STDs and the EYE

Susan Kovacich, OD, FAAO
Cornea and Contact Lens Clinic
Indiana University School of Optometry

Disclosure Statement
• Paid speaker for Alcon

The List
• Chlamydia
• Genital Herpes
• Pthirus pubis
• Syphilis
• Gonorrhea
• HIV/AIDS

CO-INFECTIONS

STDS and the EYE
• Ocular findings may be the first sign of sexually transmitted diseases
• Take a more thorough systemic history when suspect STD
• Refer to R/O systemic disease (Co-Manage)

Modes of Transmission

Direct Contact
Sexual contact
(vaginal, oral, anal)
Exposure to organism/bodily fluids

Autoinoculation
Exposure to organism/bodily fluids
(“Which hand do you use?”)
Modes of Transmission

Mother to child
• Exposure to organism in womb or during birth (vertical transmission)
• Breastmilk

Case #1
• 22 YO Male
• International student (language barrier)
• C/O red, watery OS, for several days, more uncomfortable with contact lens
• Unknown brand of contact lenses/generic sol
• Sleeps in lenses 2-3 nights/week
• Does not report history of illness or exposure to red eye

Case #1
• VAs with SpRx
  OD 20/20-
  OS 20/30-
• SLE
  Lids and Lashes: Some palpebral injection
  Conj: +2-3 injection OU
  Cornea: +2-3 staining infiltrates OU
  A/C: clear OU
  Lens: clear OU
• -PAD

Case #1
• Assessment: CLARE OS
• Plan: Zylet (Tobradex) qid OS X 7 days, RTC if condition worsens
• DDx-other CL related red eye
  Infiltrative conjunctivitis
  Viral conjunctivitis

Case #1
1 Week Follow-Up Visit
• C/O Not much improvement in comfort or vision OS
• OS still uncomfortable, still watery with reduced vision and wearing time
• Not wearing contact lenses as directed
• VA unchanged
• SLE: more follicles????
• + PAD
Follicular Conjunctivitis

Case #1

- Differential Diagnosis
  - Chlamydia—sex talk (language barrier)
  - Viral
- Sent patient to SHC for R/O chlamydia: conjunctival scraping, urine sample and possible treatment
- Patient tested positive for Chlamydia conjunctivitis and urethritis
- Pt put on Azythromycin (Z pack)

Chlamydia in the Eye (Adult Inclusion Conjunctivitis or AIC): Symptoms

- Red eye (injection)
- Stringy discharge
- SPK
- Superior corneal pannus
- Peripheral infiltrates
- Iritis
- Follicles* (especially in lower cul de sac)
+ PAD

Injection

Discharge

Limbal follicles
Hallmarks of Adult Inclusion Conjunctivitis (AIC)

- Follicular conjunctivitis in lower cul-de-sac*
- Non-resolving red eye after standard topical treatment with antibiotics*
- Often unilateral but can progress to bilateral
- Transmission to eye: Autoinoculation or direct contact with infected bodily fluids
- Will resolve without treatment in 6-18 months

Chlamydia

- Most commonly reported bacterial sexually transmitted infection in the US
- 2012: 1,422,976 cases reported (.7% increase over 2011)
- Estimated: 2.86 million/yr (US) infections/annually (many cases asymptomatic)
- Young people (1 in 15 sexually active females aged 14-19 YO are infected)

Chlamydia transmission

- Sex: vaginal/oral/anal
- Autoinoculation to eye
- To baby during childbirth from infected cervix causing neonatal inclusion conjunctivitis (most common cause of opthalmia neonatorum) or pneumonia
### Chlamydia- Systemic Involvement

<table>
<thead>
<tr>
<th>Male and Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urethritis</td>
<td>Prostatitis</td>
<td>Cervicitis</td>
</tr>
<tr>
<td>Proctitis</td>
<td>Epididymis</td>
<td>Pelvic Inflammatory Disease (PID)* (lead to infertility)</td>
</tr>
<tr>
<td>Infertility (rare in males)</td>
<td>Eclectic</td>
<td>Pregnancy* (can cause death)</td>
</tr>
</tbody>
</table>

