Complications of Chlamydia and Gonorrhea

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Chlamydia and Gonorrhea Complications

• Upper Genital Tract Infection
  – Pelvic inflammatory disease (PID) in women
  – Epididymitis in men

• Complications from Upper Genital Tract Infection
  – Infertility
  – Ectopic pregnancy

• Other Complications
  – Reactive Arthritis
  – Disseminated gonorrhea
  – Increase in HIV transmission/acquisition risk
Case 1

History

• 26yo heterosexual male has increasing pain and swelling of his right scrotum for 2 days. Denies urethral discharge, dysuria, or urinary urgency or frequency. Has had unprotected intercourse with 3 partners in the last 6 months, with his last sexual contact 2 weeks ago. He got kicked 2 days ago in the groin during a fight.

• A genital examination was performed

• Urethral specimens were collected for chlamydia and gonorrhea tests and a urethral Gram Stain was done
• Ceftriaxone 250mg IM x 1 and Doxycycline 100mg BID x 10 days
• Pt sent to urgent care for ultrasound to rule out torsion
• Scheduled for follow-up in 72 hours
• Requested to refer sexual partners for evaluation and treatment

http://www.siamhealth.net/Disease/infectious/std/Epidi.htm
Epididymitis
Epidemiology and Clinical Findings

- Epididymitis: inflammation of epididymis usually due to infection
- Believed to occur in 1 to 4 per 1000 men per year
- May be accompanied by urethritis (may be asymptomatic)
- Symptoms: unilateral testicular pain and tenderness
- Signs: tender/swollen testicle and/or scrotum, palpable swelling and tenderness of the epididymis, urethral discharge or hydrocele may be present
Epididymis Anatomy

NORMAL

EPIDIDYMYSIS

→ Epididymis receives sperm and seminal fluid from the efferent ducts, and here sperm mature becoming motile and fertile

Galejs LE, Kass EJ. Am Fam Physician 1999;59

Junnila J, Lassen P. Am Fam Physician 1998;57
Epididymitis Etiology

Heterosexual men < 35 (and MSM)

- Usual etiology
  - *C. trachomatis* 60-80%
  - *N. gonorrhoeae* 5-20%

- Predisposing factors
  - Sexually transmitted urethritis

Older men (and MSM)

- Usual etiology
  - Coliforms (esp. *E. coli*) account for more cases

- Predisposing factors
  - Underlying genitourinary pathology or bacterial prostatitis
  - Sexually transmitted in MSM
Etiologies of Epididymitis

Associated with Urethritis

Gonorrhea, Chlamydia, Trichomoniasis

Associated with Bacteriuria

Coliform bacteria (e.g. *E. coli*), *Pseudomonas aeruginosa*

Associated with Funguria

*Candida* spp.
Etiologies of Epididymitis

- Associated with Systemic Infection
  - **Bacterial** → TB, MOTT, Brucellosis, *Haemophilus influenzae*, *Listeria*, *Streptococcus*
  - **Fungal** → *Histoplasmosis*, *Coccidioidomycosis*, *Blastomycosis*, *Cryptococcosis*
  - **Viral** → *Mumps*, *Cytomegalovirus*
  - **Parasitic** → *Schistosomiasis*, *Sparganosis*, *Bancroftian filariasis*
Etiologies of Epididymitis

- Associated with Drugs
  - Amiodarone
- Associated with a Systemic Vasculitis or Inflammatory Diseases
  - Behcet’s, Henoch-Schönlein purpura, polyarteritis nodosa, granulomatosis with polyangiitis, sarcoidosis
- Associated with a Post-Infectious Etiology
  - Upper respiratory tract infections (viral and atypical bacterial)
- Associated with Trauma
Epididymitis
Differential Diagnosis

- Varicocele
- Inguinal hernia
- Spermatocele
- Injury (Trauma)
- Torsion

- Ureteral obstruction from nephrolithiasis (renal colic)
- Tumor
Epididymitis Evaluation

- History
- Examination of the external genitalia
- Palpation of scrotum and its contents
- Prostate exam if indicated by history
- Gram stain of urethral exudate
- Test for chlamydia and gonorrhea and/or urine culture
- Rule out testicular torsion if indicated
Epididymitis Management

