# BRUCELLOSIS

Marwan Shalabi, MD, FAAP.
Pediatric Infectious Diseases Consultant

# ETIOLOGY

- Brucella abortus (cattle)
- B. melitensis (goat/sheep)
- B. suis (swine)
- B. canis (dog)

- Aerobic, non–spore-forming, nonmotile, gram-negative coccobacillary bacteria
- Fastidious

# EPIDEMIOLOGY

- Rare in industrialized countries
- Prevalent in : in the Mediterranean basin, Arabian Gulf, Indian subcontinent, and parts of Mexico and Central and South America.
- Unpasteurized milk from goats or camels may be used to feed children, thus leading to the development of brucellosis.

# EPIDEMIOLOGY

- Routes of infection :
  - Cuts or abrasions
  - Conjunctiva
  - Inhalation of infectious aerosols
  - or most commonly ingestion of contaminated meat or dairy products.
- B. melitensis and B. suis tend to be more virulent than B. abortus or B. canis.
- Zoonitic

# Clinical Findings in Childhood Brucellosis from Selected Seriesa

| Symptoms (%) | Series I[18] (102 Cases) | Series II[19] (157 Cases) | Series III[21] (200 Cases) | Series IV[22] (48 Cases) | Series V[24] (52 Cases) |
|---|---|---|---|---|---|
| Fever | 91 | 80 | 70 | 88 | 88 |
| Chills | 20 | NR | NR | 75 | NR |
| Sweats | 19 | NR | 22 | 79 | 19 |
| Fatigue/malaise | 60 | 91 | 67 | 77 | 29 |
| Anorexia | 40 | 68 | NR | NR | NR |
| Weight loss | 48 | 68 | 67 | 56 | NR |
| Arthralgia | 73 | 25 | 74 | 32 | 62 |
| Headache | 11 | NR | NR | 47 | 21 |
| Backache | 16 | NR | NR | 73 | NR |
| Abdominal pain | 11 | 20 | 22 | 44 | 19 |
| Cough | NR | 20 | NR | 21 | 12 |
| Arthritis | 37 | NR | 30 | 11 | NR |
| Lymphadenopathy | 16 | 18 | NR | 67 | 23 |
| Splenomegaly | 35 | 55 | 23 | 38 | 52 |
| Hepatomegaly | 28 | 31 | 23 | 25 | 33 |

# CLINICAL MANIFESTATIONS

- nonspecific, beginning 2-4 wk after inoculation
  - classic triad of fever, arthralgia/arthritis, and hepatosplenomegaly
  - fever of unknown origin.
  - abdominal pain, headache, diarrhea, rash, night sweats, weakness/fatigue, vomiting, cough, and pharyngitis

# CLINICAL MANIFESTATIONS

- Invasive infections: Meningitis, Bacteremia and SA/Osteomyelitis
- Arthritis of the knees and hips in children and of the sacroiliac joint in adolescents and adults can be found.
- Neonatal and congenital infections with these organisms have also been described.

# DIAGNOSIS

- CBC:thrombocytopenia, neutropenia, anemia, or pancytopenia.
- history of exposure to animals or ingestion of unpasteurized dairy products may be more helpful.
- A definitive diagnosis is established by recovering the organisms:
  - **Blood Culture**. alert micro lab.
  - **Bone Marrow culture** : alert micro lab.
  - Bone marrow cultures may be superior to blood cultures

# DIAGNOSIS

- Serology
  - Used for diagnosis but NOT for follow up since it could persists even after recovery.
  - Serum agglutination test (SAT)
    - Measures total Ab ( IgM and IgG)
  - False-positive results due to cross-reacting antibodies to other gram-negative organisms:
    - Yersinia enterocolitica
    - Francisella tularensis
    - Vibrio cholerae

# RECOMMENDED THERAPY FOR THE TREATMENT OF BRUCELLOSIS

| | | |
|---|---|---|
| < 8 years: | Rifampicin + TMP/SMX | Add IV Gentamycin for hospitalized patient |
| > 8 years: | Rifampicin + Doxycycline | Add IV Gentamycin for hospitalized patient |

| Condition | Antimicrobial Agents | Dose | Route | Duration of Therapy |
|---|---|---|---|---|
| **Adults** | | | | |
| Acute brucellosis or relapse | Doxycycline | 200 mg/day | PO | 6 week |
| | *Plus* | | | |
| | Streptomycin | 1 g/day | IM | 2 week |
| | *Or* | | | |
| | Gentamicin | 3–5 mg/kg per day | IM or IV | 1 week |
| Alternative | Doxycycline | 200 mg/day | PO | 6 week |
| | *Plus* | | | |
| | Rifampin | 15–20 mg/kg per day | PO | 6 weeks |
| **Children** | | | | |
| > 8 years | Same as adults | | | |
| < 8 years | TMP-SMX[a] | 2 DS tablets/day | PO | 45 days |
| | *Plus* | | | |
| | Rifampin | 15–20 mg/kg per day | PO | 45 days |
| **Complications**[b] | | | | |
| Meningitis | Doxycycline | 200 mg/day | PO | 4–6 months |
| | *Plus* | | | |
| | Rifampin; | 900 mg/day | PO | 4–6 months |
| | *Or* | | | |
| | TMP-SMX[a] | 2 DS tablets/day | PO | 4–6 months |
| | *Plus* | | | |
| | Rifampin | 900 mg/day | PO | 4–6 months |
| Endocarditis | Same as meningitis[c] | | | |

DS, double-strength; IM, intramuscular; IV, intravenous; PO, by mouth; TMP-SMX, trimethoprim-sulfamethoxazole.
[a]TMP-SMX standard formulation (80 mg trimethoprim/400 mg sulfamethoxazole) is given as four standard tablets or two double-strength tablets per day.
[b]See text.
[c]Valve replacement surgery may be necessary.


Thank
You