*CDC estimates 24,000 women become infertile each year due to undiagnosed STIs

### Chlamydia- Systemic Symptoms

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penile discharge</td>
<td>Abnormal vaginal discharge</td>
</tr>
<tr>
<td>Burning sensation during urination</td>
<td>Burning sensation during urination</td>
</tr>
<tr>
<td>Testicular swelling or pain (epididymitis)</td>
<td>Rectal/pelvic pain</td>
</tr>
<tr>
<td>Rectal pain, discharge and/or bleeding (proctitis)</td>
<td>Rectal/pelvic pain and/or bleeding (proctitis)</td>
</tr>
</tbody>
</table>

### Diagnosis

- Urine sample (men)
- Vaginal swab
- Eye-Conjunctival scraping-low yield typical

- Gram Stain/immunofluorescence (anti-chlamydial antigen monoclonal antibody)
- Polymerase chain reaction (PCR) test

### Chlamydia Treatment

- Azythromycin single 1 gm dose
- Zithromax Z pack
- Doxycycline 100 mg/bid X 1-2 weeks
- Oral erythromycin 250 or 500 mg qid x 1 week pregnant and lactating women

- Oral medications manage conjunctivitis- can use erythromycin ung: follicles take weeks to resolve
- Partners also need to be treated
- Prevention- condoms

### Case #2

**“Joey”**

- 21 YOWM
- Red, watery right eye, 2 day duration, slight FBS
- Decreased vision OD
- Can’t wear contact lens in that eye
Case #2
"Joey"

- Vision with spectacles
  OD 20/30
  OS 20/20
- SLE
  L+L: WNL
Conj: + 1 injection OD/Clear OS
Cornea: small (2-3 mm) dendrite through
visual axis OD/Clear OS

Diagnosis

- Herpes Simplex Keratitis
- Differential Diagnosis- none

More in depth history

- “Do you have an infection any where else on
  your body?”
- “Yes, 5-6 sores on the shaft of my penis.”

Referral

- Pt referred to the SHS to R/O genital herpes
- Pt reported an extensive sexual history
- Pt tested positive for genital herpes (HSV-2)
  and was put on Valtrex (Valacyclovir) 1 gm PO
  bid for 10 days

Ocular Treatment

- Patient was put on Zirgan (ganciclovir 0.15%
gel) 5 X day OD
- 2 day F/U dendrite was 50% resolved
- 4 day F/U dendrite was gone, Zirgan was
  reduced to tid OD X 1 week
- Zirgan (gan: Prodrug activated by thymidine
  kinase (viral enzyme) to inhibit synthesis of
  viral DNA
Herpetic Eye Disease

- Recurrent corneal involvement can result in scarring and an irregular corneal surface (resulting in irregular astigmatism), both of which can reduce vision
- Scarring secondary to herpetic corneal disease is one of the leading causes of decreased vision in the developed world
- Ocular involvement tends to be unilateral

Eyelid/Skin Involvement

- Broad spectrum antibiotic such as erythromycin or bacitracin ophthalmic ung
- Lid lesions are typically managed with cool compresses p.r.n.
- Oral antivirals such as generic Acyclovir, 800 mg t.i.d. P.O. for 7-10 days is the standard treatment in adults, especially in suspected primary herpetic disease
- Expensive topical antiviral ointments do not have much of an effect on these lesions

Conjunctivitis

- Cool compresses and artificial tears are commonly employed palliative treatment
- Topical antivirals typically are not indicated in the absence of other ocular findings
- Oral antivirals may be employed in severe cases, with the same dosing as eyelid disease

Corneal Epithelial Disease

- Ganciclovir 0.15% gel (Zirgan) 5X/day until re-epithelialization, then tapered to t.i.d. for 1 week. The cheaper generic oral
- Acyclovir has been used to manage dendrites, especially in cases where the patient could not afford the topical medication (dosing 800 mg b.i.d. X 7-10 days), and has also been used in cases where compliance can be a problem, as with children.
- Cycloplegia if needed

Earliest Sign
Punctate Keratitis-Microdendrite

Limbal/Marginal Dendrite
The incidence of Herpetic Eye Disease
- 8 new cases/100,000 people/year
- 21 total, new and recurrent, /100,000 people/year.
- The incidence of all herpetic disease is 300/100,000.
- In the US, 50,000 new or recurrent cases of ocular disease occur each year, and 400,000 Americans total are affected by the disease.