- Likely cause is *N. gonorrhoeae* or *C. trachomatis*:
  - Ceftriaxone 250mg IM x 1 + Doxycycline 100mg PO x 10 days
- Likely cause is enteric bacteria:
  - Ofloxacin 300mg PO BID OR Levofloxacin 500mg PO QD x 10 days
- For MSM, consider ceftriaxone plus fluoroquinolone
- Bed rest, scrotal elevation, and analgesics
- Hospitalize
  - Severe pain suggesting complications or other diagnoses
  - Fever
  - Noncompliant
- Sexual partner referral for evaluation and treatment
- Evaluate for clinical improvement within 72 hours

CDC 2010 STD Treatment Guidelines
Epididymitis Complications

- Infertility or Decreased fertility
  - More common in bilateral disease
  - Inflammation of the epididymis leads to epididymal and efferent ductule obstruction
  - Occasionally spontaneously reversible
- Chronic epididymitis with chronic pain (15% of cases)
  - Generally considered idiopathic
  - Often unresponsive to antibiotics
- Abscess formation and infarction of the testicle
  - Inflammation of vas leads to vascular compromise
  - Less common since the use of antibiotics
  - Surgical drainage and possibly orchiectomy
Case 2

History

• 18 yo female presents with 5 days of vaginal discharge, pelvic pain, nausea, and low grade fever. She douches frequently and has a history of gonorrhea 2 years ago. She had unprotected intercourse with a new partner 2 weeks ago.

• A genital examination was performed.
• Endocervical specimens were collected for chlamydia and gonorrhea tests.
• A wet mount revealed 20 WBCs per 400x and a pH<4.5, otherwise unremarkable.
• Cervical motion tenderness and right adnexal tenderness were noted
• Ceftriaxone 250mg IM x 1 and doxycycline 100mg PO BID x 14d
• Scheduled for follow-up in 72 hours
• Requested to refer sexual partners for evaluation and treatment

http://www.brooksidepress.org/Products/Military_OBGYN/Textbook/Discharge/Discharge.htm
Female Pelvis Anatomy

Normal

PID

http://iuhs-isa.org/USMLE/Reproduction/FemaleReproduction1.htm
PID

http://www.endo-resolved.com/images/adhesions.jpg
**PID**

**Epidemiology and Clinical Findings**

- Occurs in 1 million women in the US annually
- Significant associated morbidity
- Broad spectrum of symptoms:
  - Asymptomatic
  - Painful intercourse, vaginal bleeding, vaginal discharge
  - Fever
  - Abdominal pain, pelvic pain, adnexal pain
- Proportion of clinical manifestations
  - Subclinical/silent 60%, Mild-Moderate 36%, Severe 4%
- Recent trends suggest a decrease in hospitalized cases and outpatient visits
PID Etiology

STD

• More common (around 40-50%)
  – *C. trachomatis*
  – *N. gonorrhoeae*

• Less common or frequency unknown (other 50-60%)
  – *Mycoplasma genitalium and M. hominis*
  – *Ureaplasma urealyticum*
  – Anaerobes: *Bacteroides fragilis*, peptostreptococci
  – *H. influenzae*

Puerperal, Post-abortion, Post-instrumentation

Polymicrobial (*Staphylococcus, Streptococcus*, Coliforms, *Clostridium perfringens*, etc.)
PID Risk Factors

• Increased Risk
  – Douching
  – IUD
  – Demographics (younger, lower SES, nonwhite)
  – Prior PID and prior GC
  – Menses (loss of mucus plug, introduction of vaginal bacteria)
  – Bacterial vaginosis

• Decreased Risk
  – Pregnancy
  – Oral contraceptives (for *Chlamydia trachomatis* only)
  – Depo provera or Norplant (thicker cervical mucus)
PID Evaluation

- Vital signs
- Speculum evaluation
- Gram stain of cervical swab low sensitivity and specificity and now not routinely done in women
- Test for chlamydia and gonorrhea
- Bimanual and abdominal examination
  - Finding of cervical motion tenderness or adnexal or fundal tenderness sufficient for empirical therapy
- Determine need for hospitalization
PID: Indications for Hospitalization

