

Brucellosis

د. فارس البكري

David Bruce

- British army physician and microbiologist (1855-1931)



Introduction

- Bruce first isolated *Brucella melitensis* in 1887
- Gram negative bacilli or coccobacilli
- Intracellular
- 12 species
- Pathogenic species:
 - *B. melitensis*
 - *B. suis*
 - *B. abortus*
 - *B. canis*



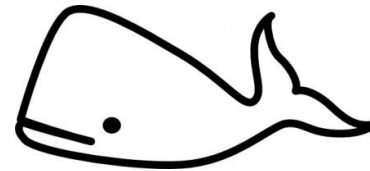
- *B. neotomae*: desert wood rats
- *B. ovis*: sheap

No human infections

- *B. pinipedialis*:
- *B. ceti*



Marine mammals , sporadic in humans



- *B. microti*: wild life

- *B. inopinata*: one case of breast implant wound

Brucella - Gram stain

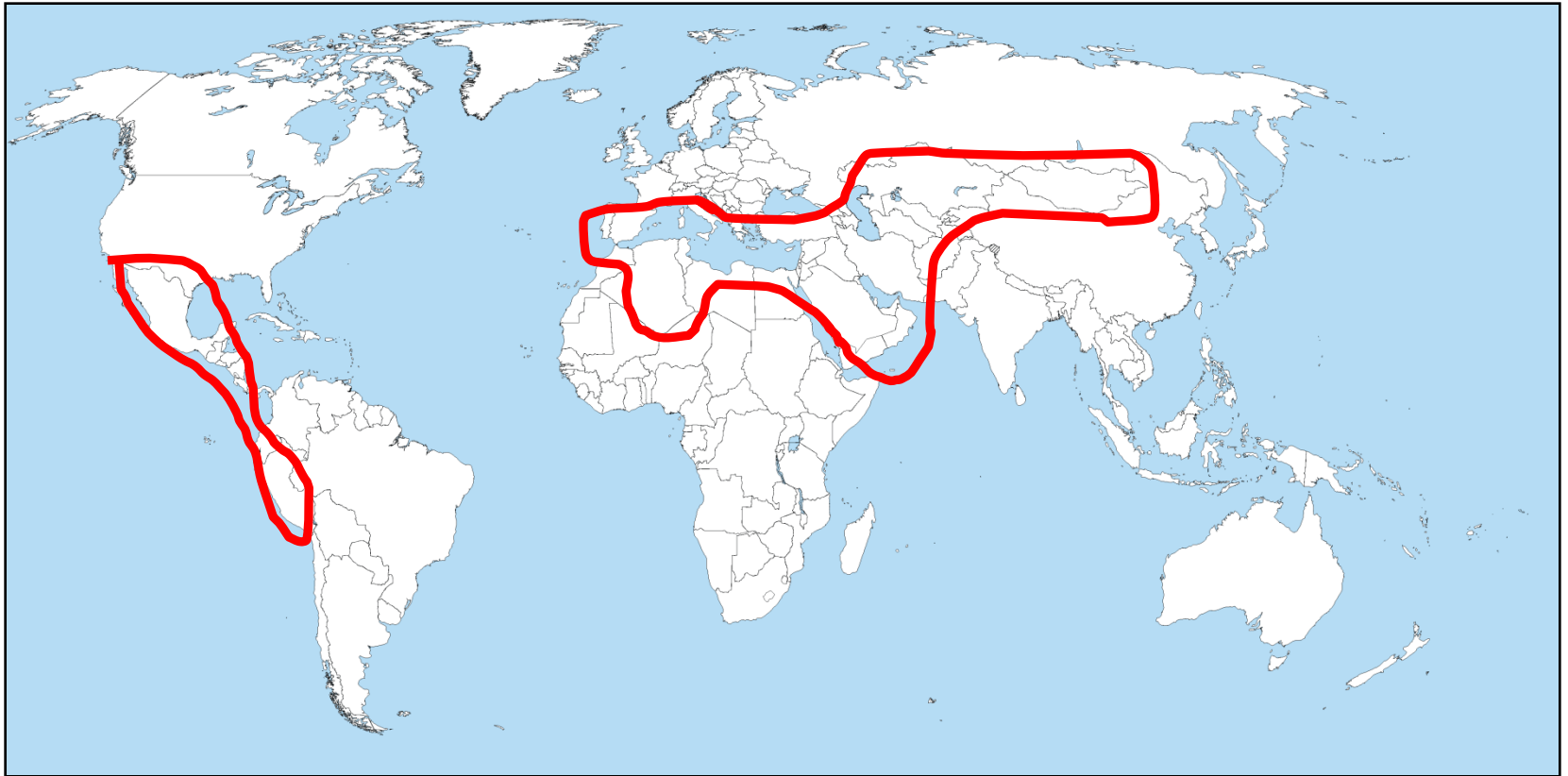
cocco bacilli or bacilli



Brucellosis in animals

- Asymptomatic
- Abortions
- Brucella is shed in large numbers in the animal's
 - Urine
 - Milk
 - Placental fluid

Brucella - epidemiology

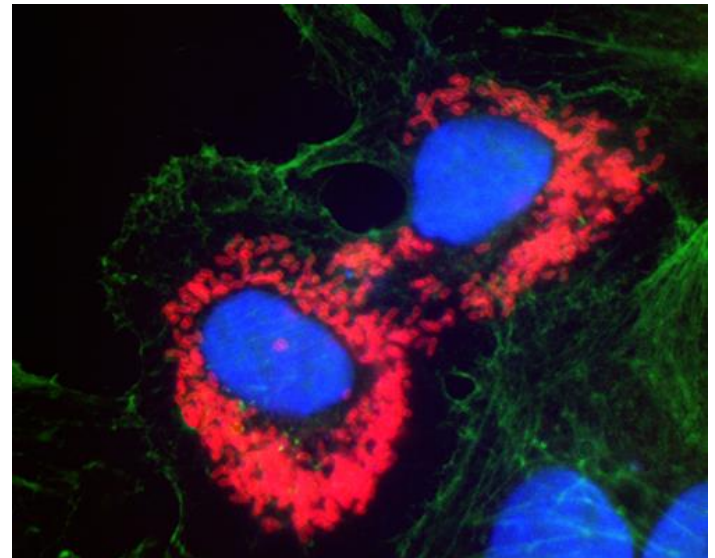


Types

- *B. melitensis*
 - the most virulent and causes the most severe and acute cases
 - the most prevalent worldwide
- *B. suis*
 - A prolonged course of illness, often associated with suppurative destructive lesions
- The type of *Brucella* species involved does not alter treatment.