Ocular Herpes Systemic Management
HEDS II
Acyclovir Prevention Trial (HEDS-APT)
- 400 mg of oral Acyclovir b.i.d. for 1 year resulted in a 45% decrease in the rate of recurrence for all forms of ocular complications
- 50% reduction in stromal keratitis
(Some new studies report resistance to acyclovir in immunocompromised patients)

Vessicles

Herpes Simplex Virus Type 1 (HSV-1)
- DNA virus
- Oro-labial or cutaneous (oral-facial-ocular)
- Acquired during childhood
- Latent in trigeminal ganglia
- Genital recurrence infrequent (if any genital involvement)

Herpes Simplex Virus Type 2 (HSV-2)
- DNA virus
- Genital
- Acquired sexually
- Latent in sacral sensory ganglia
- Genital recurrence common
- Common triggers:
- Common locations: Shaft of penis, labia, buttocks

Herpes Simplex Virus Type 1 (HSV-1)
- Common triggers: Reactivation of virus from triggers such as fatigue, emotional stress, menses, sunlight (UV exposure), fever and other stressors to immune system such as Excimer laser treatment and prostaglandin eye drops
- Common location: vermilion border of lip (“cold sore” or “fever blister”)
Genital Herpes
Herpes Simplex Virus Type 2 (HSV-2)

- US estimate: 776,000 new genital herpes infections/year
- 1/6 Americans aged 14-49 have HSV-2
- More easily transmitted by males to females, therefore more common in females (1/5) compared to males (1/9) in 14-49 age range

cdc.gov

Genital Herpes Symptoms

- Often asymptomatic or mild symptoms that go unnoticed
- First event may experience flu-like symptoms (fever, aching, swollen glands)
- Blisters (vesicles) around genitals, rectum or mouth
- Vesicles open and cause painful sores that heal after 2-4 weeks
- Repeat events- “outbreaks”

cdc.gov

Genital Herpes Transmission

- Sexual- vaginal/anal/oral
- Skin to skin transmission (can contract despite condom use)
- Can contract from asymptomatic individual
- Autoinoculation to eye
- Pregnant woman to child (Caesarian may be necessary during active outbreak)

cdc.gov

Genital Herpes Management

- Not curable, lifelong infection
- Treat primary infection
- Acyclovir
- Valtrex
- Famvir
- Manage repeat infections

cdc.gov

Initial antiviral treatment for genital herpes (CDC recommendations)

- Acyclovir 400 mg orally three times a day for 7-10 days
  - Or
- Acyclovir 200 mg orally five times a day for 7-10 days
  - Or
- Famciclovir 250 mg orally three times a day for 7-10 days
  - Or
- Valacyclovir 1 gm orally twice a day for 7-10 days
  - Or
- *Treatment can be extended if healing is incomplete after 10 days of therapy

Suppressive antiviral therapy for recurrent genital herpes (CDC recommendations)

- Acyclovir 400 mg orally twice a day
  - Or
- Famciclovir 250 mg orally twice a day
  - Or
- Valacyclovir 500 mg orally once a day*
  - Or
- Valacyclovir 1 g orally once a day
  - Or
- *Valacyclovir 500 mg once a day might be less effective than other valcyclovir or acyclovir dosing regimens in patients who have very frequent recurrences (i.e. ≥ 10 episodes per year)
Episodic antiviral therapy for recurrent genital herpes (CDC recommendations)

- Acyclovir 400 mg orally three times a day for 5 days
- Or
- Acyclovir 800 mg orally twice a day for 5 days
- Or
- Acyclovir 800 mg orally three times a day for 2 days
- Or
- Famciclovir 125 mg orally twice a day 1 day
- Or
- Famciclovir 500 mg once, followed by 250 mg twice daily for 2 days
- Or
- Valacyclovir 500 mg orally twice a day for 3 days
- Or
- Valacyclovir 1 g orally once a day for 5 days

Case 3

- 19 YOF
- C/O Routine eye exam, but some eye itching lately
- VA with spectacles
  OD 20/20
  OS 20/20
- SLE:
  Lids and Lashes: Several nits on upper and lower lashes

Further questioning

- Pt admitted that she also was experiencing itching in the pubic area
- She had not observed any actual lice
- Referred to Adult Medicine for Dx/Tx
- Patient was diagnosed with pubic lice, treated with OTC preparation, partners notified (?)

