacking genital mucosa, eg. Psoriasis and Behcet syndrome

PREVENTION:

- Abstinence
- Limited number of partners
- Condom use –male/female
- Drink plenty of water
- Wear dry and clean underwear

TREATMENT: ¹⁻³

The patient usually complains of a purulent vaginal discharge. The muco-purulent secretions are not irritating, so there is no vulvar discomfort or intra-coital dyspareunia. Because gonococcal or chlamydial infection can involve the urethra, endometrium, oradnexa, there may be dysuria, abnormal uterine bleeding, lower abdominal pain, or pelvic dyspareunia. Gram- stained smears of cervical secretions confirm the presence of many leukocytes, and in gonococcal infection, may contain intracellular cocci. Culture or non-culture for *N. gonorrhoeae* and *C. trachomatis* should be performed.

1. Acute presumptive treatment
 - a. For *C. trachomatis*, if risk factors are present (especially if follow up not ensured)
 - i. Recommended regimen: Azithromycin 1 g orally in single dose OR doxycycline 100 mg orally BID for 7 days
 - b. Concurrent therapy for *N. gonorrhoea* if the prevalence of this infection is >5% (younger age groups, incarceration)
 - i. Recommended regimen: Ceftriaxone 250 mg IM in single dose OR cefixime 400 mg orally in single dose
2. Treatment for trichomoniasis if detected
 - a. Recommended regimen: Metronidazole 2 gm orally single dose OR tinadazold 2 gm orally single dose
3. Treatment for bacterial vaginosis if detected
 - a. Recommended regimen: Metronidazole 500 mg BID for 7 days OR metronidazole gel 0.75% 5 gm intravaginally daily for 5 days OR clindamycin cream 2% 5 gm intravaginally at bedtime for 7 days.
4. Acute cervicitis : ¹¹

High vaginal and endocervical swabs are taken for bacteriological identification and drug sensitivity test .

Appropriate antibiotic should be prescribed .

General measures are to be taken as outlined in acute pelvic infection .
5. Chronic cervicitis
 - a. Recurrent cervicitis
 - i. evaluate for possible re-exposure to STD

- ii. if STD excluded, BV not present and sex partners evaluated and treated - options limited
- b. Persistent cervicitis
 - i. symptoms despite repeated antibiotic courses
 - ii. likely not relapse or reinfection
 - iii. due to:
 - 1. abnormal vaginal flora
 - 2. douching
 - 3. exposure to chemical irritants
 - 4. idiopathic inflammation

Cervical scrape cytology to exclude malignancy is mandatory prior to any therapy .¹¹

- 1) there is no place of antimicrobial therapy except in gonococcal or proved cases of chlamydial infection or bacterial vaginosis.
- 2) The diseased tissue may be destroyed by electro or diathermy cauterization or laser or cryosurgery .

The ectropian is corrected by deep linear burns and the coincidental ectopy may be coagulated .

6. Management of sex partners
 - a. Empirical treatment for same STD as index patient is as or more effective than referral for exam and testing with chlamydia and gonorrhea (SOR:A)
 - b. Expedited treatment equivalent to test-first approach in trichomoniasis (SOR:B)
 - c. To avoid reinfection - patients and sex partners should abstain from intercourse for 7 days (completed treatment)
7. Special consideration: HIV
 - a. Same treatment regimens
 - b. Cervicitis increases cervical HIV shedding
 - c. Treatment of STD might reduce HIV transmission to susceptible partners

AYURVEDIC CORELATION:¹²

According to Ayurveda it is mainly due to vitiation of Kapha dosha as it is having whitish colour, picchilata & sometimes kanduta in nature, therefore it is known as shwet pradar in Ayurveda. The vaginal secretions are dependent on the endogenous oestrogen level, by increase in it there is abundant secretory activity of endocervical glands and vaginal epithelium. Therefore, there is emergence of indications like *Daah, Shoth, Shwetapradara*, etc leading to Cervicitis

AYURVEDIC TREATMENT:

In Stree Roga, Sthanik Chikitsa (Local therapies) have lot of prospective in treating Gynaecological disorders.

After reviewing all these local therapies, it seems that these are described according to disorders of Tryavarta Yoni (Vagina). Usually, Gynaecological Disorders are treated first by Shaman Chikitsa (Medicinal Treatment) and then Shodhan Chikitsa (Bio-purification Procedures) i.e. application of the five Purificatory Therapies - what is known as the Panchakarma. These are the procedures in Ayurvedic therapeutics which helps in getting rid of different ailments.