Pathophysiology

- Only 100 to 1000 organisms are sufficient to cause infection.
- *Brucella* species have a unique ability of invading phagocytic cells



Pathophysiology

- Low mortality rate (<5%)
 - Mostly due to endocarditis, a rare complication
 - However, brucellosis can cause chronic debilitating illness with extensive morbidity
- More common in males
 - ratio of 5:2 in endemic areas

Modes of transmission

- **Ingestion** of unpasteurized dairy products is the main route of *B melitensis* transmission to humans
- Slaughterhouse workers
- Veterinarians are infected by inoculation of animal vaccines against *B abortus* and *B melitensis*
- Laboratory workers (microbiologists) are exposed by processing specimens (aerosols) without special precautions

- Macrophages then transport Brucella to the
 - lymph nodes
 - Spleen
 - Liver
 - bone marrow
 - mammary glands
 - sex organs

البر. الخنزيرية



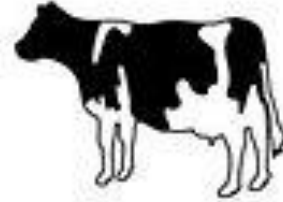
الخنزير

البر. الماطية



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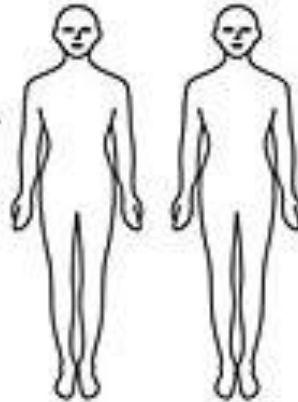
البر. المجهضة



البقر

الخمج البشري

العدوى بتناول الحليب
والجين الملوثين دون التماس
مع الحيوان المخبوج.