LICE

- Parasitic insects found on the human head, and body, feed on blood, and spread by crawling (person to person contact or fomites such as clothes and bedding). Three types of lice that live on humans are:
  - Pediculus humanus capitis (head louse)
  - Pediculus humanus corporis (body louse)-can spread disease
  - Pthirus pubis ("crab" louse, pubic louse)

Pthirus pubis (crab shaped body)

- 1.1-1.8 mm in length as adults
- Found on areas of widely spaced or coarse hair (pubic area, eyebrows, eyelashes, beard, mustache, chest, armpits.)
Symptoms

Systemic
• Itching of affected area(s)
• Intense itching can result in open sores and secondary bacterial infections
• People infected with pubic lice should be tested for other STDs

Ocular
• Itching
• Redness at eyelid margin
• Conjunctivitis

Signs
• Lice observed attached to hair or crawling
• Nits (eggs) attached to hair
• Pubic lice on a child may be a sign of sexual abuse

Ocular treatment
If only a few lice and nits are present, it may be possible to remove these with tweezers/forceps

Application of ophthalmic ointment (not Vaseline) to the eyelid margins 2-4 times a day for 10 days is effective to smother the lice

Systemic Treatment
• First line treatment:
  An OTC lice-killing lotion such as Rid or Nix
  Remove nits with nit comb
• Make every effort to clean towels, linens, clothes
• Sex partners need to be informed and treated

Case #4
The Happy Veteran
• 65 YOM
• C/O Routine Exam
• “I don’t wear glasses and I don’t want glasses”
• Dist VA (uncorrected)
  OD 20/30
  OS 20/30
• Near VA (uncorrected)
  20/30 OU
Case #4

- Refraction (no improvement seen by pt)
  OD +0.50 20/30
  OS +0.50 20/30
  +1.50 ADD 20/30
- Pupils
  Bilateral miotic pupils unresponsive to light with near reaction (light near dissociation)
  SLE: +1 NS

Syphilis “The Great Imitator/Great Imposter”

- Chronic STD
- Spirochete bacteria: Treponema pallidum
- Multisystem/multi-symptom disorder that mimics signs and symptoms of many diseases

Syphilis 2012 CDC Report

15,667 Primary or Secondary (early) of these early cases (11.1% increase since 2011)
Rate increase among men, particularly MSM
360 cases of Congenital Syphilis in 2011
cdc.gov

Congenital Syphilis

- Ocular-
  - Hutchison’s triad (interstitial keratitis (IK), deafness, malformed teeth)
- Cataracts, Chorioretinitis
- Systemic-
  - Osteochondritis, hepatosplenomegaly, anorexia, seizures, death

Acquired Syphilis

- Stages:
  Primary
  Secondary
  Latent
  Tertiary (Late)
Transmission

- Sexual contact: vaginal/oral/anal
- Person to person contact-direct contact with chancre (condoms don’t help)
- Mother to baby
- Blood transfusions
- Eye: Direct contact or carried to the eye by the blood stream

Syphilis-Acquired Primary (often asymptomatic)

Primary Systemic:
- Painless chancre (usually single, but can be multiple) at site of inoculation (external genitals, vagina, anus, rectum, lips, mouth)
  Usually heal in 2-8 weeks
- Lymphadenopathy

Primary Ocular:
- Chancre of eyelids or conjunctiva
- Conjunctivitis
- Blepharitis
- Alopecia

