



BRUCELLOSIS

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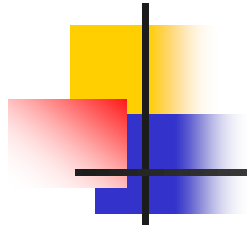
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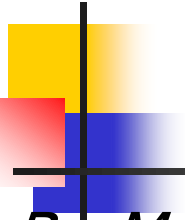
BRUCELLOSIS

Epidemiology

- Disease of domestic animals – Sheep, Goats, Cattle and Pigs.
- In Kenya, it is a problem in Farming and Cattle areas.
- *Brucella* → gram negative organism, Zoonosis.
- ***Br. Melitensis*** → young goat 1st Pregnancy; most common
- ***Br. Abortus*** → Pregnant cows, organisms lodge in uterus-abortion.
- ***Br. Suis*** → All species can infect pigs.
- Canine brucellosis can be acquired from dogs.



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- Humans acquire infection from infected domestic animals.
 - Ingestion
 - Inhalation
 - Direct or Indirect Contact
 - Ocular route



- *Br. Melitensis* → viable in fresh and salt water for up to 37 days; and in soil for 40 – 70 days. Processing ice cream and cheese does not destroy *Br. Melitensis*.

- *Br. abortus* → can survive in butter for up to 140 days. Prolonged refrigeration of ice cream does not kill *Brucella abortus*.

- *Br. suis* → refrigeration of carcasses up to 21 days still +ve.

- Inter-human transmission is rare only via blood transfusion or urine (Rare).



TRANSMISSION BY INGESTION

- *Br. Melitensis* → Milk, cheese, contaminated food or drinking water Also; dust, fecal material or products of conception.
- Direct contact imp. In *Br. Suis*.
- Farmers and Meat Packing employees (Abrasions) Ocular → Occasionally lab Workers.



AGE & SEX DIST.

- Disease of adult males – (occupation).
- Children more resistant. Although infection rate may be high in children mortality and morbidity is low.
- Occupational hazard – farmers, Vet. Surg., meat handlers, lab workers.



IMMUNOLOGY

- Some Immunity after Infection. The most important is the CMI.
- 2nd attacks known to occur.
- Antibodies are present in high amounts by the end of 2nd week. Humoral Immunity is therefore important.
- Primary response is increased IgM (acute infection) followed by secondary response with increased IgG and IgA.
- Cellular Immunity is well marked with **positive Brucellin**, skin reaction → Responsible for Pathological changes in liver, Spleen, Lymph glands and B. Marrow.



PATHOLOGY

- Organisms → intracellular.
- *Brucella* enter body-localized in regional lymph glands → Proliferation and Necrosis.
- Bacteria invade the blood stream and are carried in Leucocytes → RE tissue, Liver, Spleen, Lymph glands and B. Marrow.
- They localize in Mononuclear cells.
- The basic tissue response consists of monocytes and large phagocytes which form granulomas specially in liver, spleen, marrow and lymph glands → Metastatic abscesses in the bones.



CLINICAL FEATURES

- Incubation **1-3 weeks**. Sometimes many months.
- Onset
 - Sudden, undulating (malignant)
 - Undulating
 - Insidious (Intermittent type)



SYMPTOMS

- Weakness. mesenteric adenitis; features of appendicitis, Arthritis
- Fatigue, Chills, Drenching Night Sweats, Anorexia, Weight loss, headache. ■ Nervousness Depression and Insomnia.
- Brucella Spondylitis – bone pains, backache ■ Abortion in pregnant women
- Abdominal pain due to hepatosplenomegaly,



SIGNS

- Very few → fever; Undulant type; Avg. Duration in untreated disease is 4 months but it may last 2yrs.
- Different types are:
 1. Ambulant → Asymptomatic, excrete *Br. Melitensis* in urine.
 2. Mild – lasts about fortnight, mistaken for typhoid.
 3. Malignant-hyperpyrexia, Toxemia, fatal.
 4. Intermittent - Hectic fever and Sweat? TB?

