BRUCELLOSIS

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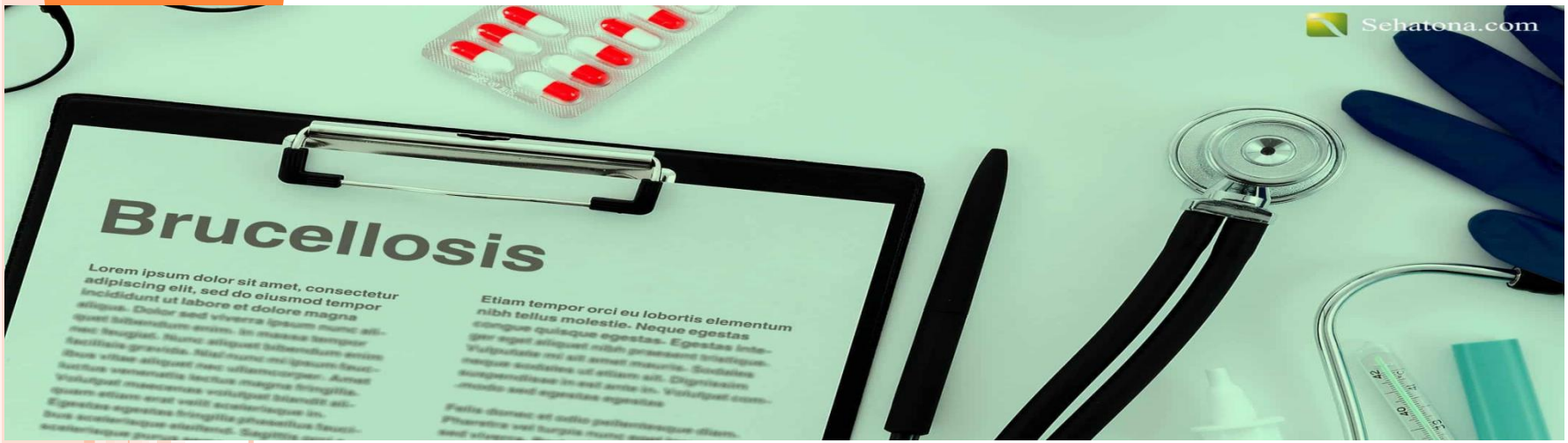

IDENTIFICATION

Brucellosis is a bacterial disease caused by small, gram negative rod shaped, non motile, non sporing and intracellar coccobacilli of genus Brucella.

It is a zoonotic disease meaning that it is primarily an infection of animals but can be transmitted to human.

Different species of Brucella bacteria mostly infect domestic livestock including:

1. Cattle (*B. abortus*).
2. Sheep and goats (*B. melitensis*).
3. Pigs (*B.suis*).
4. Dogs which can also be infected with (*B. canis*).
5. Brucella ceti and Brucella pinnipedialis

Other names of brucellosis: (Undulant fever, Malta fever and Mediterranean fever).

GEOGRAPHICAL DISTRIBUTION

It is a worldwide infection traditionally associated with farm workers, veterinarians and persons whose occupation includes packing of meat or dairy products.

It affects people of all age groups and of both sexes. Although there has been great progress in controlling the disease in many countries, there still remain regions where the infection persists in domestic animals and transmission to the human population frequently occurs.

GEOGRAPHICAL DISTRIBUTION

It is an important human disease in many parts of the world especially in the Mediterranean countries of Europe, Africa, the Middle East, south and central Asia and central and south America and Mexico and yet it is often there are only a few countries in the world that are officially free of the disease although cases still occur in people returning from endemic countries. Significant proportion of brucellosis cases still remain undiagnosed.

The disease is now rare in most European countries, North America and Australia.

Clinical Manifestation

Fever, Night sweats, Malaise, Anorexia, Arthralgia, Fatigue, weight loss and depression. Subclinical has been reported.

Bone and joint involvement are the most frequent complications of brucellosis occurring in up to 20-60% of cases.

Different syndromes have been reported including sacroiliitis, spondylitis, peripheral arthritis, osteomyelitis, bursitis and tenosynovitis.

Brucella sacro-iliitis is especially common. Patients present with fever and back pain often radiating down the legs (sciatica).

Genito urinary involvement occur in 2% to 20% of cases with orchitis and epididymitis as a common manifestations

Neuro-brucellosis is less common but more severe (represent 3-7%). Recovery is usual but disability is often pronounced.

Case fatality rate in untreated cases represent 2% or less usually from endocarditis. In brucellosis relapse can occur.

Mode of transmission

Brucellosis is a zoonotic disease transmitted to humans by:

1. Contact through mucus membranes and breaks in the skin with fluids from infected animals (including sheep, cattle, goats, pigs, or other animals) these fluids include blood, urine, vaginal discharges and aborted fetuses and especially placentas.

2. Ingestion of raw milk and dairy products such as unpasteurized milk and cheese and ingestion of undercooked meat from infected animals.

3. Airborne transmission has been reported in laboratory and slaughterhouse workers.

4. Accidenital self inoculation of strain 19, REV-1 and RB 51 brucella animal vaccines.

5. Person to person transmission is rare, possible sexual transmission and breast feeding women may transmit infection to their infants.

Table 3. Survival periods of *B. abortus* or *B. melitensis* in various substrates.