- Inability to exclude surgical emergency (ectopic pregnancy or appendicitis)
- Pelvic abscess
- Pregnancy
- Inability to reliably take oral meds
- Outpatient treatment failure
- Clinical follow-up in 72 hours can not be arranged
2010 CDC STD Treatment Guidelines

PID Hospitalized

Recommended:
- Clindamycin 900mg IV Q8h + Gentamicin 2 mg/kg IV/IM load then either 1.5 mg/kg IV/IM Q8h or 3-5 mg/kg IV/IM Q24h
- Cefotetan 2g IV q12h or Cefoxitin 2g IV q6h + Doxycycline 100mg PO/IV q12h

Alternative Parenteral:
- Ampicillin/Sulbactam 3g IV Q6h + Doxycycline 100mg PO/IV q12h

- Quinolones are no longer recommended for empiric PID treatment due to resistance in gonorrhea
- After 24h improvement, change to Clindamycin 450mg po qid or Doxycycline 100mg po bid to complete total 14 days
2010 CDC STD Treatment Guidelines

PID Outpatient

- Ceftriaxone 250mg IM (or other parenteral 3rd generation cephalosporin) or Cefoxitin 2g IM (plus Probenecid 1g PO) + Doxycycline 100 mg po bid to complete for 14 days w/ or w/o metronidazole 500mg PO BID for 14 days

➔ Quinolones are no longer recommended for empiric PID treatment due to resistance in gonorrhea
Other PID Management Issues

- Evaluate for clinical improvement within 72 hours
- Refer sexual partners for evaluation and treatment
- Rescreening for chlamydia and gonorrhea 3-6 months after therapy completion if these pathogens are identified
PID Complications: Infertility

• Inflammation and associated tissue repair from PID leads to tubal occlusion and tubal adhesion (intraluminal and extraluminal)

• Of all infertile women, >15% are infertile due to tubal damage from PID

• Infertility development by # of PID episodes
  – One episode: 8%
  – Two episode: 20%
  – Three episodes: 40%

• Overall, estimated 20% of women with PID will become infertile

Westrom et al. Sex Transm Dis 1992;19
PID Complications
Ectopic Pregnancy

- Implantation occurs at a site other than the endometrium
  - Tubal location 96%: rare ovary, cervical, abdomen
- Abdominal pain and irregular vaginal bleeding are the most common presenting symptoms
- Risk for ectopic pregnancy after PID increased 6-10 fold
- Recent trends suggest a decrease in hospitalized cases in the US
Other PID Complications

- **Chronic pelvic pain**
  - Overall occurs in up to 20% following PID
  - Range 12 to >50% with one to multiple PID episodes
  - Etiology for pain not clear, but likely related to pelvic adhesions versus chronic tubular inflammation

- **Bowel obstruction secondary to adhesions**

- **Perihepatitis ("Fitz-Hugh-Curtis Syndrome")**
  - Inflammation of liver capsule and adjacent peritoneum
  - Dense adhesions form between liver capsule and abdominal wall
  - Usually due to chlamydia or gonorrhea
  - Importance in excluding other disease and revealing underlying salpingitis

Holmes et al. Sexually Transmitted Diseases, 3rd ed
Case 3

History

22yo heterosexual male construction worker presents with worsening pain in his left ankle and right second toe for 3 days. He recalls mild painful urination and small amount of clear urethral discharge 3 weeks prior, which he attributed to “rough sex” after heavy alcohol intake. He complains of watery, itchy eyes, but denies a rash.
Reactive Arthritis

- Aseptic inflammatory polyarthritis that usually follows:
  - nongonococcal genitourinary infection (mainly *Chlamydia*, possibly GC)
  - infectious dysentery (*Salmonella*, *Shigella*, *Campylobacter*, *Yersinia*, etc)
- Linked to expression of HLA-B27 antigen in many but not all cases
- Initial manifestations and natural course more aggressive in HLA-B27 haplotypes
- Male predominance M > F 2:1
Reactive Arthritis
Clinical Manifestations

