Vaginitis

Is the wet prep out of the building?

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<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>30%</td>
</tr>
<tr>
<td>Bacterial vaginosis</td>
<td>23-50%</td>
</tr>
<tr>
<td>Candida vaginitis</td>
<td>20-25%</td>
</tr>
<tr>
<td>Mixed</td>
<td>20%</td>
</tr>
<tr>
<td>Desquamative inflammatory vaginitis</td>
<td>8%</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>5-15%</td>
</tr>
</tbody>
</table>
Is vaginal discharge ever “normal”?

- Few primary studies and most of low quality.
- Quantity and quality of vaginal discharge varies considerably across women and during the menstrual cycle.
- Symptom of vaginal discharge is non-specific.
- Vaginal discharge is often thought to be vaginitis.
Vaginal symptoms are very common

- Presence or absence of a microbe corresponds poorly with the presence or absence of symptoms.
- No agreement about timing, color or characteristics of discharge among women with vaginal discharge
- Most women think vagina should be “dry”.
- *Vaginal wetness may be normal.*

Patient with chronic vaginal discharge

- 17 year old GO complains of lots of heavy white vaginal discharge which is bothersome.
- Regular periods, denies any sexual activity.
- Numerous evaluations for STI’s, all negative.
- Treated for vaginal candida, BV and trich although there was no evidence for any infection and did not resolve discharge.
Physiologic vaginal discharge

- Patients and providers may consider that a thick white discharge is most frequently caused by candidiasis.
- May lead to repeated use of unnecessary antifungal therapy and prompt concerns of recurrent infection if not resolved.
17 year old

Chronic vaginal discharge

Always wears a pad

Diagnosis?

Vaginitis?

Apgar, Brotzman, Spitzer
Accurate diagnosis of vaginal complaints

- Traditionally considered “simple”.
  - Thus, commonly managed by phone.
  - Patients often insist on this approach and decline office visit for a variety of reasons.
- Diagnosis by phone is only marginally better than random chance.
Accuracy of telephone triage

- 26% who called to get refills were treated for similar symptoms in the previous 4 months **without** exam.
- No specific symptoms allow triage personnel (by phone) or clinicians (by visual inspection) to correctly diagnose vaginitis with high degree of certainty.
  - Kappa = poor agreement < 0.40
- *Telephone triage should be discouraged.*

Frustrated New Patient

- 32 year old G2P2 presents with “lots of yeast infections” since delivery of her 2nd child 2 years ago.
- Self medicates with OTC yeast remedies every 1-2 months with inconsistent relief of symptoms.
- If no relief, calls PCP’s office and typically an azole is prescribed without an office visit.

- She is frustrated and wonders if her husband should be treated.
Women with chronic vaginitis

- May specify how disruptive the problems are and how frustrated the refractory symptoms are to quality of life.

- Often will self-medicate with a variety of OTC products and alternative meds to reduce symptoms.

*Self-treatment may make the symptoms worse. Acting as their own provider.*
Most common diagnoses in 200 patients with chronic vaginitis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>n=200 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact dermatitis</td>
<td>42 (21)</td>
</tr>
<tr>
<td>Recurrent vulvovaginal candidiasis</td>
<td>41 (20.5)</td>
</tr>
<tr>
<td>Atrophic vaginitis</td>
<td>29 (14.5)</td>
</tr>
<tr>
<td>Vulvar vestibulitis syndrome</td>
<td>25 (12.5)</td>
</tr>
<tr>
<td>Lichen simplex or sclerosus</td>
<td>22 (11)</td>
</tr>
<tr>
<td>Physiologic leukorrhea</td>
<td>18 (9)</td>
</tr>
<tr>
<td>Desquamative inflammatory vaginitis</td>
<td>16 (8)</td>
</tr>
<tr>
<td>Bacterial vaginosis</td>
<td>13 (6.5)</td>
</tr>
</tbody>
</table>

Alternative therapies used by women with chronic vaginitis

<table>
<thead>
<tr>
<th>Therapy</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yogurt</td>
<td>226 (46.9)</td>
</tr>
<tr>
<td>Acidophilus pills</td>
<td>162 (34.7)</td>
</tr>
<tr>
<td>Other health-food supplements</td>
<td>69 (14.4)</td>
</tr>
<tr>
<td>Low-carbohydrate diet</td>
<td>63 (13.1)</td>
</tr>
<tr>
<td>Garlic or garlic supplements</td>
<td>41 (8.5)</td>
</tr>
<tr>
<td>Low-oxalate diet</td>
<td>27 (5.6)</td>
</tr>
<tr>
<td>Acupuncture</td>
<td>22 (4.6)</td>
</tr>
<tr>
<td>Glucosamine tablets</td>
<td>17 (3.5)</td>
</tr>
</tbody>
</table>

Self-Treatment of vulvovaginal candidiasis

- Only 33% who purchased an OTC product for treatment actually had VVC.
  - 20% had VVC plus another type of vaginitis (mixed infection).
- Over- and under-diagnosis.
  - Current clinical approaches too often based on trial and error.
- 51% of these women need a clinician-prescribed agent for adequate therapy.

