Vaginitis

General Information

1. Most common gynecologic diagnosis in US
    - Six million office visits per year
2. Frequently self-diagnosed and self-treated
    - Over half of self-diagnoses are incorrect
3. Physician diagnoses are frequently incorrect without lab/culture confirmation
4. Mixed infections common
5. 90% of vaginitis caused by
    - Bacterial vaginosis: 40-50%
    - Vulvovaginal candidiasis: 20-25%
    - Trichomoniasis: 15-20%
6. Vaginitis vs. cervicitis
    - Important to distinguish
    - Cervicitis may present as vaginitis but may indicate more serious underlying pathology (eg, PID)
7. Hx, PE, and Dx studies necessary to establish Dx
    - Up to 40% incorrect diagnosis rate with Hx/PE only
8. Routine screening for Chlamydia infection of all sexually active women 25 years of age and younger, and other asymptomatic women at increased risk, is strongly recommended

Normal Vaginal Physiology

1. Normal discharge
    - White or transparent, thick, odorless
    - May become more pronounced at different times of menstrual cycle (eg, ovulation)
2. pH: 3.8-4.5
3. Flora
    - Mixed, predominately lactobacillus (produce lactic acid, some produce hydrogen peroxide which inhibits growth of bacteria and destroys HIV in vitro)
    - Also streptococcal species, gram-negative bacteria, *Gardnerella vaginalis*, and anaerobes. *Candida albicans* can be found in 10 to 25% of asymptomatic women.
4. Microscopy: predominance of squamous cells
    - Rarely leukocytes
    - Estrogen increases lactobacilli colonization by enhancing vaginal epithelial-cell production of glycogen

Diagnostics

1. History
    - chief complaint: vaginal discharge, smell, itching, pain or other discomfort
    - New sexual partner(s)
    - Medical history/Medications
    - Hygienic practices (douching)
    - Abdominal pain

- Urinary symptoms
- Vaginal symptoms

2. Physical exam
    - External genitalia
        - fissures, excoriations, erythema
    - Vaginal exam
        - Color, texture of mucosa
    - Discharge
        - Amount, consistency, color, odor
    - Cervix
        - Color, discharge from os, strawberry cervix (Trichomonas)
    - Bimanual exam (if patient with pain, suspect PID)
        - Cervical motion tenderness, adnexal ternderness/mass
    - Abdomen
        - Abdominal/suprapubic tenderness
3. Diagnostic testing
    - Vaginal ph
        - Normal: 3.8-4.5
        - Take sample from mid-vaginal wall, not posterior fornix
        - > 4.5 c/w trichomoniasis, bacterial vaginosis
    - Microscopy
        - Prepare two slides, one for normal saline wet prep, the other for KOH whiff +/- KOH prep
        - Normal: lactobacilli (long rods), epithelial cells
        - Clue cells >20% of epithelial cells suggests bacterial vaginosis
        - Tricomonads = T. vaginalis
        - WBCs = trichomoniasis, bacterial infection (e.g. GC, Chlamydia)
    - KOH test
        - KOH solution placed on slide w/sample, heat or wait 10 minutes
        - Makes hyphae easier to see
    - Gram stain
        - Gram-negative and Gram-variable rods and cocci (i.e., *G. vaginalis*, *Prevotella*, *Porphyromonas*, and peptostreptococci) and curved Gram-negative rods (*Mobiluncus*) characteristic of BV.
        - Long Gram-positive rods (lactobacilli) normal, healthy.
    - Whiff test
        - KOH releases characteristic amine/fishy odor when placed on sample
        - Positive with bacterial vaginosis; may be positive with T. vaginalis
    - Vaginal culture
        - Not useful for bacterial vaginosis
        - May be useful in candidiasis, T. vaginalis, or unusual pathogens (most sensitive test for Trichomonas)
        - Perform with any doubt of diagnosis, of infections refractory to treatment
    - STD cultures
        - Cervical cultures for STDs with any index of suspicion and routinely in patients age 25 and under

