VAGINITIS

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Learning Objectives

• Describe the characteristics of normal vaginal discharge.
• Understand the epidemiology and the common risk factors associated with vaginitis and cervicitis.
• Describe the clinical presentations of common forms of vaginitis and cervicitis.

Normal Vaginal Discharge

• Normal vaginal discharge is clear to white, odorless, and of high viscosity.
• The vagina is a dynamic ecosystem that includes multiple forms of bacteria.
• Normal bacterial flora is dominated by lactobacilli – other potential pathogens present.

Learning Objectives

• Describe diagnostic approaches to vaginitis and cervicitis.
• Understand CDC recommended treatments for vaginitis, cervicitis
• Summarize counseling and prevention strategies for women diagnosed with vaginitis and/or cervicitis.
Normal Vaginal Histology

- Other bacteria commonly found in the vagina include:
  - streptococcal species
  - Gram-negative bacteria
  - *G. vaginalis*
  - Anaerobes

Normal Vaginal Discharge

- Lactic acid helps to maintain a normal vaginal pH of 3.8 to 4.2.
- Acidic environment and other host immune factors inhibit the overgrowth of bacteria.
- Stratified squamous epithelium produce glycogen, due to estrogen stimulation

Wet Prep: Common Characteristics

- RBCs
- Squamous epithelial cell
- PMN
- Sperm
- Artifact

Presentation of Vaginitis

- Characterized by vaginal discharge, vaginal itching/irritation
- Vaginal odor often present
- Occasionally asymptomatic
- Common types are bacterial vaginosis (40-45%), vulvovaginal candidiasis (20-25%), trichomoniasis (15-20%)
Clinical, economic issues

- Over six million health care visits each year are attributed to vaginitis
- Over one billion dollars are spent annually for the care and treatment of vaginitis
- Vaginitis may increase one's risk of HIV

Epidemiology-BV

- Most common form of vaginitis
- Prevalence varies by population with high rates (up to 60%) among STD patients
- Low to moderate rates (15-25%) among college students.

Vaginitis Differentiation

<table>
<thead>
<tr>
<th>Symptom presentation</th>
<th>Normal</th>
<th>Bacterial Vaginosis</th>
<th>Candidiasis</th>
<th>Trichomoniasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor, discharge, itch</td>
<td>Ichy, nondescript, dysuria, thick discharge</td>
<td>Ich, discharge, 50% asymptomatic</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Vaginal discharge</th>
<th>Normal</th>
<th>Bacterial Vaginosis</th>
<th>Candidiasis</th>
<th>Trichomoniasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear to white</td>
<td>Homogenous, adherent, thin, milky white, malodorous &quot;foul fishy&quot;</td>
<td>Thick, clumpy, white &quot;cottage cheese&quot;</td>
<td>Frothy, gray or yellow-green, malodorous</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical findings</th>
<th>Normal</th>
<th>Bacterial Vaginosis</th>
<th>Candidiasis</th>
<th>Trichomoniasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflammation and erythema</td>
<td>Cervical petechiae &quot;strawberry cervix&quot;</td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Vaginal pH</th>
<th>Normal</th>
<th>Bacterial Vaginosis</th>
<th>Candidiasis</th>
<th>Trichomoniasis</th>
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</thead>
<tbody>
<tr>
<td>3.8 - 4.2</td>
<td>&gt; 4.5</td>
<td>Usually &lt; 4.5</td>
<td>&gt; 4.5</td>
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</table>

<table>
<thead>
<tr>
<th>KOH &quot;whiff&quot; test</th>
<th>Normal</th>
<th>Bacterial Vaginosis</th>
<th>Candidiasis</th>
<th>Trichomoniasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>Positive</td>
<td>Negative</td>
<td>Often positive</td>
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</table>

<table>
<thead>
<tr>
<th>NaCl wet mount</th>
<th>Normal</th>
<th>Bacterial Vaginosis</th>
<th>Candidiasis</th>
<th>Trichomoniasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lacto-bacilli</td>
<td>Clue cells (&lt; 20%), no/few WBCs</td>
<td>Few WBCs</td>
<td>Mobile flagellated protozoa, many WBCs</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KOH wet mount</th>
<th>Normal</th>
<th>Bacterial Vaginosis</th>
<th>Candidiasis</th>
<th>Trichomoniasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Pseudohyphae or spores if non-albicans species</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Epidemiology-BV

- 22.7% AA women, 8.8% Caucasians, 6.1% Asian women
- Pathogenesis- unclear, little or no inflammation, lactobacilli replaced with mixed flora, lack of acidity promotes growth of anaerobes, anaerobes inhibit WBC chemotaxis
**Risk Factors - BV**