Sobel JD. Am J OG 2015.06.067
Diagnosis for women intending to treat “yeast infection” with OTC product

<table>
<thead>
<tr>
<th>Final diagnosis</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>13.7</td>
</tr>
<tr>
<td>Candidiasis</td>
<td>33.7</td>
</tr>
<tr>
<td>Trichomononas</td>
<td>2.1</td>
</tr>
<tr>
<td>BV</td>
<td>18.9</td>
</tr>
<tr>
<td>Other (atrophy, irritant dermatitis etc)</td>
<td>10.5</td>
</tr>
<tr>
<td>BV + Candida</td>
<td>18.9</td>
</tr>
<tr>
<td>BV + Trichomononas</td>
<td>1.1</td>
</tr>
<tr>
<td>Trichomononas + Candida</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Candida glabrata and BV

- Link between C. glabrata and BV.
  - More tolerant of alkaline pH than C. albicans.
  - Can survive high pH typical of BV.
- “Mixed” infection – can be confusing!
Candida glabrata and clue cells

Sobel J. NEJM 1997;337.
Clinical diagnosis vs. DNA probe  n-535

<table>
<thead>
<tr>
<th>Clinical Diagnosis</th>
<th>Negative</th>
<th>TV Only</th>
<th>BV Only</th>
<th>CV Only</th>
<th>BV/TV Mixed</th>
<th>BV/CV Mixed</th>
<th>BV/TV/CV Mixed</th>
<th>Row Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal or other clinical diagnosis*</td>
<td>64</td>
<td>0</td>
<td>21</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>92 (17.2)</td>
</tr>
<tr>
<td>TV only</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>1</td>
<td>12 (2.2)</td>
</tr>
<tr>
<td>BV only</td>
<td>46</td>
<td>0</td>
<td>174</td>
<td>5</td>
<td>1</td>
<td>9</td>
<td>1</td>
<td>236 (44.1)</td>
</tr>
<tr>
<td>CV only</td>
<td>25</td>
<td>1</td>
<td>9</td>
<td>58</td>
<td>0</td>
<td>18</td>
<td>1</td>
<td>112 (20.9)</td>
</tr>
<tr>
<td>BV/TV</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>12 (2.2)</td>
</tr>
<tr>
<td>BV/CV</td>
<td>4</td>
<td>0</td>
<td>20</td>
<td>9</td>
<td>0</td>
<td>38</td>
<td>0</td>
<td>71 (13.2)</td>
</tr>
<tr>
<td>BV/TV/CV</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Column total</td>
<td>139 (26.0)</td>
<td>8 (1.5)</td>
<td>225 (42.1)</td>
<td>76 (14.2)</td>
<td>15 (2.8)</td>
<td>69 (12.9)</td>
<td>3 (0.6)</td>
<td>535</td>
</tr>
<tr>
<td>Accuracy (%)</td>
<td>46.0</td>
<td>50.0</td>
<td>77.3</td>
<td>76.3</td>
<td>46.7</td>
<td>55.1</td>
<td>0</td>
<td>64.5</td>
</tr>
</tbody>
</table>

TV, trichomoniasis vaginalis; BV, bacterial vaginosis; CV, candida vaginitis.
Data are n (%) unless otherwise specified.
*This category also includes miscellaneous noninfectious clinical diagnoses such as contact dermatitis, herpes genitalis, condylomata, presumptive chlamydia or gonorrhea, traumatic injury, etc.

Clinical dx = Hx, pelvic exam, wet prep, pH, amines

Lowe NK et al. Obstet Gynecol 2009;113:89-95
“Mixed” vaginitis
This smartphone is neither a diagnostic nor therapeutic tool

“Hi Ms. Smith – Sounds like you have a yeast infection so will send a prescription to your pharmacy”
Negative wet prep does not rule out vaginitis

- Sensitivity of microscopy is approximately 50% compared with NAAT (trich) or culture (Candida).
- Objective signs of vulvar inflammation without vaginal pathogens after lab testing suggests other causes:
  - Mechanical
  - Chemical
  - Allergic
  - Other non-infectious causes
Vaginal and vulvar complaints may complicate management

- Women with vulvar conditions can have vaginal processes such as candidiasis or atrophic vaginitis.
- 71 yo with 10 years of daily vulva itching.
- Severe vaginal dryness and dyspareunia.
- No relief from OTC’s.
Atrophy in 60 year old
## Testing for causes of vaginal complaints