Differential Diagnosis

1. Key Differential Diagnosis
    - Bacterial vaginosis
        - Usually diagnosed by Amsel's criteria. Positive if *three* of the following *four* clinical criteria are met:
            - pH > 4.5
            - thin watery discharge
            - >20% clue cells (epithelial cells with coccobacilli obscuring the cell border)
            - positive "whiff" test (amine, or fishy odor present after addition of KOH)
        - Nugent criteria based on Gram's staining
        - Point-of-care tests not yet widely available
    - Vulvovaginal Candidiasis
        - Vulvovaginal erythema, up to 25% have fissures and excoriations on the external genitalia
        - Curdy, white discharge a specific finding, but not sensitive
        - pH usually normal (unless mixed infection)
        - Diagnosis confirmed if hyphae seen on KOH prep
        - Culture if diagnosis uncertain or resistant to treatment as may be non-albicans candidiasis
        - Recurrent candidiasis defined as four or more episodes per year--Culture advised.
    - Trichomoniasis
        - Yellowish, frothy discharge
        - May have vaginal erythema, "Strawberry cervix" in 2-5%
        - pH > 4.5
        - Motile trichomonads on wet prep
2. Extensive Differential Diagnosis
    - Vulvar dermatitis
        - Pruritus, erythema, dysparunia, +/- discharge (often misdiagnosed as Candida)
        - Irritants (eg, bubble baths, douches, perfumes, soaps, creams, synthetic or tight garments)
        - May be allergic reaction to latex ,spermicide, antifungal or steroid creams
        - In children, may be due to wiping anus back to front
        - Therapy
            - Withdraw offending agent(s)
            - Sitz baths
            - Topical barrier ointments (eg, petroleum jelly)
        - See also dermatology
    - Atrophic vaginitis
        - Generally seen postmenopausal
        - Secondary to decreased estrogen levels
        - pH usually increased (5.0-7.0)
        - Usually asymptomatic or mild dysparunia, irritation
            - Can present with severe discomfort

- Aerobic bacterial vaginitis
  - Usually severe with abundant purulent discharge
  - Culture is gold standard for diagnosis (Group A beta-hemolytic streptococcus, Group B streptococcus, Staphylococcus aureus, Escherichia coli, or other pathogenic organisms.)
  - Usually positive for strep, staph, and/or E.coli
  - pH > 4.5
- Desquamative inflammatory vaginitis
  - Abundant purulent discharge with vaginal ulceration
  - No positive cultures
  - No consensus regarding etiology
  - May respond to corticosteroids and/or topical clindamycin
- Foreign body (eg, tampon)
- Trauma
- Autoimmune diseases with dermatologic manifestations (lichen planus, Behcet's syndrome, pemphigus)
- Vulvar vestibulitis syndrome

Therapeutics

BACTERIAL VAGINOSIS

1. **Benefits of treatment:**
   - reduced symptoms
   - prevention of complications after abortion or hysterectomy
2. **Screening:**
   - Screening for bacterial vaginosis in low risk pregnant women is not recommended (grade D USPSTF)10, however some experts recommend screening patients at high risk for preterm delivery and treating before 20 weeks (Cochrane)[8]
3. **Recommended regimens (CDC)**[3]
   - Metronidazole 500 mg orally twice a day X7 days
     OR
   - Metronidazole gel 0.75%, one full applicator (5g) intravaginally, daily X5 days
     OR
   - Clindamycin cream, 2%, one full applicator (5g) intravaginally at bedtime X7days
   - **Alternatives**
     - Clindamycin vaginal ovules 100 mg, intravaginally QHS X3days
     - Clindamycin 300 mg orally twice daily X 7days
     - Tinidazole 2 gm orally daily x 2 days
     - Tinidazole 1 gm orally daily x 5 days
   - **Not recommended:**
     - Metronidazole 2 g single dose (lowest efficacy)
     - Tratment of partner

4. **Recurrent BV:**
    - A different regimen from original may be tried.
    - Suppressive therapy after successful treatment with metronidazole gel twice weekly reduced recurrences from 59.1% to 25.5% compared with placebo over a 16 week study period, however recurrence rates went up after suppressive treatment stopped and vaginal candidiasis was more common in treatment group.[11]
5. **Pregnancy**

   Oral therapy preferred in pregnancy because of the possibility of upper genital tract disease(CDC)[3]
    - Metronidazole 500 mg orally twice a day X7 days
      OR
    - Metronidazole 250 mg orally three times a day X7 days
      OR
    - Clindamycin 300 mg orally twice daily X 7days
6. **Follow-Up**
    - If symptoms persist

VULVOVAGINAL CANDIDIASIS

- any of the topical azole antifungals used according to dosing instructions
  OR
- fluconazole 150 mg single oral dose.
- Topical nystatin is not as effective
- a longer duration of therapy (7-14 days) of topical azole or two doses of oral fluconazole separated by 3 days.- for Severe vulvovaginal candidiasis or VVC in an immunocompromised host