- Two or more sex partners in previous six months/new sex partner
- Douching
- Lack of barrier protection
- Absence of or decrease in lactobacilli

**Bacterial Vaginosis**

- Etiology - *G. vaginalis*, Mobiluncus, other anaerobes include Prevotella, Bacteroides, Fusobacterium, genital mycoplasmas

**Bacterial Vaginosis**

- Clinical Features - 47-50% asymptomatic
- Amsel's criteria - 3 out of the following 4
  - Malodorous, thin vaginal discharge
  - pH > 4.7
  - clue cells > 20% of epithelial cells
  - positive amine or Whiff test (using 10% KOH)

**Bacterial Vaginosis**

- Nugent's criteria - quantifies the different bacteria present on gram stained vaginal fluid sample
- Based upon the gold standard laboratory method for diagnosing BV
- Not commonly used in STI Clinics
Bacterial Vaginosis

Wet Prep: Bacterial Vaginosis

Saline: 40X objective

Clue cells

NOT a clue cell

Source: Seattle STD/HIV Prevention Training Center at the University of Washington

Bacterial Vaginosis Curriculum Diagnosis

Bacterial Vaginosis

• Treatment- CDC STD treatment guidelines 2010
• Metronidazole 500 mg po bid for 7 days OR metrogel 0.75% 1 appl once for 5 days OR Clindamycin 2% intravaginal cream 1 appl once for 7 days are recommended
Alternative Treatment - BV

- Tinidazole 2 grams po x 5 days
- Tinidazole 1 gram po x 7 days
- Metronidazole 750 mg extended release, as a single dose
- Limited data on these alternatives

Alternative Treatment - BV

- Clindamycin 300 mg po bid for 7 days OR clindamycin ovules 100 mg intravaginal once for 3 days
- Clindamycin is oil based - do not to use latex condoms
- Metronidazole 2 g single dose is no longer recommended b/c low efficacy

Pregnancy and BV

- Treat all symptomatic women and women at risk for pre-term delivery
- Do not use topical agents
- Can use Metronidazole in all trimesters
- Metronidazole 500 mg bid OR 250 mg po tid X 7d OR clindamycin 300 mg po bid X 7d

Bacterial Vaginosis

- Sequelae of untreated BV - preterm labor, premature rupture of membrane, post abortal endometritis, post partal endometritis, higher risk of PID, increase in acquisition of HIV
- Benefits of treatment - reducing incidence of above sequelae, reducing symptoms, reduce risk in acquisition of other STIs and HIV
Management

• Data are conflicting whether treating asymptomatic pregnant women at low risk reduces adverse fetal outcome
• Metronidazole 2 gm dose does not reduce preterm birth even with repeated doses

Management

• Sex partner management- No treatment required
• ? Treat asymptomatic women
• No definitive recommendation
• Consider treatment if: previous history of PID, high risk of acquiring GC/CT, previous history of post-partum or post-abortal pelvic infections.

Recurrent BV

May repeat treatment for recurrences

Multiple recurrences:
• Twice weekly metronidazole gel for 6 months may reduce recurrences
• Treatment of sex partner is not advised
• Consistent condom use may be of benefit.

Trichomoniasis

• Most common treatable STI.
• Transmission is almost exclusively sexual
• May survive 45 mins in bath water, wash clothes or toilet seats
Epidemiology- TV

- Incidence estimates: 1 million new infections annually
- 28% women in STD clinics
- 20-30% among incarcerated women
- Inconsistent condom use, failure to use condoms

Trichomoniasis

- Pathogenesis- inflammatory vaginitis caused by a protozoan *Trichomonas vaginalis*
- Maximum growth at pH 4.9-7.5
- Motile at high pH
- Less prominent signs & symptoms at low pH
- Kills and ingests lactobacilli

Trichomoniasis

- Clinical Features- ranges from asymptomatic to severe vaginitis
- Purulent vaginal discharge
- Abnormal vaginal bleeding/post coital bleeding
- Vulvar edema, erythema
- Dyspareunia, pruritis
Wet Prep: Trichomoniasis

Saline: 40X objective

*Trichomonas shown for size reference only - must be motile for identification

Seattle STD/HIV Prevention Training Center at the University of Washington

Trichomoniasis Curriculum

Diagnosis

- Saline wet prep of vaginal fluid, to look for motile trich, sensitivity is about 60-70%, pH is usually >5
- Culture on Diamond medium is gold standard
- PCR on vaginal fluid is available (90-97% sensitivity)

Trichomonas NAAT Tests

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaginal swab</td>
<td>100%</td>
<td>99.0%</td>
</tr>
<tr>
<td>Endocervical swab</td>
<td>100%</td>
<td>99.4%</td>
</tr>
<tr>
<td>Urine</td>
<td>95.2%</td>
<td>98.9%</td>
</tr>
</tbody>
</table>

Management

- Treatment- CDC STD treatment guidelines 2010
- Recommended regimen is metronidazole 2 gm po X 1 dose OR tinidazole 2 gm po
- Alternative- metronidazole 500 mg po bid X 7d
- Must treat all sex partners
Management

- Sex partner management - all contacts should be treated
- Note: Patients should be counseled to refrain from sexual intercourse until all partners have been treated and symptoms have subsided.