العدوى عن طريق التماس
المباشر مع الحيوان المخبوج،
ويتعرض لها المزارعون
والبيطريون وعمال المسالخ.

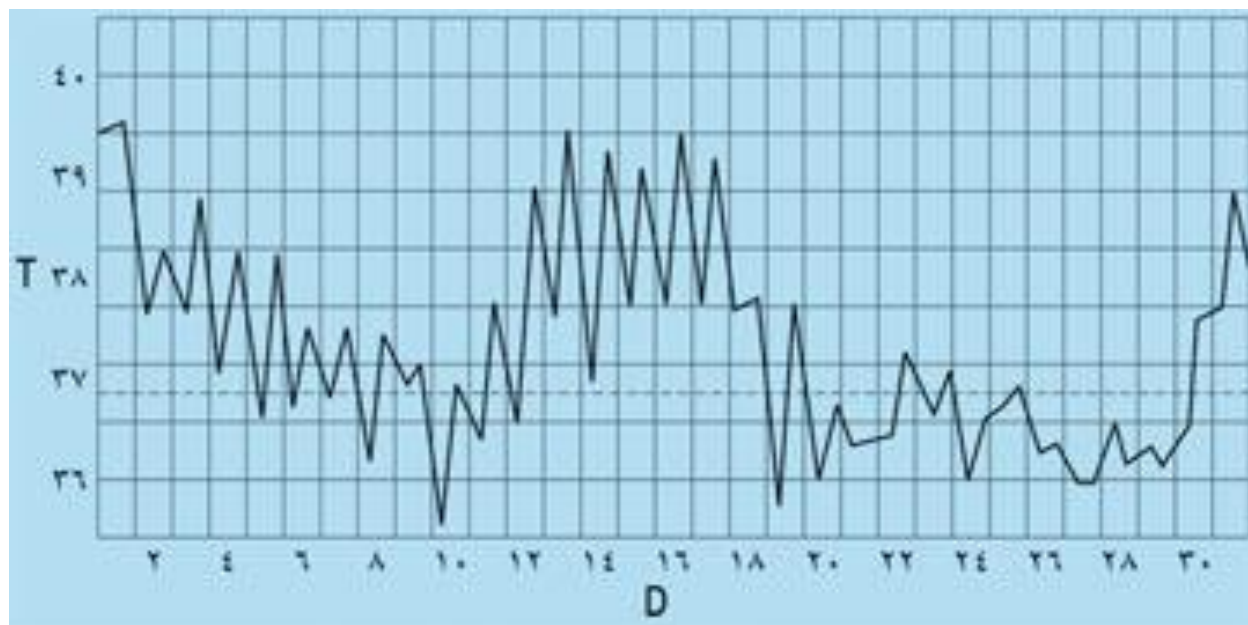


الشكل (١) انتقال داء البروسيالات

لا تنتقل من إنسان لآخر

Signs and symptoms

- Fever is the most common symptom and sign
 - 80-100% of cases
- Fever can be associated with a relative bradycardia
- Anorexia, asthenia, fatigue, weakness, and malaise and are very common (>90% of cases)
- abdominal pain, constipation, diarrhea, and vomiting
- Cough and SOB
 - Dry cough
 - 20% of cases
 - these symptoms are rarely associated with active pulmonary involvement



مخطط الحرارة في داء البروسيلات،

يبدي حمى «متموجة» نمطية،

وهي متكررة ومتغيرة في شكلها

الشكل (٢)

Presentation

- **Subclinical brucellosis:**
 - asymptomatic, and the diagnosis is incidental after serologic screening of persons at high risk of exposure
 - Culture is usually unrevealing
- **Acute or subacute brucellosis:**
 - mild and self-limited (eg, *B abortus*)
 - fulminant with severe complications (eg, *B melitensis*)
 - symptoms can develop at 2-12 months prior to diagnosis

