American Urological Association
Education & Research, Inc.

Infections of the Male Lower Urinary Tract

Content Created By:
Joseph P. Alukal, MD
NYU Langone Health

Presented By:
Robert J. Evans, MD
Wake Forest Baptist Health

GU Infection – General Principles

- Bacteriuria – different from urinary tract infection; second implies invasion of GU tract
- Unresolved bacteriuria – failure to eradicate the infecting organism; possibly due to:
  - Bacterial resistance
  - Multi-organism infection
  - Rapid reinfection
  - Azotemia/papillary necrosis
  - Infected calculi, tumors, or foreign bodies
  - noncompliance

GU Infection – General Principles

- Laboratory Diagnosis
  - Voided urine – midstream clean catch
  - Prostatic secretions – either semen culture or prostate massage
    - 1st ten ml (VB1) equals urethral flora
    - Midstream specimen (VB2) is bladder flora
    - Expressed prostate secretions (EPS) are prostate flora
    - Final specimen (VB3) is combined bladder and prostate flora

GU Infection – Lab Diagnosis

- Centrifuged urine – should be examined under high power (>100x)
- Pyuria - > 5 leukocytes per HPF in a male
- Urine dipstick – can identify leuk esterase and nitrite (present if *enterobacter* are present)
- Urine culture – number of CFU/ml and sensitivities are important

GU Infection – General Principles

- Infection of the Male Lower Urinary Tract
  - Distinguish dysuria/chronic pelvic pain from cystitis/prostatitis
  - Identify bacterial orchitis/epididymitis
  - Identify STDs
- Diagnostic overlap is a dilemma

GU Infection – General Principles

- Prostatitis/Chronic Pelvic Pain Syndrome
  - 50% of men experience prostate symptoms at some time (NIH International Prostatitis Collaborative Network)
  - NIH Categorization
    - Category I – acute bacterial prostatitis
    - Category II – chronic bacterial prostatitis
    - Category III – pain in the absence of bacteria (IIIa – with leukocytes; IIIb – without leukocytes)
    - Category IV – asymptomatic inflammatory prostatitis – with leukocytes, without bacteria

GU Infection – Prostatitis/Chronic Pelvic Pain Syndrome

- Acute bacterial prostatitis (Category I)
  - Sudden onset of pelvic pain, fevers, chills, LUTS
  - Urine or semen culture is diagnostic as a first step
  - Imaging (TRUS, CT, MRI) can be used to r/o prostatitis abscess
  - Culture specific antibiotics are appropriate; initial coverage with trimethoprim/sulfamethoxazole is appropriate
  - Quinolones less commonly used given risk of tendon rupture

GU Infection – Prostatitis/Chronic Pelvic Pain Syndrome

- Chronic bacterial prostatitis (Category II)
- Suspected when VB3 has > 12 leuks/HPF even after antibiotic treatment
- Antibiotic regimens include quinolones (again risk of tendon rupture is real) and TMP/SMX

GU Infection – Prostatitis/Chronic Pelvic Pain Syndrome

- Category III
  - May benefit from alpha blockers, pelvic floor physical therapy, anti-inflammatories
  - If voiding symptoms predominate as opposed to pain, an appropriate workup for LUTS is indicated (uroflometry, cystoscopy, urodynamics)

GU Infection – Orchitis/Epididymitis

- Orchitis – hematogenous spread during bacterial or viral infection
- Testicular pain or swelling, fevers, or chills
- Transient impact on sperm count
- Cultures (urine, semen, blood) may not be positive

GU Infection – Epididymitis

- Acute vs chronic epididymitis
  - Retrograde seeding of bacteria (or STI) is possible
  - Culture specific antibiotics again ideal; may nor be possible
  - Physical exam – intact cremasteric reflex distinguishes from torsion (Prehn's sign)
  - Doppler ultrasound useful for r/o torsion and id of abscess

GU Infection – Male Venereal Disease

- Gonococcal urethritis – caused by *N. gonorrheae* – gram negative diplococcus
- 35% of men have concomitant chlamydia; treatment with both azithromycin and ceftriaxone is appropriate
- Diagnosis is make with intraurethral swab and culture or urine PCR

GU Infection – Male Venereal Disease

- Non - gonococcal urethritis – caused typically by *chlamydia trachomatis;* may also be due to *ureaplasma*, *T. vaginalis*, or yeast
- Mucoid urethral discharge is characteristic; diagnosis is made using urethral swab or voided urine for PCR
- *Trichomonas vaginalis* infection is diagnosed with saline smear; treatment is metronidazole 2g

GU Infection – Male venereal disease

- Herpes – genital herpes may be caused by either HSV1 or 2
- Painful ulcerated lesions of the penis or other external genitalia
- Incubation period may be as long as 30 days
- Tzank smear is diagnostic; HSV IgG and IgM testing is far more commonly performed
- Treatment is acyclovir 1000mg daily x 7 days
- Suppressive treatment with daily acyclovir is commonly offered for recurrent outbreaks

GU Infection – Male Venereal Disease

- Genital warts – caused by viral infection of the human papilloma virus family
- Risks are transmission to partners (and increased risk of anal, head/neck, or cervical cancer) as well as increased risk of penile cancer
- Types 16, 18, 31, 33, 45, 52, and 58 predispose to malignancy (not necessarily warts – types 6 and 11)
- GARDASIL® vaccine is FDA approved to prevent infection in both boys and girls

GU Infection – Male Venereal Disease

- Molluscum contagiosum – caused by a poxvirus infection obtained through contact
- Central ulceration
- Treated with liquid phenol

GU Infection – Male Venereal Disease

- Syphilis – infection with *Treponema pallidum* causes nontender rubbery ulcers
- *VDRL* testing is positive only weeks after infection
- Dark-field microscopy of the lesions is diagnostic
- Treatment is Pen G or Doxy if patient is pen allergic

GU Infection – Male Venereal Disease

- Chancroid – h.ducreyi
- Gram stain of ulcer is diagnostic; this may be confused with syphilis
- Treatment is azithromycin or ceftriaxone