



Microbiology Practical

Sexually Transmitted Diseases



Microbiology Team 430

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STDs		
Bacterial	Viral	Parasite
Syphilis	AIDS	Trichomonas vaginalis
Gonorrhoea	Genital Herpes	
Chlamydia	Genital Warts	

Case 1: Syphilis

Scenario:

A 23-year-old alcoholic and drugs (cocaine) addict single male arrived from his trip to South East Asia four months ago. He gave history of multiple sexual partners. Two months ago, he developed **ulcer on his penis** which disappeared completely. A full physical notes a **rash on both his palms and his soles**.

Etiology:

Treponema pallidum

Causes of ulcers (Differential diagnosis):

Ulcer	Etiology	Ulcer	Lymphadenopathy (Bubo)
Chancroid	<i>Haemophilus Ducreyi</i> (Gm-ve bacilli)	Wet, painful, with irregular border (soft ulcer).	Inguinal tender
Chancre	<i>Treponema Pallidum</i>	Dry, painless and raised margin (hard ulcer)	Inguinal
Ulcerated Vesicles	<i>Herpes Simplex Virus 2</i>	Multiple, shallow, painful	Occasionally present

Clinical picture:

Primary: **Chancre** (painless, dry ulcer) and **inguinal lymphadenopathy**.

Secondary: mucocutaneous **rash (in palms and soles)**, mouth lesions (*snail track ulcers*) and Bactremia.

Latent stage: with **no manifestation** and **+ve serology test**.

Tertiary: **Neuro syphilis** and **cardiovascular syphilis**.

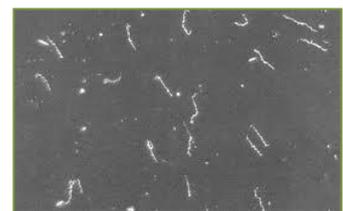
So according to the scenario the diagnosis is: **secondary syphilis**

Investigations:

- **Dark field microscopy** → shows **thin spiral bacteria** (*T.Pallidum*)

- **Serology:**

- **Specific (treponemal):** if infected, always + → **confirmatory test**.
- **Non-specific (VDLR and RPR):** if infected +, and decrease after treatment → **so it's used for diagnosis and follow up**



Ulcer	Microscopy	Culture	DFA	Serology
<i>Haemophilus Ducreyi</i>	Gram stain; gm-ve small bacilli	Selective media	Not used	Not used
<i>Treponema Pallidum</i>	Dark Field M; Motile Spirochetes	Not grown (can't be cultured or stained)	+	As mentioned above
<i>Herpes Simplex Virus 2</i>	Electron Microscopy -Not routinely used	Produce cytopathic effect in cell culture	+	IgM → acute infection. IgG → previous exposure

Management:

- 1) **Penicillin** (single does IM).
- 2) Investigation of other STDs (because co infections are common).
- 3) Test the partner.
- 4) Counseling & educations for both.

HSV infection:

Acyclovir

Haemophilus Ducreyi:

Doxycycline,

Erythromycin

Case 2: Gonorrhea (Gonococcal Urethritis)

○ Scenario :

A 35-year-old Pilipino married male presented to the emergency room complaining of **dysuria for the last 24-hour (acute)** and noted some "**pus-like**" drainage in his underwear and the tip of his penis.

○ Etiology:

Neisseria gonorrhoeae

Causes of discharge and urethritis (Differential diagnosis):

	Organisms	Urethritis
Gonococcal Urethritis (GCU)	<i>Neisseria gonorrhoeae</i>	Purulent discharge
Non-gonococcal urethritis (NGDU)	<i>Chlamydia trachomatis</i>	Mucopurulent

○ Clinical picture:

Acute pus like discharge (purulent) and acute urethritis

In women it may appear asymptomatic → in labor transmitted to baby → newborn with conjunctivitis (treated immediately with silver nitrate)

Chlamydia clinical presentation is:

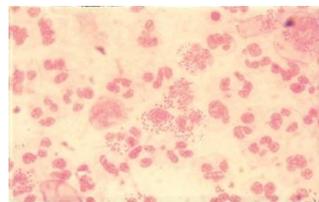
Vaginal itching

Mucopurulent discharge

Do not resolve after treatment with ceftriaxone

○ Investigations:

- **Culture on blood agar** or "Thayer-Martin media";
Show **Gm-ve intracellular diplococci** with **pus cells**



	Organisms	Smear/Culture	Molecular testing
GCU	<i>Neisseria gonorrhoeae</i>	Gram-ve diplococci & pus cell Grow on selective media (blood agar)	+ve (Gold Standard)
NGCU	<i>Chlamydia trachomatis</i>	Pus cell without organism (doesn't grow in artificial media) only grows on <u>McCoy</u> <u>Cell culture</u> show inclusion bodies	+ve (Gold Standard)

○ Management:

- 1) Single injection of **Ceftriaxone**
- 2) Screening for other STDs (mainly Chlamydia).
- 3) Test the partner's.
- 4) Counseling & educations for both.

Chlamydia management is:

Macrolides: **Azithromycin**

Tetracyclines: **Doxycyclin**

Case 3: Trichomoniasis

○ Scenario:

A 24-year-old female noted **vaginal itching and irritation with a discharge**. Previously, she developed a yeast infection that was treated with over-the-counter medications and resolved. Thinking that this was recurrence, she again self-treated. This time, however, the symptoms did not resolve.

