BIOLOGY 113 - MICROBIOLOGY

Lecture 37: Microbial Diseases of the Urinary and Reproductive Systems

Genital and urinary tract infections
- Physiological defenses of the urinary tract - mechanical flushing action, acidic pH of urine, phagocytes in the urinary tract, immunoglobulins produced by cells in the bladder and kidneys
- Normal urinary tract flora present only in the distal urethra, usually related to GI tract flora
- Cystitis - bladder infection, quite common
  = May be asymptomatic, revealed only by presence of bacteriuria
  = Women more susceptible than men for anatomical reasons
  = Accurate diagnosis requires quantitative determination of bacterial counts in urine
- Kidney infections
  = Pyelonephritis usually results from ascension of bladder infection, a good reason for prompt treatment of cystitis
  = Glomerulonephritis usually results from deposition of immune complexes
- Gonorrhea, infection by *Neisseria gonorrhoeae*, a microaerophile
  = *Neisseria gonorrhoeae* does not invoke an effective immune response
  = May be asymptomatic in females
  = Spread of penicillinase-producing *Neisseria gonorrhoeae* (PPNG) has interfered with treatment
  = Untreated gonorrhea can lead to pelvic inflammatory disease in women
  = Short incubation period hampers control efforts
- Syphilis, infection by *Treponema pallidum*
  = Agent can't be grown in vitro, must be diagnosed serologically
  = Proceeds through several stages, secondary stage is systematic, tertiary stage is noninfectious but degenerative
- "Nonspecific STDs", nongonococcal urethritis and nonspecific vulvovaginitis, are caused by a variety of microorganisms
  = *Chlamydia trachomatis* - obligate intracellular parasite causing a variety of infections, may be difficult to detect and control
  = *Ureaplasma urealyticum* - mycoplasma, major contributor to fetal death due to placental passage
  = *Gardnerella vaginalis* - Gram negative bacterium; causes inapparent infection in men
- Genital herpes - caused by Herpes Simplex type II
  = Like other herpes infections, recurrent infections and latent periods
  = Most serious hazards - transfer to infants during delivery can lead to systematic herpes in the baby; chronic infection of the cervix has been statistically associated with increased risk of cervical cancer
- Pelvic inflammatory disease - inflammation of pelvic organs; complication of STDs or ascending vaginitis; major cause of sterility
- Endometritis - infection of uterine lining; usually due to trauma; may lead to fatal septicemia
- Toxic shock syndrome - caused by toxins produced by certain strains of *Staphylococcus aureus*; association with use of high-absorbency tampons
- Prostatitis - prostate gland infection; common among elderly men; treatment hampered by difficulty in delivering antimicrobial drugs to the prostate fluid

Prenatal and perinatal infections
- Intrauterine infections of any sort are very serious, since they can be teratogenic
  = Cytomegalovirus - CMV is a very common herpesvirus; intrauterine infection with CMV may be an important cause of mental retardation in children
  = Congenital rubella syndrome - severe congenital damage caused by rubella infection in the first trimester
- Toxoplasmosis - caused by protozoan *Toxoplasma gondii* acquired from contaminated meat or cat feces
- Neonatal infections may be severe due to immunologic naivety of neonates
  - Neonatal sepsis from systemic infection by Type B streptococci obtained from delivery
  - Bacterial meningitis from a number of pathogens
  - Infant botulism - *Clostridium botulinum* can grow in the infant GI tract