

Cervicitis

Learning Objectives

Upon completion of this content the learner will be able to:

1. List the etiologic agents of cervicitis.
2. Describe the clinical manifestations and sequelae of cervicitis.
3. State the clinical and laboratory criteria for the presumptive diagnosis of cervicitis.
4. Summarize the clinical management of cervicitis to include recommended diagnostic tests, treatment, follow-up, patient counseling, and partner management.

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Cervicitis

Inflammatory process in cervical epithelium and stroma which, when caused by certain infectious agents, can result in an ascending infection of the upper genital tract. Clinically, mucopurulent cervicitis (MPC) is characterized by a yellow or green endocervical exudate visible in the endocervical canal or on an endocervical swab specimen.

I. Etiology

A. Etiologies: general categories:

1. Infectious, including STDs:
 - a) *Neisseria gonorrhoeae* (GC).
 - b) *Chlamydia trachomatis* (CT).
 - c) Herpes simplex virus (HSV).
 - d) *Trichomonas vaginalis*.
 - e) Other possible etiologies: *Mycoplasma genitalium*, *Ureaplasma urealyticum*, viruses, *Treponema pallidum*.
2. Non-infectious
 - a) Neoplasia.
 - b) Trauma (mechanical).
 - c) Chemical irritant (douching, spermicides).
 - d) Systemic inflammatory disease (Behcet's syndrome).

B. The clinical significance of cervicitis varies in the population/setting in which the diagnosis is made:

1. In settings with a high prevalence of bacterial STD (e.g., many STD clinics or clinics with a CT prevalence of >8%), cervicitis may be an indication for therapy for chlamydia and/or gonorrhea.
2. In contrast, in settings with low prevalence of bacterial STD, cervicitis may be less likely to be due to STD pathogens and may indicate the need for testing, but not empiric treatment.
3. A significant proportion of cervicitis will be of unknown etiology.

II. Pathogenesis

A. Normal cervix:

1. Endocervix: composed of columnar epithelium.
2. Ectocervix: composed of squamous epithelium.
3. Squamo-columnar junction (SCJ):
 - a) Border between columnar and squamous epithelia.
 - b) Position of SCJ may vary.
 - c) Acidic vaginal pH after menarche induces squamous metaplasia, leading to SCJ "migration" toward cervical os and covering of portio with squamous epithelium.
 - d) Cervical ectopy (presence of columnar epithelium on the face of the os) is most notable during adolescent years, pregnancy, and exogenous estrogen therapy; recedes with progressive squamous metaplasia.
 - e) Colposcopically, metaplastic area between original and physiologic SCJ called "transformation zone"; all CIN/SIL (dysplasia) starts in this area.
4. Cervical mucous:
 - a) Functions: sperm transport; physical barrier.
 - b) Responds to hormonal influence: thinner and more copious in response to progesterone-dominant hormonal milieu, so affected by menstrual cycle and hormonal contraceptives.

B. Infectious causes of cervicitis:

1. Endocervicitis: generally caused by gonorrhea, chlamydia, or HSV.
2. Ectocervicitis: causes include trichomonas, HSV, syphilis (rare).

C. Other causes of cervical abnormalities:

1. Nabothian cysts: islands of active columnar epithelium covered by metaplastic squamous epithelium, which are seen as small "pearly white" or "blue-domed" cysts within transformation zone.
2. Columnar epithelium of ectopy is relatively fragile and may bleed after intercourse, Pap smear, or other mechanical trauma.

3. Erosio vera:
 - a) Cervical ulceration due to trauma.
 - b) Almost always asymptomatic.

4. Cervical growths:
 - a) Condylomata: usually multiple and caused by HPV.
 - b) Polyps: smooth, red/flesh-colored pedunculated growths found both at the endo- and exo-cervix. Most are benign but all should be removed and submitted for pathologic examination.

5. Cervical cancer:
 - a) Usually appears as a fungating lesion, although may present as ulcer or leukoplakia.
 - b) Larger lesions often associated with intermenstrual, post-coital, or post-menopausal bleeding, or blood-tinged discharge.

6. Leukoplakia:
 - a) "White plaque" on ectocervix, visible with the naked eye.
 - b) Most due to HPV infection (condylomata), but may be due to hyperkeratosis, CIN, or cervical cancer.
 - c) Must be evaluated by colposcopy and biopsy, regardless of Pap smear results.

III. Clinical Manifestations

- A. Symptoms: generally lack specific predictive value, but may include:
 1. None (asymptomatic infection).
 2. Abnormal vaginal discharge of any color or consistency.
 3. Abnormal bleeding, especially post-coital.
 4. Dysuria (which can be seen in patients with simultaneous infection of the urethra).

- B. Signs on physical examination:
 1. Endocervicitis:
 - a) Mucopurulent (green, yellow, or opaque) discharge visible in endocervical canal or on an endocervical swab specimen.

