

Osteomyelitis

- Definition: Inflammation of bone and its marrow, regardless of whether it is due to pyogenic organism, TB, syphilis, a specific virus or the presence of FB.
- The root words *osteon* (bone) and *myelo* (marrow) are combined with *itis* (inflammation) to define the clinical state in which bone is infected with microorganisms.

- **Classification: (Campbell)**

- **A. According to duration:**

- 1. Acute osteomyelitis. (< 2weeks) (Early acute and late acute (After 4/5 days)
- 2. Subacute osteomyelitis. (up to 3 weeks) (2-3 weeks) (2-6 weeks)
- 3. Chronic osteomyelitis. > 3 weeks.

- **B. According to the mechanism of action:**

- 1. Exogenous (Trauma, operation, pinprick, stab wound, laceration)
- 2. Haematogenous (Endogenous) (Throat, GI Tract, boil, septicemia, infected umbilical cord)

- **C. According to the type of host response to the disease:**

- 1. Pyogenic (nonspecific) : Bacterial
- 2. Non- pyogenic (specific) : TB, Fungal, Parasites- Hydatid , Viral)

• GENERAL ASPECTS OF INFECTION

- • **Inflammation:** Is a complex reaction to injurious agents such as microbes and damaged, usually necrotic, cells that consists of vascular responses, migration and activation of leukocytes and systemic reactions. (Robins and Cortan)
- • **Infection** is the local & systemic response of living tissue to the invasion of a pathogenic organism's, their multiplication, and the toxin/ enzymes they produce.
- • The signs of inflammation are recounted in the classical mantra: *redness, swelling, heat, pain and loss of function.*
- • In one important respect, bone infection is more susceptible than soft tissues to vascular damage and cell death.

• **Mode of spread of musculoskeletal infection:**

- • Direct introduction through the skin
 - • a pinprick,
 - • an injection
 - • a stab wound
 - • a laceration
 - • an open fracture
 - • an operation, particularly when biomaterials are implanted
- • *direct spread from a contiguous focus of infection*
- • *Indirect spread via the bloodstream from a distant site* such as the nose or mouth, the respiratory tract, the bowel or the genitourinary tract.

- **General Principle of Infection treatment:**

- **1. Identify the infecting organism and administer effective antibiotic treatment or chemotherapy.**
- **2. Provide analgesia and general supportive measures,** including rest of the affected part or splintage of the affected joint.
- **3. Release pus as soon as it is detected.**
- **4. Eradicate avascular and necrotic tissue.**
- **5. Stabilize the bone if it has fractured and restore continuity if there is a gap in the bone.**
- **6. Maintain or regain soft-tissue and skin cover**

- **Epidemiology:**

- • Age: Infancy and childhood.
- • Sex : Males predominate 4:1
- • Location: Metaphysis of long bone.
- • H/O trauma may be present.
- • Poor nutrition, unhygienic surroundings, antecedent focus of infection (boil, tonsillitis)
- • The causal organism in both adults and children is usually *Staphylococcus aureus* (found in over 70% of cases).
- • When adults are affected it is due to lowered resistance.
- • Trauma may determine site of infection. Small haematoma or fluid collection causes bacteremia.

- Q) What are the risk factors of osteomyelitis?
- Risk factors / Predisposing factors of osteomyelitis:
- ⇒ Open fracture,
- ⇒ Deep punctured wound,
- ⇒ Iatrogenic injury / Surgery,
- ⇒ Immuno suppressive conditions:
 - ✓ Chemotherapy,
 - ✓ Haemodialysis,
 - ✓ Steroid therapy,
 - ✓ Poorly control DM,
 - ✓ Malnutrition.
- ⇒ Diseases impair blood circulation can predispose to OM:
 - ✓ DM,
 - ✓ PVD,
 - ✓ Sickle cell disease.
- ⇒ Intravenous drug abuser,
- ⇒ Catheter or I/V line induced infection.

- Organisms responsible for acute osteomyelitis:

- $\Rightarrow$ Neonate:

- ✓ E coli,
- ✓ Strep B haemolyticus.

- $\Rightarrow$ Child < 4 years:

- ✓ E coli,
- ✓ Haemophilus influenzae,
- ✓ Pseudomonas,
- ✓ Proteus.