

- Infections in immunocompromised host
 - Objectives
 - Briefly outline various immunodeficient states and enumerate common infections in particular immunodeficiency states
 - Discuss pathogenesis and transmission of infections in immunocompromised host
 - Describe briefly lab tests in diagnosing infections in immunocompromised.
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- Compromised host
 - Compromised hosts are people with one or more defects in their defences against microbial invaders

- Suffer severe or life threatening infections
- Factors that make a host compromised
- Defects in innate immunity
 - Primary defects are inherited or occur by exposure in utero
 - Secondary defects is due to an underlying disease state or treatment of a disease
- Defects in adaptive immunity
 - Primary defects are inherited or occur by exposure in utero
 - Secondary defects is due to an underlying disease state or treatment of a disease
- Primary defects in innate immunity
- Congenital defects in phagocytic cells

- Repeated pyogenic infections e.g *Staph aureus*
- Examples
 - Chronic granulomatous disease
 - No oxidative burst by phagocytes
 - Jobs syndrome
 - Chediak hegashi syndrome
- Inherited complement deficiencies
 - Repeated pyogenic infections
 - Neisseria infections
- Secondary defects in innate immunity
- Disruption of body mechanical barriers
 - Skin damage by burns, trauma, surgery etc
 - *Pseudomonas aeruginosa* infection in burns
 - *Staph aureus* , gam negative infections in wound
 - Mucosal damage by instrumentation

- Devices such as catheters, prostheses, shunts, allow organisms to bypass defenses and enter sterile sites
 - *Staph epidermidis* infection
- Defective phagocytic functions
 - Diabetes mellitus
- Primary defects in adaptive immunity
- Congenital B cell deficiencies
 - Brutons disease
 - Pyogenic infections
 - IgA deficiency(failure of immunoglobulin switching)
 - Sinus and lung infections
- Congenital T cell deficiency
 - Thymic aplasia(Di george syndrome)
 - Viral, fungal and protozoal infections
 - Failure of formation of pharyngeal pouch
 - Chronic mucocutaneous candidiasis(failure of T cells to respond to candida)

- Widespread candidal infection
- Primary defects in adaptive immunity
- Congenital B & T cells deficiency
 - Severe combined Immunodeficiency(SCID)
 - Inherited defect of Gene encoding interleukin-2 receptors . Without the receptors the T-cells and B-cells are unable to communicate with each other
 - Repeated bacterial(pyogenic) , fungal, viral and protozoal infections
- Secondary defects in adaptive immunity
- Malnutrition(protein deficiency)
- Infections(e.g. HIV infection → loss of helper T cells)
- Neoplasia(nutritional competition btw normal and cancerous cells)

- Medical treatment
 - Organ transplant
 - Immunosuppressant therapy
 - Radiotherapy affects proliferation of T cells
- Splenectomy(impaired humoral responses)
 - Severe infections with capsulated bacteria
- Opportunistic infections
- Important opportunistic pathogens
- Bacteria
 - Gram positive
 - Staph aureus
 - Pyogenic infections
 - Staph epidermidis and other coagulase negative staph
 - Device related infections
 - bacteremia
 - Nocardia spp.
 - Pneumonia
 - Abscesses in various organs

- Gram negative
 - Enterobacteriaceae
 - Pyogenic infections and septicemia
 - Pseudomonas aeruginosa
 - Burn wound infections
 - Others
 - Mycobacterium tuberculosis
 - Tuberculosis
 - Mycobacterium avium intercellulare
 - Severe diarrhea and pneumonia in AIDS pts
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- Fungi
 - Candida sp
 - Oral thrush
 - Skin infections
 - Candidemia and abscess
 - Cryptococcus neoformans
 - Meningitis
 - Pneumonia
 - One of the AIDS defining illness
 - Pneumocystis jirovecii

- Severe Pneumonia (imp in AIDS pts)
- Aspergillus sp
 - Invasive lung infection
- Mucor sp
 - Invasive lung, sinuses and brain infection

- Parasites
 - Toxoplasma gondii
 - Retinitis
 - Encephalitis
 - Pneumonia
 - Important in AIDS pts
 - Cryptosporidium parvum
 - Diarrhea in AIDS pts
 - Isospora belli
 - Diarrhea in AIDS pts

- Viruses
 - Cytomegalovirus

- eosophagitis, pneumonia, retinitis, diarrhea
 - Herpes Simplex Virus
 - oral & genital herpes
 - Human Papilloma Virus
 - HPV, genital warts, anal/cervical cancer
 - Epstein barr virus
 - Hairy leukoplakia
 - Herpes zoster virus
 - shingles
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- Transmission of infection in immunocompromised host
 - Endogenous infection
 - Patients own microbial flora
 - Exogenous infection
 - Infection enters the body through any of the exogenous routes
 - Respiratory

- Feco-oral
 - Sexual
 - contact

- Laboratory diagnosis of infections in immunocompromised patients
- Bacterial infection
 - Microscopy
 - Gram stain
 - Cultural & sensitivity
 - Serology (antigen/antibody detection)
 - PCR
- Viral infections
 - Serology
 - PCR, RT-PCR
 - Viral cultures
- Fungi
 - Fungal cultures on saboraud agar
 - Microscopy
 - Lactophenol blue stain
 - India ink (cryptococcus)

- Parasites
 - Serology(toxoplasma)
 - Modified acid fast stain(cryptococcus parvum)