1. **Recurrent Vulvovaginal Candidiasis.**
    - topical therapy X 7-14 days with then weekly for 6 months
      OR
    - fluconazole (100, 150, or 200 mg dose) q 3 days for 3 doses then one dose weekly for 6 months(CDC)[3]
2. **Pregnancy**
    - Only topical azole therapies are advised for use in pregnancy. Fluconazole is category (C) as it has not been shown to be safe in pregnancy
3. **Non-albicans Vulvovaginal Candidiasis**
    - 7-14 days of treatment with a topical or oral non-fluconazole azole medication.
    - If treatment fails or recurrence use Boric Acid 600 mg in a gelatin capsule once daily X 14 days.
4. **Follow-up**
    - For uncomplicated vulvovaginitis follow-up if treatment unsuccessful for re-evaluation and possible culture.
    - For complicated vulvovaginitis follow-up to be sure symptoms have resolved.

AEROBIC VAGINITIS

- Clindamycin cream, 2%, one full applicator (5g) intravaginally at bedtime X7days
- Oral penicillin effective for streptococcal infections.

1. **Desquamative inflammatory vaginitis**
   - No concensus. Clindamycin topical and steroids both reported effective[12]
2. **Atrophic Vaginitis**
   - Estradiol creams, pessaries, tablets and the estradiol vaginal ring . However evidence for systemic absorption and risk of endometrial cancer needs to be considered
   - Bioadhesive vaginal moisturizer (Replens) was a safe and effective alternative to topical estrogen.[13]

TRICHOMONIASIS

1. **Recommended**
   - Metronidazole 2g orally in a single dose
     OR
   - Tinidazole 2 g orally in a single dose
     OR
   - Metronidazole 500 mg orally twice daily X 7 days
   - Not recommended *:Metronidazole gel (efficacy < 50%)*
   - Treat partner and screen for other STIs as appropriate.
2. **Pregnancy**
   - Metronidazole category B- treat as in non pregnant
   - Tinidazole category C
3. **Lactation**
   - Metronidazole-withhold lactation for treatment period and 12-24 hours after last dose
   - Tinidazole- withhold lactation for treatment period and 3 days after last dose
4. **Follow-Up**
   - Only if treatment failed
   - Consider Tinidazole (in non pregnant) if prior treatment with Metronidazole. Susceptibility testing might be needed; Consult specialist or cdc.gov/std

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Patient Education

1. http://familydoctor.org/online/famdocen/home/women/reproductive/vaginal/194.html

References

1. Eckert LO. Acute Vulvovaginitis. *N Engl J Med* 2006; 355:1244-1252.
2. Anderson MR, Klink K, Cohrssen A. Evaluation of Vaginal Complaints. *JAMA* 2004; 291(11): 1368-1379.
3. Centers for Disease Control and Prevention. Sexually Transmitted Diseases Treatment Guidelines 2010. *MMWR* 2010; 59(RR-12): 1-110.

4. Stricker T, Navratil F, Sennhauser FH. Vulvovaginitis in Prepubertal Girls. *Arch Dis Child* 2003; 88:324-326.
5. Nyirjesy P et al. Causes of Chronic Vaginitis: Analysis of a prospective database of affected women. *Obstetrics & Gynecology* 2006; 108(5): 1185-7
6. Sobel JD. Vaginitis. *N Engl J Med* 1997; 337:1896-1903.
7. Nachtigall LE. Comparative study: Replens versus local estrogen in menopausal women. *Fertil Steril* 1994; 61(1): 178-80.
8. McDonald HM, Brocklehurst P, Gordon A. Antibiotics for treating bacterial vaginitis in pregnancy. *Cochrane Database Syst Rev* 2009; issue 4.
9. Suckling J, Kennedy R, Lethaby A, Roberts H. Local Oestrogen for vaginal atrophy in postmenopausal women. *Cochrane Database Syst Rev* 2006; issue 4.
10. Nguyen P, Fu R, Freeman M, Bougatsos C, Guise JM. Screening and Treatment for Bacterial Vaginosis in Pregnancy: Systematic Review to Update the 2001 U.S. Preventive Services Task Force Recommendation (Internet). *AHRQ* 2008 Jan. Report No: 08-05106-EF-1
11. Sobel JD et al. Suppressive antibacterial therapy with 0.75% metronidazole vaginal gel to prevent recurrent bacterial vaginosis. *Am J Obstet Gynecol* 2006; 194(5): 1283-9.
12. Murphy R. Desquamative inflammatory vaginitis: what is it? *Dermatol Ther* 2004; 17(1): 47-9.
13. Nachtigall LE. Comparative Study: Replens versus local estrogen in menopausal women. *Fertil Steril* 1994; 61(1): 178-80.

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