Brucellosis
(Malta Fever)

Dr. Nadhim Ghazal

- It’s a primary venereal zoonotic disease transmitted accidentally to human, although the sexual life in animals is transient and in spite of the venereal mode of transmission, other modes are possible.
- The disease was endemic in Malta as a common illness among the British army members over there. So it was named as Malta fever, Mediterranean fever, undulating fever or brucellosis.

- In 1887 a British surgeon “David Bruce” discovered the causative agent. Twenty years later a Maltish physician “Zamit” discovered the role of milk in the mode of transmission. The causative agent is small, rod shaped, G-ve, non spore forming, non motile bacillus which need specific media for culture (blood agar with high CO2 tension ≈ 15 %).
- It’s exclusively intracellular, and the bacilli are of 4 species (all of them are partially species specific adapted):

1. ***Brucella abortus***: the most common one, present all over the world with different incidence. The reservoir is cattle.
2. ***Brucella melitensis***: the most virulent species and causes the most fatal manifestations and complications. The reservoir is sheep.
3. ***Brucella suis***: the reservoir is pig.
4. ***Brucella canis***: the reservoir is canine animals.

Epidemiology

1- Geographical distribution:

The disease is worldwide distributed, but more prevalent in developing countries, especially those depending on agriculture and animals.

a) *Br. Abortus*: in USA (affecting only the high risk groups), therefore it's limited to the factories of meat and milk production.

b) *Br. Melitensis*: in Mediterranean region especially Iraq & Saudi Arabia.

c) *Br. Suis*: in Europe, Japan, USA and Australia. i.e. in regions of high pigs consumption.

d) *Br. Canis*: in USA with very few cases in Iraq.

2- Age distribution:

- Affect all age groups even lactating infants, but usually affect the highly productive age group (18-45) years old.

3- Sex distribution:

- Males carry higher risk due to occupation.
- Note: a study in Diyala province showed that women are more affected by this disease than men in the province area due to handling animals.

4- Occupation:

- The disease affect cowboys, animal house keepers, meat factory workers, milk & dairy product workers, Lab workers, vaccine workers, butchers, leather workers and veterinarians.

- **Mode of Transmission:**

1. **Animal to animal**: via ingestion of infected secretions, inhalation, sexually, abrasions on conjunctiva & inoculation.
2. **Animal to human**: either direct via skin or mucous membrane of the eye. Or indirect via inhalation, ingestion of meat, milk & its products.
3. **Human to human**: not present, but only in two very rare occasions, these are blood transfusion & lactation.

- **Pathogenesis:**
- The agent enters the body via skin or mucous membrane, then goes by blood stream to regional lymph nodes (auxiliary, cervical or inguinal) then back to blood.
- **Incubation Period:**
- 10-20 days and may reach 3 months.

- **Clinical Features:**

1- Acute phase (15 %):

- The patient may have fever, chills, abdominal pain, backache, nausea, vomiting, malaise, generalized weakness; joint pain (as in septic arthritis) especially large joints e.g. hip & sacroiliac joints.

2- Chronic phase (85 %):

- The patient may have ill general health, malaise, loss of interest in vital processes (sex, eating etc …), neurological manifestations, regional lymph node enlargement and hepatosplenomegally (which may occur even in the acute phase), sometimes depression is the only symptom.

- **Diagnosis:**
- This depend on the clinical features and the lab investigations

1. **Isolation of the pathogen**: it's difficult and need 4 weeks, it give positive results in 25% of acute and 95% of chronic cases.
2. **Agglutination (Rose-Bengal) test**: which should contain all the species, It's a cheap, sensitive, but not highly specific. So we do No. 3.
3. **Confirmative test**: This should be highly specific and sensitive.
4. **IFAT "Indirect Fluorescent Antibody Test"**: this is highly specific and highly sensitive but more expensive.

Complications:

1. Septic arthritis.
2. Cholecystitis.
3. Meningeoencephalitis.
4. Empyema (pus in lung).
5. Sub phrenic abscess.
6. Pericarditis & myocarditis.
7. Pneumonia.
8. Nephritis.
9. Vestibulocochlear envolvement.

- **Pathogen:**
- The pathogen can survive outside the human being and can be killed at 65 C˚ for 30 minutes, 100 C˚ for 5 minutes, 137 C˚ for 1-3 seconds (super pasteurization of milk). It loses its virulence as long as it’s refrigerated, and can survive in refrigeration for months.

- **Preventive Measures:**

1- Animal level:

a) Vaccination of new generation by live attenuated vaccine, this will lead to decrease the human cases (i.e. human cases are positively correlated to animal cases).

b) Examination of animals before slaughtering.

c) Burning of dead animals or digging them due to economic reasons (they produce no milk, no meat, no wools and provide no reproduction i.e. they provide economic losses) so they must be removed by burning.

d) Examination, prohibition and supervision of meat butchers houses.

2- Human level:

a) Pasteurization of milk and its products.

b) Proper meat cooking.

c) Prohibition of milk and diary.

d) Health education for high risk groups.

e) Wearing protective clothes e.g. gloves, masks, long boots and eye glasses.

END