She presented to her family physician for management. On examination there is a **bad odor along with a frothy discharge and strawberry cervix**.

Swab of the secretions was taken in order to perform tests.

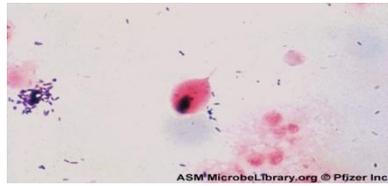
When wet prep/ Gram stain is done:

Wet mount of the swab demonstrates "swimming" **Motile Trophozoites**



"Strawberry cervix"

- **Etiology:**
Trichomonas vaginalis



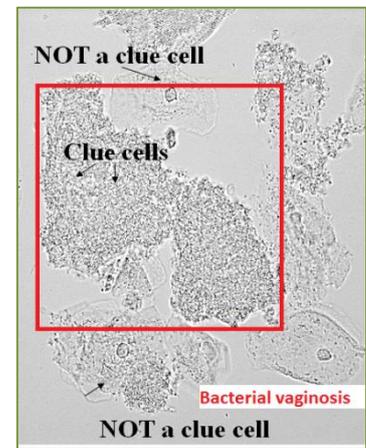
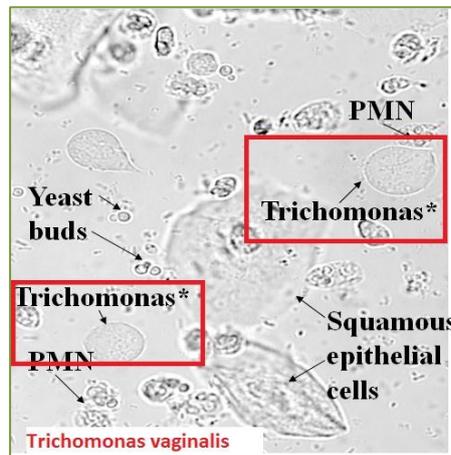
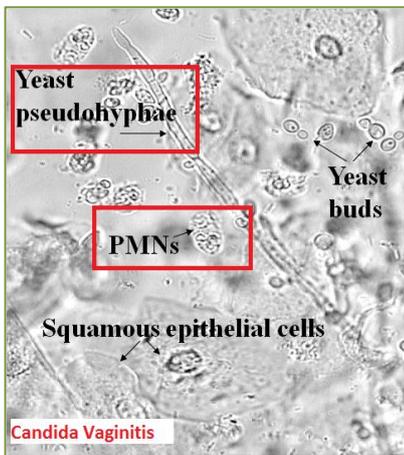
Causes of vaginal discharge (Differential diagnosis):

Organism	Vaginal discharge
<i>Bacterial vaginosis</i>	Thin, milky-white or gray vaginal discharge with Fishy-smelling
<i>Candida vaginitis</i>	Thick, curdy, white (like cottage cheese) vaginal discharge
<i>Trichomonas vaginalis</i>	Yellow-green to gray sometimes frothy and malodorous smelling

- **Clinical picture:**
Vaginal discharge: a yellow-green to gray sometimes frothy and malodorous smelling, Pruritis in females, Painful urination, Painful sexual intercourse but may be asymptomatic.

- **Investigations:**
Wet Prep, wiff test, PH and Culture

	PH	Whiff test/ KOH	Gram stain/ Wet prep	Culture	Immunologic/ molecular test
<i>Bacterial vaginosis</i>	>4.5	+++ (fishy smell)	Clue cells		DNA Probe (gardnerella vaginalis)
<i>Candida vaginitis</i>	<4.5	-	Yeast and pseudohyphae	Candida	DNA Probe
<i>Trichomonas vaginalis</i>	>4.5	+ (malodour)	Trichomonas	Motile Trophozoites	EIA DNA Probe



PMNs: A neutrophil; a white blood cell with

- **Management:**
 - 1) Metronidazole.
 - 2) Screening for other STDs (mainly Chlamydia).
 - 3) Test the partners.
 - 4) Counseling & educations for both.

Management:
Bacteria vaginosis: Metronidazole
Candidiasis: Fluconazole

What organisms would you screen for in any patient present with any STD?
HIV → IMP Chlamydia
Gonorrhea syphilis → IMP

Virology (Diagnosis)

We screen 3 viruses in pregnant women: HIV, Hep B and Rubella

<u>HIV diagnosis:</u>	<u>Genital herpes diagnosis:</u>	<u>Genital Warts Diagnosis:</u>
<ul style="list-style-type: none">- ELISA (1st test for screening, if + we do other confirmatory tests): serum sample- PCR- Western blot- RIBA	<ul style="list-style-type: none">- Tissue culture: (Vesicle fluid sample): We look for CPE.- Direct IF: (Vesicle fluid sample): We detect Ag.- ELISA: (Sample is serum): We detect Ab (IgM).- PCR: (Sample is CSF “): we do it in case of neonatal herpes.	<ul style="list-style-type: none">- Medical examination in External warts.- Colposcopy in Internal warts.- PCR: detect HPV DNA.- In-situ DNA hybridization: HPV genotype.- Pap smear: identify <u>abnormal epithelial</u> cells of the cervix (cervical dysplasia).

Remember in each STD:

- Etiological agent
- Clinical presentation
- Microbiological diagnosis
- Management outlines

Good Luck 😊