Medium	Temperature or environment	Survival
B. abortus		
Solid surfaces	<31 °C, sunlight	4–5 hours
Tap water	–4 °C	114 days
Lake water	37 °C, pH 7.5	<1 day
Lake water	8 °C, pH 6.5	>57 days
Soil – dried	~20 °C	<4 days
Soil – wet	<10 °C	66 days
Manure	summer	1 day
Manure	winter	53 days
Farm slurry animal waste	ambient-temperature tank	7 weeks
Farm slurry animal waste	12 °C tank	>8 months
B. melitensis		
Broth	pH>5.5	>4 weeks
Broth	pH 5	<3 weeks
Broth	pH 4	1 day
Broth	pH <4	<1 day
Soft cheese	37 °C	48–72 hours
Yoghurt	37 °C	48–72 hours
Milk	37 °C	7–24 hours

Brucellosis

Reservoir

Cattle, swine, goats and sheep. Dog is regard a reservoir for B. canis.

Incubation period

Commonly 1-2 months with range of 5 days to 5 months

Period of communicability

Rare person to person transmission but risk may exist for medical personnel in endemic area expose to contaminated fomities, tissues or massive bleeding such as obstetric procedures.

BRUCELLOSIS

Susceptibility

Severity and duration of clinical illness vary. Duration of acquired immunity is uncertain.

Diagnosis by the following:

1.Isolation of the infectious agent from blood, bone marrow or other tissues or discharges.

2. PCR.

3. Serological tests which allow precise diagnosis in about 95% of cases (including combination of Rose Bengal and seroaglutination test with coombs-test and ELISA- test).

METHODS OF CONTROL

The most effective method for preventing human brucellosis is control and eradication of infections in animal reservoirs.

a. Preventive measures :

1.Educate the public especially the tourists about the risks associated with drinking unpasteurized milk or eating products made from unpasteurized milk.

2.Educate farmers and workers in slaughter houses and butcher shops about the nature of disease and risk of handling carcasses and product from infected animals and importance of appropriate ventilation.

3.Educate hunters to use protective gloves and clothing when handling feral swine or potentially infected wildlife such as elk.

METHODS OF CONTROL

4. Search for infection among livestock by serological testing and by ELISA or ring test and eliminate infected animals by segregation and or slaughtering.

In high prevalence area immunize young goats and sheep with live attenuated Rev-1 strain of B. melitensis and immunize calves and adult animals with strain 19 (B. abortus) vaccine.

Since 1996 the strain RB51 of B. abortus has replaced strain 19 for immunization of cattle against B. abortus. RB51 vaccine was designed to be less virulent for humans than strain 19 when accidentally injected.

METHODS OF CONTROL

5. Pasteurize milk and dairy products from cows, sheep and goats. Boiling milk is applied when pasteurization is impossible. Don’t eat meat from animals that appear ill.

6. Exercise care in handling and disposal of placenta and discharges and fetuses and disinfect contaminated areas.

Methods of control

b. Control of patient , contacts and immediate environment

1. Report to local health authority.
2. Isolation: draining and secretion precautions applied if there are draining lesions, otherwise none.
3. Concurrent disinfection of purulent discharges.
4. Investigation of contacts and source of infection: Trace infection to the common or individual source usually infected domestic goats, swine and cattle or raw milk or dairy products from cows and goats. Test for suspected animals and remove reactors.
5. Specific treatment: The treatment of choice is a combination of doxycycline (200 mg daily) and rifampicin (600-900 mg daily) or streptomycin (1g daily).

KEY POINTS ON TREATMENT OF BRUCELLOSIS IN HUMANS

- The essential element in the treatment of all forms of human brucellosis is the administration of effective antibiotics for an adequate length of time.
- Treatment of uncomplicated cases in adults and children eight years of age and older: doxycycline 100 mg twice a day for six weeks + streptomycin 1 g daily for two to three weeks.

OR

- Doxycycline 100 mg twice a day for six weeks + rifampicin 600–900 mg daily for six weeks.

KEY POINTS ON PREVENTION OF BRUCELLOSIS IN HUMANS

- The prevention of human brucellosis is based on occupational hygiene and food hygiene.
- Vaccination is not generally recommended.
- All dairy products should be prepared from heat-treated milk.
- Consumption of raw milk or products made from raw milk should be avoided.
- Meat should be adequately cooked.
- Special precautions should be taken by laboratory workers.
- Physicians and health workers should be aware of the possibility of brucellosis.
- Public health education should emphasize food hygiene and occupational hygiene.

KEY POINTS ON PREVENTION, CONTROL AND ERADICATION OF ANIMAL BRUCELLOSIS

- Animal brucellosis is best prevented by careful herd management and hygiene.
- Vaccination is useful for prevention and control of infection.
- *B. abortus* strains 19 and RB 51 are recommended for prevention of bovine brucellosis.
- *B. melitensis* Rev 1 is recommended for prevention of *B. melitensis* infection in sheep and goats.
- Vaccine efficacy may be limited in the face of heavy exposure.
- Control and prevention schemes require effective collaboration between all sections of the community.
- Control programmes must be properly planned, coordinated and resourced.
- Education and information programmes are essential to ensure cooperation at all levels in the community.
- Eradication can only be achieved by test-and slaughter combined with effective prevention measures and control of animal movements.

Epidemic and international measures

Epidemic measures

Search for common vehicle of infection usually raw milk or milk products especially cheese from infected herd.

Stop production and distribution of product unless pasteurization is instituted.

International measures:

Control of domestic animals and animal products in international trade and transport.

KEY POINTS ON SURVEILLANCE BRUCELLOSIS IN HUMANS AND IN ANIMALS

- Continued surveillance is essential to monitor the presence/absence of brucellosis and the efficacy of control programmes.
- The key to effective surveillance is the case definition, reporting, analysis of data and dissemination of information for action.
- The surveillance programme must be designed according to the adopted control strategy.
- Human cases may be the first indication of infection in the animal population.