**BONE INFECTION (OSTEOMYELITIS)**

Objectives of this discussion.

* **Definition Of OM**
* **Classification Of OM**
* **Risk Factors**
* **Clinical Features**
* **Investigations**
* **Management Of OM**
* **Complications**

**Definition of Om;**

Osteomyelitis is defined as infection of the bone and bone marrow respectively

Or

Inflammation of the bone caused by infecting organisms.

We also need to define the following terms which are related to OM they include;

1. **Involcrum** -a layer of new bone growth outside the existing bone
2. **Sequestrum** - Is a segment of necrotic bone that becomes separated from the normal bone during the process of necrosis.
3. **Sequestrectomy** - surgical procedure involving removal of dead bone (sequestrum).
4. **Saucerization -**surgical excavation of tissue to form a shallow depression to facilitate drainage from infected areas.

**Classification of osteomyelitis**

Osteomyelitis is classified according to;

(1**).Duration >acute osteomyelitis-presents 2 weeks after bone infection**

-characterized by inflammatory bone changes

>**sub-acute osteomyelitis**-a chronic low grade infection of a bone

-Presents for 2-3 weeks after infection

-characterized by a lack of systemic manifestation

-onset is insidious and pain is the most common symptom

>**chronic osteomyelitis**-presents 6 or more weeks after bone infection

-characterized by bone destruction and formation of

Sequestrium.

(2).**Mechanism of infection >exogenous osteomyelitis**- Is caused by open fractures, surgery or

Contagious spread from infected tissue.

>**hematogenous osteomyelitis**- usually from bacteremia

-usually bacteria from a distant focus

Will be carried by blood hence name

Hematogenous and then settle in

The metaphysis with its slow

Circulation.

Risk factors of osteomyelitis

(1).Local –poor tissue perfusion

- Open fracture

-severe soft tissue injury

(2).systemic –impaired immunocompetence ability of a body to produce a normal immune response (infections, immunosuppression)

-systemic diseases (diabetes mellitus)

-Iv drug users

(3).microbial-high virulent pathogens.

This pathogen include the staphylococcus .Aures which is most common for acute hematogenous o.m accounting for >95% of the cases,H.Influenza ,streptococcus,E.coli,pseudomonas all accounting for 5% of the cases.

Acute hematogenous osteomyelitis

Refers to infection of the bone which results from bacteria in the bloodstream.

Most common type of infection seen in childrenand young caused by gram positive bactreia which is staphylococcus aureus.less coomon in adolescents and adults in adults risk factors are immune-compromised status,diabetics ,drug addiction .

More common in males and its ratio to male to females is 5:1 Its causes include bacteraemia ,or bacteriogical seeding of bone generally which is associated with other factors such as localized trauma ,chronic illness,malnutrition or inadequate immune system.

Pathology

The pathology begins with the *entrapment of an infective embolus* in the metaphysis of the long bone,it isnsaid to get entrapped in this region because of the following reasons

>metaphysis is more vascular

>most of the arteries are end arteries

>relative lack of phagocytosis (ingestion of a microbe )

*Avascular necrosis occurs distal to the block* the dead tissue act as a good media for the bacteria to multiply at the same time the body mechanism try to overcome the infection hence formation of an exudate (mass of cells and fluid that has seeped out of bllod vessels especially in inflammation)when the body overcomes the infxn then a small exudate forms which is absorbed and no further destruction but if the organisms is of high virulence and body mechanism fails to overcome infxn the process of destruction continues and a larger exudate forms and a bone abscess forms .thsu large exudate creates pressure on the surrounding vessels causing compression and further ischemia and necrosis.

*The bone abscess formed hence has to find its way out* its path is blocked proximally by the epiphysis and the growth plate it flows down the medullary canal thus there is development of intramedullary subperiosteal abscess *and* ultimately finds its way out by breaking the subcutaneous tissue and the skin and sinus of chronic Om develops this process takes about 14 -21 days

*Part of bone between the intramedullary and subperiosteal loses the blood supply thus resulting in formation of sequestrum.*At the same time the periosteum forms a new bone known as involcrum.

**Clinical features**

Swollen, tender limb with limitation to movement

Abrupt onset of high grade fever

Signs of systemic toxicity

Effusion may be present in the neighbouring joints

**Investigations**

**>Blood investigations**

Hb%-may be low normal for male is 13.5-17.5g/dl women 12.0-15.5 g/dl

Increase in neutrophils 1500-8000mm3

ESR elevated

Blood culture for the organism is positive

**> Radiological**

Does not show any sign because infxn is in the early stage

The first sign of radiological is periosteal elevation which takes place 2-3 weeks

Sequesstrum and involcrum seen during 4-6 weeks.

**Treatment**

Aim is to eradicate infxn and prevent development of C.O.M

>Antibiotics -broad spectrum bacteria amoxicillin ,clavunic acid, carbapenems, tetracyclines quionolones.

>drainage of pus-the procedure is known as decompression

>immobilization of the limb by splinting

**Complications**

General complications include;>septicemia blood poisoning

>amyloidosis

Local commplications include;>pathologicak#

>COM

> deformity

**Chronic osteomylelitis**

When the infxn is established in the bon it results in chronic osteomyelitis

**Clinical features**

>Bony thickening

>Bony irregularity

>Bony tenderness

>Persistent discharging of sinus fixed to the bone

**Investigations**

Xray investigations and the radiological features include;

>Bony irregularity

>Increased bone density

>Ptrsence of cavities

>Presence of sequestrum

>Presence of involcrum

**Treatment**

>Adequate and specific long term antibiotic coverage

>Sequestrectomy and saucerization

>Continuous irrigation and suction system may be employed.