Presentation

- **Chronic brucellosis:**
 - The diagnosis is typically made after symptoms have persisted for 1 year or more
 - Low-grade fevers and neuropsychiatric symptoms predominate
 - Results of serologic studies and cultures are often negative; without confirmatory evidence, many authorities doubt the existence of chronic disease
 - Many patients have persistent disease caused by inadequate initial therapy, and underlying localized disease may be present

Presentation

- **Localized complications**
 - In acute disease
 - In chronic untreated infection
 - Sites
 - osteoarticular
 - Genitourinary: epididymo-orchitis
 - Hepatosplenic
 - Endocarditis (very rare: 2%)
 - CNS

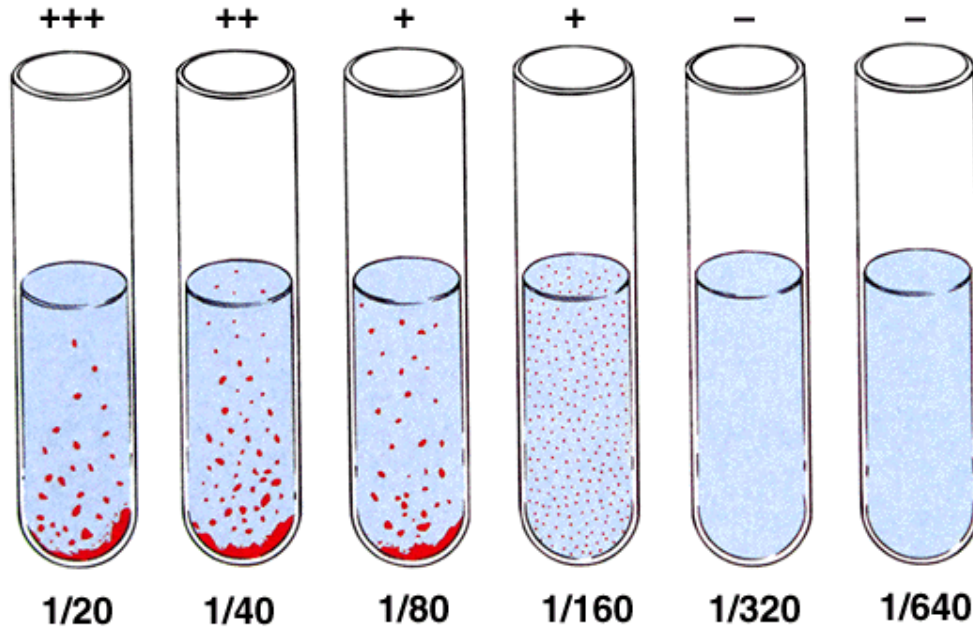
Presentation

- Osteoarticular
 - symptoms affect 20-60% of patients
 - the most commonly reported complications
 - sacroiliitis is the most common

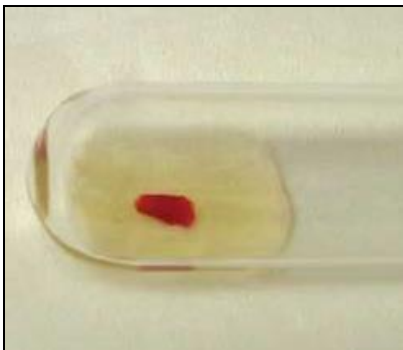
Diagnosis

- ↓ WBC
- relative lymphocytosis
- Pancytopenia
- Elevation in liver enzymes
- Culture
- Serology – titers
 - Standard tube agglutination
- PCR: not yet in clinical practice

Standard tube agglutination



Titer = 1/160



Reaction



No reaction

Treatment

- Multidrug regimens are the mainstay of therapy
 - because of high relapse rates reported with monotherapy
- Doxycycline and rifampin:
 - 6 weeks
- Doxycycline (6 weeks) + streptomycin (2-3 weeks)
 - more effective
- **Children** < 8 years
 - The use of rifampin + (TMP-SMX) for 6 weeks
- **Pregnant:**
 - Brucellosis treatment is a challenging problem
 - limited studies
 - rifampin alone or in combination with TMP-SMX

Doxycycline and teeth



شكرا