Syphilis-Acquired Secondary

Secondary Systemic:
- Malaise
- Lymphadenopathy
- Fever
- Joint pain
- Headache
- Loss of appetite
- Maculopapular lesions of palms and soles
- Rashes

Secondary Ocular:
- Episcleritis
- Anterior Uveitis
- Uveitic Glaucoma
- Neuroretinitis
- Chorioretinitis
- Ischemic Retinal Vasculopathy
- Infectious Optic Neuropathy

Secondary Syphilis Manifestations

http://www.webmd.com/sexual-conditions/guide/syphilis

http://www.cmaj.ca/content/176/1/33/F1.large.jpg

Syphilis-Acquired Tertiary (Late)
After a Period of Latency (4 years or more)

Tertiary Systemic:
- Focal endarteritis: Formation of granulomatous lesions (“gummas”) involving CNS and CVS- any organ or system

Tertiary Ocular:
- “Gummas” involving eye and adnexa

Syphilis-Acquired Tertiary
15%

Tertiary Systemic:
- Acute Meningitis
- Cranial neuropathies
- Neurosyphilis (10% untreated will develop)
- Tabes Dorsalis
- Dementia
- Death (from damage to internal organs)

Tertiary Ocular:
- Argyll Robertson Pupil
- Optic Atrophy
Syphilis-Acquired Tertiary Neurosyphilis: Approximately 10% of the Untreated Population

Neurosyphilis Systemic:
- Acute meningitis
- Paresis
- Tabes dorsalis

Neurosyphilis Ocular:
- Optic atrophy
- Pupil abnormalities
  - Argyll Robertson-miotic pupils with light-near dissociation

Syphilis Testing - Serologic

Test antibodies to cardiolipin-cholesterol antibodies (non-specific for Treponema pallidum)
- VDRL-venereal disease research laboratory
- RPR- rapid plasma reagin (indicate current activity)

Test for antibodies specific to Treponema pallidum
- FTA-ABS - fluorescent treponemal antibody absorption
- MHA-TP - microhemagglutination assay
  (Do not indicate current activity)

 Usually do one non-specific and one specific test

Syphilis Treatment

- Systemic IV or IM penicillin
  (If PCN sensitive doxycycline, tetracycline, ceftriaxone, chloramphenicol)
- Neurosyphilis - PCN standard treatment
- If patient is sensitive, must be desensitized

Ocular syphilis:
- Topical, periocular, systemic corticosteroids

Syphilis Take Away Points

- Syphilis is the great mimic, must always be aware of many different presentations
- Anterior uveitis may be only systemic finding

Case # 5 (not my case)

- 18 YO F
- C/O Green discharge from both eyes
- SLE: Discharge! OU

Gonorrhea

- Diplococcal G- bacteria: Neisseria gonorrhea
- Thrives in moist, warm areas such as the reproductive tract, anus, eyes, mouth and throat
- 2012: 334,826 cases (2nd most common STD in US after Chlamydia) 4% increase from 2011

cdc.gov
Gonorrhea-Transmission

- Sex-Vaginal, oral, anal
- Mother to baby
- Eye-autoinoculation or direct contact

cdc.gov

Ophthalmia neonatorum (gonorrheal less than 1%)

- 2% Silver nitrate drops/erythromycin ung at birth
- Within 1 month of delivery
- Swollen lids
- Copious mucopurulent discharge
- Topical erythromycin ointment and IV or IM third-generation cephalosporin

cdc.gov

Ocular Gonorrhea Symptoms

- Hyperacute conjunctivitis with profuse mucopurulent discharge and marked periorbital edema
- Pain
- Severe conjunctival edema and chemosis

http://www.accessmedicine.net/loadBinary.aspx?name=knoo3&filename=knoo3_c009f011t.jpg

Gonococcal Ophthalmia

- Conjunctivitis
- Keratitis
- Ulceration
- Descemetocoele formation
- Perforation

http://www.bing.com/images/search?q=Gonorrhea+In+The+Eye&Form=IQFRDR#view=detail&id=9DDBCC4633880103EBE0EAA52FE5CC3DF48BF4DC&selectedIndex=4