These procedures are done by following specific protocols of: -

1. Purva karma
2. Pradhan karma
3. Paschat karma

Besides this, procedures there are some Sthanik Chikitsa (Local Treatment) in Stree Roga described by Ancient Acharyas: -

<i>Sthanik Chukitsa</i>	Meaning	<i>Sthana</i>	Duration
<i>Yoni Dhawan</i>	aginal Washing	<i>Prathamavarta</i>	1 – 2 minutes
<i>Uttarbasti</i>	Insertion of Medicated oils and decoctions into Intra Uterine Cavity	<i>Prathamavarta</i>	Artavakala & Ritukala
<i>Yoni Picchu</i>	Insertion of Tampons soaked in medicated oils or liquids.	<i>Prathamavarta</i> <i>Dwitiyavarta</i>	-
<i>Yoni Dhupana</i>	Fumigation of Vagina	<i>Bahya Yoni</i>	3 – 5 minutes
<i>Yoni Lepana</i>	Painting of Vagina	<i>Prathamavarta</i>	3 – 4 hours
<i>Yoni Varti</i>	Suppositories for Vagina	<i>Prathamavarta</i>	2 – 3 hours
<i>Yoni Purana</i>	Vaginal Cavity filling.	<i>Prathamavarta</i>	-
<i>Yoni Parisheka</i>	Fomentation to the external part of vagina.	<i>Bahya Yoni</i>	5 – 10 minutes
<i>Pinda Chikitsa</i>	Insertion of circular paste of boiled drugs into vagina.	<i>Prathamavarta</i>	3 – 4 hours

Acc to ayu.:

- a) Ashoka: due to its kashya rasa and katuvipak ,it decreases the secreartion.
- b) Uttarbasti of babul twakkwath
- c) Yonidhavan –panchvalakal kawath

d) Pushanug churna along with tandulodaka

DIET:

- 1) Fresh fruits and vegetables should be part of daily diet
- 2) As it is kaphapradhan disease the diet must be laghu (light),ushna(hot)in order to balance the kaphadosha.
- 3) A well balanced diet comprising of foods rich in fiber ,protein,carbohydrate and essential nutrients not only treat the cervicitis but also prevent reoccurrence.
- 4) Daily eat one banana dipped in butter .
- 5) Intake of canberry juice

Avoid: meat,spicy food ,alcohol excessive,drinking of tea,and coffe

CONCLUSION:

Although our understanding of cervicitis and its pathogenesis has advanced considerably in the past 2 decads ,many area of uncertainty still remain.

Cervicitis increases the risk of poor pregnancy outcome ,predicts upper genital tract disease ,and is associated with increased shedding of HIV-1 from the cervix in the absence of chlamydial and gonococcal infection ,determining the etiology of this condition should be a priority .managementof cervicitis in women at relatively low risk for chlamydial or gonococcal infection ,or in setting where gonococcal disease is relatively uncommon is an important area for future study.

If you're diagnosed with a sexually transmitted infection of the cervix, it's important to tell everyone you've had sex with over the past 2 months, so that they can be examined and treated too. Take all your medication as directed, even if you feel better before the medicine is finished. Don't have sex until you and the people you've had sex with have been completely treated and all symptoms have disappeared, or you could infect each other again. Left untreated in pregnancy, cervicitis caused by a sexually transmitted disease can lead to premature labour and miscarriage. It can also cause infections in the eyes and lungs of the new-born. All pregnant women should be tested for sexually transmitted diseases (STDs), including HIV, as early as possible in pregnancy. You should be tested again during your pregnancy if you are at higher risk for getting an STD.

You are at higher risk if you have a new partner during pregnancy or if you have more than one partner. If left untreated, STDs can be devastating for your baby. To protect yourself and your baby against HIV and other STDs, use a latex condom whenever you have sex. Sexually transmitted infections can be avoided by not having sex. If you are sexually active, you can reduce your risk of getting infections of the cervix and most other sexually transmitted diseases (STDs), including HIV, by

having sex only in a mutually monogamous relationship with a partner you are sure is not infected. If you are having sex outside of such a relationship, you can reduce your risk of STDs by:

- 1) Always using a latex condom (or other type of latex barrier) whenever you have sex – vaginal, anal, or oral. Condoms made of “natural” materials, such as lambskin, protect against pregnancy, but not against STDs. If you are allergic to latex, you can use condoms made of polyurethane or other synthetic materials.
- 2) Limiting the number of people you have sex with. The more partners you have, the higher your risk.
- 3) Avoiding alcohol and drugs when you have sex. Drinking or getting high makes it much harder to remember to use condoms to protect yourself and others.

Primary care physicians should be proficient in diagnosing and treating cervicitis, because these are among the most commonly encountered problems in the ambulatory care of women. Giving your doctor a chance to find infections that don't have symptoms is one reason it's so important to get regular check-ups, even when you're not feeling sick.

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