• Classic triad of findings (not in all patients)
  – associated trigger infection: urethritis or cervicitis or enteritis
  – rheumatoid factor-negative asymmetric polyarthritis
    • knee, ankle, digits, sacroiliac, enthesitis (esp. achilles)
  – conjunctivitis
Reactive Arthritis
Clinical Manifestations

Other clinical findings

- mucocutaneous disease
  - Eye: uveitis
  - Skin (dermatitis): keratoderma blennorrhagica, balanitis circinata
  - Oral: painless mucosal ulcers
- cardiac (uncommon)
  - heart block, myocarditis, pericarditis, aortitis
- neurologic (rare)
  - peripheral neuropathy, meningoencephalitis
Reactive Arthritis Syndrome

[Images of various skin conditions]

www.emedicine.com/derm/topic207.htm
Reactive Arthritis Syndrome

http://www.rad.washington.edu/mskbook/axialarthritis.html
Reactive Arthritis Syndrome Management

- Antibiotics
  - conflicting data on whether antibiotics alter natural course of initial reactive arthritis episode once it develops, but data suggest antibiotics may decrease recurrences
  - antibiotics may be more efficacious when caused by STD rather than enteritis
  - ideal length of therapy unknown
Reactive Arthritis Syndrome Management

- **Anti-inflammatory agents**
  - indomethacin or NSAIDs (ASA and po steroids probably not effective)
  - intra-articular steroid injection
  - methotrexate, sulfasalazine, or immuran in severe cases
18 year old female developed pain in her left shoulder and left elbow 3 days prior to admission (PTA). This pain resolved a day later, but she then developed pain in her left knee, right ankle and right achilles tendon. This same day she developed fever and about 15 skin lesions involving both hands and feet. One day prior to admission, her right ankle become hot and swollen. She denies any vaginal discharge or pelvic pain. Her last menstrual period ended 5 days ago.
Disseminated Gonococcal Infection (DGI) 
Epidemiology

- Disseminated infection from gonococcal bacteremia
- Occurs in 0.5 to 3% of infected patients and prevalence decreasing
- Certain GC strains possess biological properties facilitating dissemination
- Risk factors
  - female
  - complement defect(s): C5-C9 pathway (13% of patients)
  - menstruation: pH and hormonal changes
  - Pregnancy
DGI Clinical Manifestations

- Most commonly present as **“arthritis-dermatitis” syndrome**
- Clinical features
  - Fever
  - Migratory polyarthritis (monoarticular uncommon)
    - Wrists, knees, and small joints common
  - Septic arthritis in 1 or 2 joints
  - Tenosynovitis
  - Rash: 5-40 papules and pustules with hemmorhagic base, mostly on distal extremities
  - GC culture positive up 80% from urogenital site, <50% from blood or synovium
  - RARE: meningitis, endocarditis, osteomyelitis, sepsis, ARDS
DGI Treatment

• Hospitalization is recommended initially
• Recommended treatment
  – Ceftriaxone 1g IV/IM q24h
• Alternative treatment
  – Cefotaxime 1g IV q8h
  – Ceftizoxime 1g IV q8h
• Also provide chlamydia treatment

➔ Quinolones are no longer recommended for empiric DGI treatment due to resistance in gonorrhea

CDC 2010 STD Treatment Guidelines
DGI Treatment

• Inpatient regimens should be continued for 24 to 48 hours after improvement begins, after which therapy may be switched to the following PO med if septic arthritis or complications are absent:
  – Cefixime 400mg PO twice daily

• Oral therapy is continued until at least one week of antibiotic therapy has been completed

CDC 2010 STD Treatment Guidelines
Summary

- Epididymitis and PID occur when chlamydia, gonorrhea, or other pathogens spread to the upper genital tract
- Compliance and repeat clinical evaluation in 72 hours must be ensured for epididymitis and PID
- Consider the need to rule out testicular torsion in patients evaluated for epididymitis
- Infertility and ectopic pregnancy are long-term sequelae of PID
- Reactive arthritis occurs following urethritis, cervicitis, or enteritis, it affects multiple organ systems, and it requires antibiotics and anti-inflammatory medications
- Disseminated gonorrhea requires hospitalization initially and the recommended initial antibiotic is IV/IM ceftriaxone