<table>
<thead>
<tr>
<th>Condition</th>
<th>Vaginal pH</th>
<th>Saline or 10% Potassium Hydroxide Microscopy</th>
<th>Amines</th>
<th>Current Gold Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;4.7</td>
<td>Unremarkable, ± white blood cells, bacillary flora</td>
<td>Negative</td>
<td>Clinical diagnosis</td>
</tr>
<tr>
<td>Vulvovaginal candidiasis</td>
<td>&lt;4.7</td>
<td>Hyphae, blastospores</td>
<td>Negative</td>
<td>Yeast culture with speciation</td>
</tr>
<tr>
<td>Bacterial vaginosis</td>
<td>≥4.7</td>
<td>Clue cells, coccobacillary flora</td>
<td>Positive</td>
<td>Gram stain (Nugent score)</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>Varies</td>
<td>Trichomonads</td>
<td>Variable</td>
<td>Trichomonas vaginalis PCR</td>
</tr>
<tr>
<td>Atrophic vaginitis</td>
<td>≥4.7</td>
<td>Parabasal cells, decreased mixed flora</td>
<td>Negative</td>
<td>Maturation index</td>
</tr>
<tr>
<td>Desquamative inflammatory vaginitis</td>
<td>≥4.7</td>
<td>Parabasal cells, increased white blood cells, mixed flora</td>
<td>Negative</td>
<td>Clinical diagnosis</td>
</tr>
</tbody>
</table>

Trichomoniasis diagnosis

Wet mount 54% sensitive for trich

Vulvovaginal candidiasis (VVC) diagnosis

- Wet prep.
  - Detects buds/hyphae in 30-50%.
  - 10% KOH (Sensitivity 70%).
- 33% with symptomatic VVC have negative KOH.
- *Culture for yeast species (gold standard).*
  - Consider if normal pH and negative wet prep + symptomatic.
- PCR.

What’s the problem with culture?

- Identifying Candida on culture in asymptomatic woman is **not** an indication for treatment.

- Why?
  - 10-20% of women harbor Candida species and other yeasts in the vagina.
  - *No need for treatment if asymptomatic.*
<table>
<thead>
<tr>
<th>Gram Stain</th>
<th>Gram stain is consistent with normal vaginal flora. No clue cells are present.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urogenital Culture/Smear</td>
<td>No beta Streptococcus or yeast isolated.</td>
</tr>
<tr>
<td>Resulting Agency</td>
<td>MM PATH</td>
</tr>
</tbody>
</table>
Gram Stain (Abnormal)
  Gram stain is indeterminant for bacterial vaginosis.
  Few budding yeast
  Few pseudohyphae

Urogenital Culture/Smear (Abnormal)
  Candida albicans
  Comment:
    Moderate

Urogenital Culture/Smear (Abnormal)
  Streptococcus Group B
  Comment:
    Rare quantity of
Yeast Culture (Abnormal)

Candida albicans

Comment:
Moderate

Susceptibility for research use only
Performance characteristics of this
Microbiology/Virology Laboratory. This
certified laboratory and does not re-

Susceptibility

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anidulafungin</td>
<td>mcg/mL</td>
<td>&lt;=0.03 S</td>
</tr>
<tr>
<td>Caspofungin</td>
<td>mcg/mL</td>
<td>&lt;=0.25 S</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>mcg/mL</td>
<td>&lt;=0.06 mcg/mL</td>
</tr>
<tr>
<td>Itraconazole</td>
<td>&lt;=0.008 mcg/mL</td>
<td></td>
</tr>
<tr>
<td>Micafungin</td>
<td>mcg/mL</td>
<td>&lt;=0.008 S</td>
</tr>
<tr>
<td>Posaconazole</td>
<td>0.06 mcg/mL</td>
<td>&lt;=0.008 S</td>
</tr>
<tr>
<td>Voriconazole</td>
<td>mcg/mL</td>
<td>&lt;=0.008 S</td>
</tr>
</tbody>
</table>

Susceptibility Comments

Candida albicans
Gram Stain (Abnormal)

Gram stain is consistent with normal vaginal flora. No clue cells are present.
Moderate yeast

Moderate polymorphonuclear leucocytes ****

Comment:
No Beta Streptococcus isolated.

Urogenital Culture/Smear (Abnormal)

Yeast

Comment:
Numerous

What is the diagnosis?
What would you do?

SOURCE: Vagina

RESULTS

Gram Stain

FINAL 08/26/15 00:38

Gram stain is consistent with bacterial vaginosis.
Moderate clue cells

Urogenital Culture

FINAL 08/28/15 17:17

No beta Streptococcus or yeast isolated.
Diagnosis:
Negative for intraepithelial lesion or malignancy.
Predominance of coccobacilli suggestive of bacterial vaginosis.

Adequacy:
Satisfactory for evaluation. Transformation zone present.

What would you do?
Bacterial Vaginosis
Amsel criteria (3 out of 4 must be present)

1. Homogenous grayish-white discharge.
2. Vaginal pH > 4.5 (greatest sensitivity but lowest specificity)
   - need narrow-range pH paper.
3. Clue cells (> 20-40% on HPF microscopy).
   - most specific sign of BV.
4. A positive “amine test”.
   - Not Amsel- decreased number of lactobacilli.
Summary of Vaginitis

- Think mixed infections.
- Think new diagnostic tools (not the phone!)
- Think atrophic vaginitis.
- Think vaginitis and vulvar skin condition.
The End ........ thanks!