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Brucellosis

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Introduction:

Brucellosis is a zoonotic infection caused by the bacteria, genus Brucella. The bacteria are transmitted from animals to humans by ingestion through infected food products, direct contact with an infected animal or inhalation of aerosols.

It's an old disease also known as Mediterranean fever, Malta fever, and undulant fever. Humans are accidental hosts, but it continues to be a major health concern worldwide and is the most common zoonotic infection.

Brucella organisms are small aerobic gram-negative intracellular coccobacilli, localised in the reproductive organs of host animals causing abortions and sterility. They are shed in large numbers in the animal's urine, milk, placental fluid and other fluids. 12 Species have been identified named primarily for the source animal. The following 4 have moderate to significant human pathogenicity

a. Brucella melitensis (from sheep highest pathogenicity)
b. Brucella suis (from pigs, high pathogenicity)
c. Brucella abortus (from cattle, moderate pathogenicity)
d. Brucella canis (from dogs – moderate pathogenicity)

Global burden of human brucellosis > 5,00,000 infections/year worldwide. They have decreased significantly on account of animal vaccination and milk pasteurization.

Interest in brucellosis has been increasing because of increasing international tourism and migration. In addition, potential use of Brucellosis as a biological weapon.

Pathophysiology:

Brucella has the unique ability to invade both phagocytic and non-phagocytic cells and has ways to avoid the immune system, thereby being a systemic disease, that can involve every organ system. It gains entry through breaks in skin, mucous membrane, conjunctiva, respiratory and gastrointestinal tracts.

Ingestion occurs by way of unpasteurized milk, percutaneous needle stick exposure, conjunctiva, and exposure through eye splash and inhalation.

Once in the bloodstream they quickly become intracellular pathogens - within polymorphonuclear cells (PMNs) and macrophages. In addition, they have low virulence, toxicity and pyrogenicity – thus poor inducers of inflammatory cytokines, and do not activate alternative complement systems.

Brucella is transported into the lymphatic system- and in kidneys, spleen, breast, joints – and any organ system – CNS, heart, genitourinary system, pulmonary and skin.

Clinical presentation:

History is most important, occupation, exposure Laboratory workers, those exposed to animals –herders, farmers, dairy workers, veterinarians, abattoir workers, meat workers.

Symptoms:

Fever -80-100% of cases

Intermittent -60% of cases

Undulant -60% of cases

Fever of unknown origin is a common diagnosis.

Constitutional symptoms

Anorexia, Asthenia, fatigue, weakness, weight loss-

Arthralgias: low back pain, spine–joint pain (50-80%)

Neuropsychiatric Symptoms: Headache, depression, fatigue

GI Symptoms - Dyspepsia/ pain abdomen (hepatic abscess)

Genitourinary - orchitis, UTI, glomerulonephritis

Neurologic symptoms - weakness, dizziness, cranial nerve dysfunction

Respiratory- dyspnea

Endocarditis

Physical findings- Hepatosplenomegaly

Right hypochondrial tenderness

Osteoarticular- swelling, tenderness over joints

Systemic- as above

D/D- Collagen vascular disease

Erythema nodosum

FUO

Malignancy

Rickettsial disease

Sacroiliitis

Tuberculosis

Work-up

CBC, ESR, LFT

Culture- blood, bone marrow

Serology- Tube agglutination, IgG titre > 1:80, TAT

ELISA

PCR

Other- Chest Xray, USG Abdomen.

Treatment

Doxycycline 100 mg BD x 6 weeks

Gentamicin

Streptomycin

Rifampin

Trimethoprim- Sulfomethoxazole

Others- Fluroquinolones

WHO Recommendations

1. Doxycycline 100 mg BD + Rifampin 600-900mg OD x 6 weeks
2. Doxycycline 100 mg BD x 6 weeks + Streptomycin 1g/day I.M x 2-3 weeks or gentamicin
3. Ciprofloxacin-based regimen 500 mg BD

Children less than 8 years- Rifampin + TMP-SMX x 6 weeks

Pregnancy- challenging problem- TMP-SMX + Rifampin

Those with sacroiliitis / spondylitis- Doxy + Rifampin + Gentamicin x 2-3 weeks followed by Rifampin + Doxy x 6 weeks

Case Report

A 60-year-old lady with no known co-morbid conditions was admitted to GKNM Hospital in February 2018 with complaints of fever of 1-2 months duration. Fever was high grade, intermittent with chills. Relieved with analgesics. Also complained of significant neck and back pain for 1-month duration. She gave a history of significant weight loss of >10 kg.

No cough, dyspnea, chest pain, bowel or urinary complaints. No history of Jaundice. She was a goatherd by occupation, having around 20 goats.

On Examination

Average built, Afebrile, pallor positive, BP-110/80. No icterus, lymphadenopathy, no

overt joint swelling. Mild neck stiffness, no neurological deficits.

P/A- Liver just palpable, Other systemic examination NAD.

Investigations

CBC- Hb: 11gm, WBC: 6,200/cumm, N69, L26, Platelets: 2.4 lakhs, ESR 36

Smear MP negative (two samples), RBS, LFT, RFT Normal

ECG: sinus rhythm Normal. Blood culture (two samples): no growth.

X-ray of the cervical spine: fused cervical vertebrae. Brucella Agglutination- **1:320 positive**. A diagnosis of brucellosis was made based on the agglutination test report and her occupation. She was treated with Doxycyclin and Rifampicin along with supportives.

She showed a remarkable response, becoming afebrile within a week. She was discharged with tablet Doxycyclin 100 mg BD and Capsule Rifampicin 600 mg OD along with vitamins. She came for review after 1 month and was asymptomatic. She was advised to continue treatment but was lost to follow-up.

The case presented because of not being very common and the need to highlight occupation in the clinical history.

"Medicine is learned by the bedside and not in the classroom."

Sir William Osler.

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