- b) Easily induced endocervical bleeding ("friability").
 - c) Polymorphonuclear leukocytes (PMNs) on Gram stain of endocervical secretions. The use of PMNs or cut-off number of PMNs in clinical decision-making is controversial. Although some experts consider an increased number of PMNs (i.e. >30 PMNs/high power field, i.e., oil immersion, 1000x) on endocervical Gram stain as being useful in making a diagnosis of clinically significant cervicitis, this criterion has not been standardized (no standardized cut off of number of PMNs) and has a low positive predictive value. In populations with a high prevalence of chlamydia or gonorrhea, such as STD clinics, the presence of MPC may be an indication for therapy, whereas in low prevalence populations it may indicate the need for testing but not for empiric treatment.
2. Ectocervicitis:
- a) Edematous ectopy.
 - b) General erythema.
 - c) Discrete lesions (ulcers, erosions).
 - d) Cervical petechia- "strawberry cervix" seen with 1-2% of women with vaginal trichomoniasis (up to 45% if examined by colposcopy); always accompanied by vaginitis.

IV. Diagnosis

A. Examination of the cervix:

1. Wipe mucus away from ectocervix, then observe for mucopurulent endocervical discharge, erythema, ulceration, edema, edematous ectopy, leukoplakia.
2. Swab test: insert white cotton-tip swab into the os (i.e., endocervix); positive = yellow or green pus on swab, negative = cloudy or clear mucus; friability = blood on swab.
3. Obtain slide for Gram stain of endocervical secretions (optional).
4. Obtain endocervical samples for gonorrhea and chlamydia testing. Endocervical cells, not just discharge, should be obtained for adequate chlamydia testing, which generally requires rotation of the swab within the cervical os while applying gentle lateral pressure in order to obtain an adequate sample.

B. Diagnostic laboratory tests:

1. Cervical tests:

- a) Swab #1: GC diagnostics.
- b) Swab #2: chlamydia diagnostics.
- c) Swab #3: Pap smear (if indicated).
Some recommend collecting Pap smear prior to CT test, but presence of blood may interfere with some CT testing.
- d) The presence of mucopurulent discharge should not delay Pap testing. It can be obtained after careful removal of the discharge with a saline-soaked cotton swab.

2. Refer to Diagnostics section in the GC and CT syllabi.

V. Treatment

A. In general, the results of tests for *C. trachomatis* or *N. gonorrhoeae* (e.g., culture or nucleic acid amplification tests) should determine the need for treatment; however, presumptive treatment may be indicated in some situations.

B. Empiric management:

1. Indications: empiric treatment should be considered for a patient presenting with signs and/or symptoms consistent with gonorrhea and/or chlamydia if:
 - a) The prevalence of these diseases is significant among women with mucopurulent cervicitis in the given setting, **or**
 - b) The patient might be difficult to locate for treatment once referral laboratory testing results are found to be positive, **or**
 - c) The patient's risk profile (young age, high risk sexual history) raises concern.
2. Empiric treatment regimens for mucopurulent cervicitis (MPC): if the decision to provide empiric treatment is made, the regimen should include coverage for chlamydia and gonorrhea. Single dose regimens have the important advantage of improved compliance through directly observed therapy. Although MPC can be caused by *C. trachomatis* or *N. gonorrhoea*, in most cases neither organism can be isolated. MPC can persist despite repeated courses of antimicrobial therapy.
3. Confirmatory testing: confirmatory testing for GC and chlamydia should be performed at the time of empiric treatment given the advantages of making a

specific diagnosis, including improved compliance with treatment and partner notification.

- C. Persistent cervicitis: after the possibilities of relapse and reinfection have been ruled out (by history or by using a sensitive test for GC and CT), management of persistent or noninfectious MPC is unclear. Additional antimicrobial therapy may be of little benefit and other causes of cervical inflammation should be considered. Differential includes:
1. Noninfectious etiologies (chemical irritants).
 2. Vaginitis (trichomonas).

VI. Prevention – Patient education:

A. Partner management:

1. Management of sex partners of women treated for MPC should be appropriate for the identified or suspected STD. Partners should be notified, examined, and treated for the STD identified or suspected in the index patient.
2. Patients and their sex partners should abstain from sexual intercourse until therapy is completed (i.e., 7 days after a single-dose regimen or after completion of a 7-day regimen).

B. Patient counseling and education:

1. Nature of the infection
 - a) Explain cervicitis as a syndrome vs. infection, limitations of the criteria or testing used to make the diagnosis (e.g. <100% specificity), specific disease etiology if known, routes of transmission and acquisition, and reasons for treatment, need for optimal compliance, and sequella possible with persistent or inadequately treated infection (e.g. PID/infertility/ectopic pregnancy; increased HIV susceptibility).
 - b) Explain need for referral/treatment of sex partners to establish etiology and possible treatment. A specific diagnosis of STD should prompt treatment of partners.
2. Risk reduction:

Advise against douching given its association with bacterial vaginosis, PID and its complications. Explanations posited for the ill effects of douching include: alteration of the vaginal microflora; removal of protective components of the vagina or cervix; and promotion of ascension of organisms from the lower to the upper reproductive tract.

VII. References

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