1. **NB:** Take a geographical history



CONT.

- Chronic type – Headache and Nuchal Rigidity.
- Splenomegaly – Tender.
- Lymphadenopathy – Cervical and Axillary, Soft, Tender.
- Hepatomegaly – Less frequent than splenomegaly
 - mostly the splenomegaly is not proportionate to the hepatomegaly
- Tenderness of spine or sacroiliac joint.



COURSE OF DISEASE

- Usually self limiting; minority → localized disease i.e. spondylitis, meningoencephalitis, cholecystitis, bone lesions, radiculoneuritis.
- Small No. – persistent headache, mental depression, nervousness, vasomotor dysfunction.
- *B. abortus* – Milder, short course.
- *B. melitensis* – prolonged pyrexia.
- *B. suis* – may be severe and fatal; suppurating complications more frequent.



COMPLICATIONS

- **Brucella spondylitis** → very painful; bone and disc involvement → Osteomyelitis; paraplegia may result
- **Suppuration of large joints.**
- **CVS → Endocarditis.**
- **Hypersplenism**
- **Genitourinary** – Orchitis, Epididymitis, chronic pyelonephritis, prostatitis
- **Neurobrucellosis** → meningomyelitis, diffuse progressive encephalitis often associated with optic, 6th and 7th nerve lesions may occur; transient episodes include aphasia, dysarthria, paralysis, tinnitus, deafness visual Disorders and epilepsy.
- Differential diagnosis → Typhoid, TB, Reticulosis, Kala azar.
- **Anemia** → unusual; WBC normal with relative lymphocytosis and abnormal lymphocytes.



DIAGNOSIS

- Isolation of Brucella → **Blood Culture** as early as 2nd day of fever.
- Isolation from **urine** is much more difficult.
- Isolation from tissue lymph glands, bone (more yielding) and lung.
- **Liver Biopsy**
- **Immuno diagnosis** – agglutinins after 2nd week. Persists for a long time. This is the most important test and it depends on where the patient comes from:
 - Cross reaction with tularemia and cholera.
 - Titer more than 1/100 suggest brucellosis most 1/160 - 1/320.
 - CFT- measure IgG Ab.
 - Radio-immuno assay-specific IgM, IgG and IgA.
- Do not interpret serology on its own, relate it to symptoms etc.
- Positive Brucellin test = exposure to brucellosis; this test is good for epidemiological studies.



TREATMENT

1. **Doxycycline 100 mg, BD (6 weeks) + Streptomycin 1g, OD (2-3 weeks), IM → Gold standard**
2. Rifampicin 600 - 900mg, OD (depending on size of the patient) + Doxycycline, 100 mg BD (6weeks).
 - Avoid using this regimen as the first one since in patients co-infected with TB; resistance may result.
3. Quinolones + Rifampicin for 6weeks
4. Steroids in acutely ill patients
 - Not for routine use.
5. Septrin can be used as a 3rd drug in treatment failure



PREVENTION

- Milk and milk products to be pasteurized.
- Meat packers – Gloves
- Farmers suitably dressed when handling products of conception.
- Animal vaccination.
- No suitable vaccine for humans



QUESTIONS

- **List differentials of Brucellosis:**
 - TB
 - Kala azar
 - Typhoid
 - Schistosomiasis
 - Relative leukocytosis
 - Features of Hypersplenism
 - E.g. pancytopenia
- **What laboratory tests can be done to diagnose Brucellosis?**
- **What is the pathology of Brucellosis?**
- **What areas of the bone are affected by brucellosis:**
 - Intervertebral disc
 - Sacroiliac joint
 - Large joints
- **What are the findings on FBC:**
 - Anemia
- **Which Brucella sp. Will give Neurobrucellosis:**
 - *Brucella suis*