Resistant Infections

- Resistant trichomonas infections - defined when there is documented treatment failure
- May repeat treatment
- Verify all partners are treated
- May give metronidazole 2 grams QD x5 days
- Send specimen for culture and MIC determination and notify health dept. if treatment fails.

Pregnancy & TV

- Use metronidazole (tinidazole is contraindicated at the present time)
- 30% low birth weight
- 40% premature birth and low birth weight
- Two fold increase in risk of still birth and neonatal death
- Disulfiram reaction - flushing, sweating, palpitation, dyspnea - if ETOH taken within 24 hours of metronidazole ingestion

Epidemiology - VVC

- Affects most females during lifetime
- Most cases caused by *C. albicans* (85%-90%)
- Second most common cause of vaginitis
- Estimated cost: $1 billion annually in the U.S.
Vulvovaginal Candidiasis (VVC)

- Inflammatory vaginitis and, if vulvar area is involved, vulvitis
- Etiology: C. albicans 80-92%
- C. glabrata
- Candida is normal flora of the vagina
- 20% women are colonized with Candida

Classification of VVC

- Uncomplicated- sporadic or infrequent, mild to moderate, likely to be C. albicans, non-immunocompromised host
- Complicated- recurrent, severe, non-albicans species, uncontrolled diabetes, debilitation, pregnancy, other immune suppression

Risk Factors

- oral contraceptive users
- pregnancy
- antibiotic use
- steroid use
- uncontrolled diabetes
- prior history of candida infections

Clinical Manifestations

- Pruritis
- vaginal irritation, vaginal discharge
- vulvar edema/excoriation
- dysuria, dysparenuia
- fissures
**Vulvovaginal Candidiasis**

Source: Health Canada, Sexual Health and STI Section, Clinical Slide Gallery

**Diagnosis**

- Diagnosis: clinical exam, pH <4.5 (pH can be high with co-infections with TV or BV), KOH prep budding yeast and/or pseudo-hyphae, 50% may have negative microscopy, culture is gold standard
- Pregnancy and VVC- Use topical azoles, avoid fluconazole, therapy for 7 days is adequate

**Treatment**

- Uncomplicated- OTC (butaconazole, clotrimazole, miconazole 3,7 day regimens)
- Single dose butaconazole available
- Other azoles- terconazole (non-OTC)
- Oral agent- fluconazole 150 mg po once
Management

• Complicated- recurrent VVC (4 or more episodes in a year), 7-14 days of topical azole or fluconazole 150 mg 2 doses 3 days apart
• Maintenance- clotrim. 500mg vag supp once a week, ketocon. 100 mg od, flucon. 150mg once a week, itracon. 400mg once a month or 100mg once a day

Management

• 30-40% will have recurrent disease when maintenance is discontinued
• Severe VVC: same regimen
• Non-albicans: 7-14 days of non-fluconazole azole, boric acid 600 mg intravaginal once daily for 2 weeks

CERVICITIS

Definitions

• Endocervicitis- also known as mucopurulent cervicitis (MPC)
• Inflammation of the cervical epithelium
• Yellow/Green exudate visible in the endocervical canal OR yellow exudate on the endocervical swab
• Other features- edema/erythema of the zone of ectopy
Mucopurulent Cervical Discharge
(Positive swab test)

Definitions

- Easily induced cervical bleeding
- Zone of ectopy: exposed columnar epithelium
- Without inflammation, MPC, or colposcopic epithelial abnormalities, ectopy is a normal finding

Chlamydial Cervicitis

Gonococcal Cervicitis
Endocervicitis Etiology

- *C. trachomatis*, *N. gonorrhcea*, HSV
- Others: Mycoplasma, ? Ureaplasma
- No infectious etiology is identified in a significant number of these cases.

Ectocervicitis Etiology

- Ectocervicitis- *T. vaginalis*, HSV, Candida, CMV
- Non-infectious: trauma (chemical or mechanical), neoplasia.