Systemic Symptoms

<table>
<thead>
<tr>
<th>Men and Women</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proctitis: discharge, itching, soreness, bleeding, painful bowel movements</td>
<td>Asymptomatic</td>
<td>Asymptomatic (50%) Mild symptoms mistaken for bladder or vaginal infection</td>
</tr>
<tr>
<td>Pharyngitis: Sore throat</td>
<td>Burning sensation while urinating</td>
<td>Pain or burning while urinating</td>
</tr>
<tr>
<td></td>
<td>White/yellow/green penile discharge</td>
<td>Increased vaginal discharge</td>
</tr>
<tr>
<td></td>
<td>Painful or swollen testicles</td>
<td>Vaginal bleeding between periods</td>
</tr>
</tbody>
</table>

Systemic Complications

<table>
<thead>
<tr>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epididymitis which can lead to infertility</td>
<td>Pelvic inflammatory disease (PID) which can lead to infertility</td>
</tr>
<tr>
<td>Ectopic pregnancy-which can lead to death</td>
<td></td>
</tr>
</tbody>
</table>
Gonorrhea Diagnosis

- Urine
- Swab (vagina, urethra, rectum, throat)
- Culture: The most common test for gonorrhea, followed by:
  - Deoxyribonucleic acid (DNA) probe
  - Polymerase chain reaction (PCR) assay
  - Ligand chain reaction (LCR)

Gonorrhea Diagnosis and Treatment

- Treatments include: Combination Ceftriaxone 250 mg IM single dose with either azithromycin 1 g orally as a single dose or doxycycline 100 mg orally twice daily for 7 days
- Drug resistant strains (Cefixime 400 mg PO single dose no longer recommended as of 2012)

Case #6
PL-29 year old female

- CC: Decreased vision in both eyes, worse in left by 3mos, mild ocular pain, flashing lights, poor mobility
- PMHx: AIDS x 1yr with no prior med.Tx, recent T-cell 4, unaware of other infections
- POHx: No prior ocular diagnosis

Case #6

- BCVA: OD 20/60 OS CF
- External: Trace injection OU
- Slit Lamp: A/C 1+ cells 3+ flare
- Ta: 8 mmHg OU
- DFE: See photos, Vitreous 2+ cells
Case # 6 Assessment

- Extensive CMVR, bilaterally, entire retina and macula OS, macula spared OD secondary to AIDS
- At risk for RD OU

Case #6 Plan

- Referral for anti-CMVR Tx ASAP
- Referral for AIDS Tx

Case #6 Follow-Up

- 2 weeks: Started on Valcyte 900 mg bid PO, Cambivir & Sustiva PO; BCVA: OD 20/100 OS LP
- Exam: Progression of CMVR involving macula OD, RD inferior temporal quadrant OD
Ocular Manifestations

- Cotton wool spot most common non-infectious retinal finding of AIDS
- Cytomegalovirus (CMV) retinitis (most common infectious retinal manifestation) affects 30-40% of severely compromised/widespread retinal necrosis
- Other opportunistic infections (HSV, Toxo, Candida, Cryptococcus) and cancers
- Complications from antiviral therapy

Adnexa and Anterior Segment

- Herpes Zoster Ophthalmicus (HZO) (5-15%)
- Molluscum contagiosum- eyelids
- Conjunctival microvasculopathy 70-80% of patients (incl. comma shaped petechial hemorrhages)

Adnexa and Anterior Segment

- Dry eyes
- Keratitis Kaposi sarcoma 25% of patients (20% involve eyelids or conjunctiva)
- HSV-high recurrence, more resistant to treatment
- Candida (esp. with intravenous drug use)

Adnexa and Anterior Segment

- Iridocyclitis-tends to be mild when associated with retinitis secondary to CMV
- Iridocyclitis-more severe when associated with toxoplasmosis, tuberculosis, syphilis, bacterial or fungal retinitis
- Also associated with HIV medications such as rifabutin or cidofovir