Epidemiology

- Percentage distribution of the causes of MPC
  - No infection- 38%
  - CT- 15%
  - GC- 8%
  - HSV- 6%
  - Multiple etiologies- 1-5%

Chlamydia—Rates by Region, United States, 2001–2010

- Rates per 100,000 population
Gonorrhea—Rates, United States, 1941–2010

Clinical Features

- Majority of women with cervicitis are asymptomatic
- In high incidence areas for GC/CT, STIs would be the most likely causes
- Nonspecific symptoms include intermenstrual bleeding, abdominal cramps, vaginal discharge

Risk Factors

- Previous history of STIs
- Partner diagnosed with urethritis and/or any other STI
- Multiple sex partners
- Unsafe sex practices
- Drug use (substance abuse problems)
- OCP use, young age

Chlamydial Cervicitis
Mucopurulent Cervical Discharge
(Positive swab test)

Source: Seattle STD/HIV Prevention Training Center at the University of Washington/
Claire E. Stevens and Ronald E. Roddy

Diagnosis

• Clinical- very difficult, utilized where there are no lab facilities or if patient is high risk
• Clues for clinical diagnosis- friability of cervix, mucopus in endocervical canal, change in color of endocervical swab

Diagnosis

• Laboratory- Endocervical Gram stain-
low sensitivity and specificity
• No. of pmns/oil-immersion field
• More than 20 pmns may be suggestive of cervical inflammation
• Not routinely obtained in most clinics
• Low Positive Predictive Value (PPV)

Diagnosis

• Nucleic acid tests- DNA detection e.g genprobes, DNA amplification e.g PCR/LCR (NAAT)
• Higher sensitivity and specificity
• PCR/LCR- sens/spec up to 98-99%
Chlamydial Inclusion Bodies

Gram Negative Intracellular Diplococci

Complications

• Untreated GC/CT cervicitis can result in pelvic infections, Bartholin gland abscesses, infertility, disseminated gonococcal infections

Treatment

• Treat patients with cervicitis for both GC and CT
• All partners should be evaluated and treated as contacts to MPC.
Management

- Ceftriaxone 250 mg IM once OR
- Cefixime 400mg po once PLUS
- Azithromycin 1 gm, single dose OR
- Doxycycline 100mg BID, for 7 days.
- Azithromycin 2 gm is effective for GC but widespread use is discouraged

Chlamydia

- Azithromycin 1GM po once OR
- Doxycycline 100 mg po BID for 7 days
- Alternatives are- Erythromycin base 500mg po qid for 7 days, Erythromycin ethylsuccinate 800mg po qid for 7 days,

Management

- Ectocervicitis- manage according to etiology
- Partner Management-All partners within 60 days of onset of symptoms, or within 60 days of diagnosis should be evaluated and treated.
- If there is no sexual contact reported within 60 days of symptoms or diagnosis, the most recent partner should be evaluated and treated regardless of time of exposure.

Pregnancy

- Management of GC same as non-pregnant
- Recommended regimens for Chlamydia Azithromycin 1 GM po once OR Amoxicillin 500 mg po tid X 7 d
- Doxycycline is contraindicated
- Repeat testing 1-2 months after completion of treatment (1 mo. preferred)
Pregnancy

- Alternative regimens-
  - Erythromycin base 500mg po qid X 7d OR E-mycin base 250 mg po qid for 14 days,
  - Erythromycin ethylsuccinate-800 mg po qid for 7 days, OR 400 mg po qid for 7 days

Repeat Infection is Dangerous

- Repeat CT infection leads to higher risk of complications: PID, ectopic pregnancy, infertility
- Most infections are asymptomatic

Sequelae

- Untreated GC/CT infections may lead to:
  - Pelvic Inflammatory Disease
  - Bartholin gland abscess
  - Infertility
  - Disseminated Gonococcal Infection
  - Perinatal Infections- Pneumonia, Conjunctivitis,

Patient Counseling and Education

- Nature of the disease
  - Normal vs. abnormal vaginal discharge, signs and symptoms
- Transmission Issues- importance of partner evaluation and treatment
- Risk reduction
  - Avoid douching, avoid unnecessary antibiotic use, complete course of treatment, abstain from sex until treatment is complete
Patient Counseling, Education

- Risk of sequelae need to be reviewed for pregnant patients
- Risk for complications of cervicitis
- Follow-up for pregnant women, high risk patients.

Risk Reduction

The clinician should:
- Assess patient’s potential for behavior change
- Discuss individualized risk-reduction plans with the patient
- Discuss prevention strategies such as abstinence, monogamy, use of condoms, and limiting the number of sex partners
- Latex condoms, when used consistently and correctly, can reduce risk