Posterior Segment-Retina

- HIV Retinopathy (cotton wool spots) most common, 50-70% of patients
- Cytomegalovirus (CMV)-retinitis most common intraocular infection (40% advanced cases)
- Most common when CD4 count < 100 cells/µl
- Incidence has declined since advent of HAART (Highly active antiretroviral therapy)
- Several approved drugs including IV ganciclovir sodium, foscarnet sodium and cidofovir) and oral ganciclovir and valganciclovir
- Induction of high dose therapy for 2-4 weeks and low dose therapy for maintenance

DDX:
- Diabetes
- Hypertension
- Systemic Lupus
- HIV Retinopathy
- Alpha interferon retinopathy
### Posterior Segment-Retina

- Acute Retinal Necrosis (ARN)
- Progressive outer retinal necrosis (PORN)
- Infectious choroiditis (most often secondary to Pneumocystis carinii, but also secondary to Toxoplasma gondii, Histoplasma capsulatum, and Cryptococcus neoformans)

### HAART Related Ocular Complications

- Immune recovery uveitis (IRU) defined as vitritis in patients with HAART mediated immune recovery and inactive CMV retinitis (patient complain of floaters) associated with macular edema, epiretinal membrane and retinal neovascularization
- 33% of patients on high doses of Rifabutin experience intraocular inflammation, especially when used with antifungal azole.
- 25-30% of patients on cidofovir experience uveitis and a decrease in IOP in 10% of patients (hypotony and vision loss)

### Neuro-ophthalmic Complications

- 10-15%
- Cryptococcal meningitis
- Menigal and parenchymal lymphoma
- Neurosyphilis
- Toxoplasmosis

### HIV/AIDS (CDC)

#### US
- More than 1.1 million people in the US are HIV+, and approx 20% don’t know
- MSM are most affected in the US
- 2011: 49,273 new HIV infections/yr
- 32,052 diagnosed with AIDS

#### Worldwide (Pandemic)
- 34 million HIV+

### HIV

- Retrovirus
- Infects, destroys CD4+T cells
- Genus: Lentivirus
  - Long incubation/long duration illnesses
  - HIV-1 and HIV-2
- Screening: ages 15-65
- Pregnant women
- High risk, includes those diagnosed with an STD
- PCR testing
**HIV CDC Classification**

- Stage 1: CD4 count ≥ 500 cells/µl and no AIDS defining conditions
- Stage 2: CD4 count 200 to 499 cells/µl and no AIDS defining conditions
- Stage 3: CD4 count ≥ 200 cells/µl or AIDS defining conditions

**HIV/AIDS Transmission**

- Sexual (vaginal, oral, anal)
- Body fluids (blood and blood products: contaminated needles from medical or drug use/blood transfusions)
- Mother to child (during pregnancy, delivery or through breast milk)

**Initial Systemic Manifestations**

- Acute infection: Non-specific influenza-like illness/mononucleosis-like illness 2-4 weeks post exposure (fever, lymphadenopathy, headache, rash, nausea, vomiting, diarrhea)
- Latency-Asymptomatic or chronic HIV 3-20 years without treatment, ave 8 yrs
- End of latency, fever, weight loss, gastrointestinal involvement and muscle aches
- 50-70% generalized lymphadenopathy

**Systemic Manifestations with Progression to AIDS-CD4 Count below 200 cells per µl**

- Pneumocystis pneumonia (40%)
- Cachexia (HIV wasting syndrome 20%)
- Esophageal candidiasis
- Respiratory tract infections
- Opportunistic organisms: bacterial, fungi, viruses, parasites
- Cancers:
  - Kaposi’s sarcoma (10-20%)
  - Burkitt’s lymphoma (cause of death in 16%)
  - Herpes virus
  - Primary nervous system lymphoma
  - Cervical cancer (association with HPV)

**HIV/AIDS Treatment**

- Highly active antiviral therapy (HAART) consists of at least 3 medications of two types of antiviral agents
cART (combination antiretroviral therapy)
- A non-nucleoside reverse transcriptase inhibitor (NNRTI) combined with two nucleoside analogue reverse transcriptase inhibitors (NRTIs) such as AZT and TDF or FTC
- Protease inhibitors added if needed

**References**

- cdc.gov
- http://legacy.revoptom.com/handbook/sect7f.htm (syphilis)