

MEDICINE

61 Common Endemic Infections in Saudi Arabia



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COLOR GUIDE: • Females' Notes • Males' Notes • Important • Additional

NO Objectives

Typhoid fever

Typhoid and paratyphoid fevers, which are transmitted by the faecal–oral route, are important causes of fever in India, sub-Saharan Africa and Latin America. Elsewhere, they are relatively rare. Enteric fevers are caused by infection with *Salmonella typhi* and *S. paratyphi* A and B. (Davidson's)

In General:

- It is an acute febrile disease, caused by *Salmonella typhi* and *S. paratyphi* A, B,C
- *S. typhi* and *paratyphi* lives only in humans.
- Persons with typhoid fever carry the bacteria in their bloodstream and intestinal tract.
- Carriers recovering from typhoid fever shed *S. Typhi* in their feces.
- It is transmitted through the ingestion of food or drink contaminated by infected people.

From doctor note:

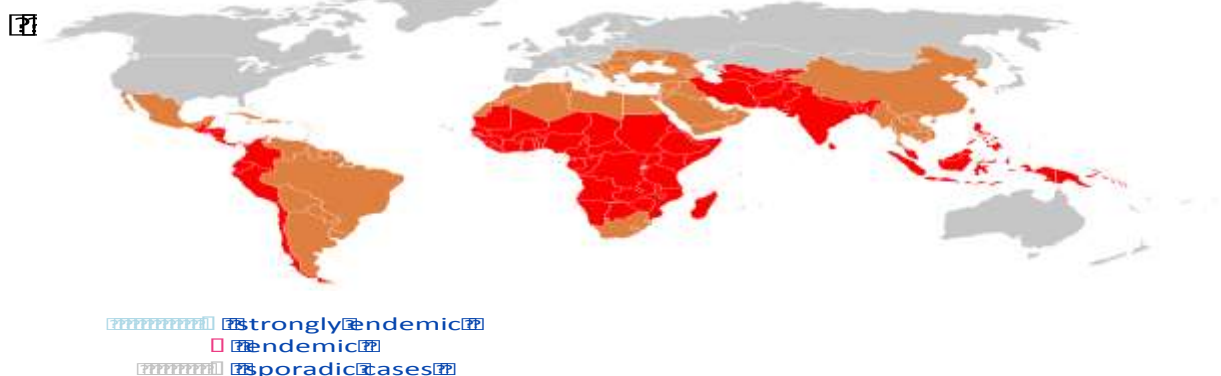
Fever without focal symptoms.

Now we start to see it from non-travelers

Salmonella enteritidis has more than 1200 serotypes.

When patient recovers, it still in patient's body (carrier): this is the source to infect others.

Epidemiology



Pathogenesis of Enteric fever:

- The organisms penetrate ileal mucosa
- Reach mesenteric lymph nodes - multiply there.
- Invade Blood stream
- Infect Liver, Gall Bladder,, spleen, Kidney, Bone marrow.
- After 7-10 days bacilli pass into blood strea (secondary bacteremia)

When bacteria reach blood, fever starts and patient comes to clinic. (In secondary bacteremia)

Pathogenesis: After a few days of bacteraemia, the bacilli localise, mainly in the lymphoid tissue of the small intestine, resulting in typical lesions in the Peyer's patches and follicles. These swell at first, then ulcerate and usually heal. After clinical recovery, about 5% of patients become chronic carriers (i.e. continue to excrete the bacteria after 1 year); the bacilli may live in the gallbladder for months or years and pass intermittently in the stool and, less commonly, in the urine. (Davidson's)

Clinical features

- Develop 1- 3 weeks after exposure.(This is the incubation period)
- May be mild or severe. Gradual onset
 - Intermittent fever
 - Malaise, headache
 - Abdominal pain
 - Constipation or Diarrhoea (depending on the stage of the illness)
 - Rose-colored spots on the chest Rose
 - Enlarged spleen or liver.
- Healthy carrier state may be follow acute illness.

Rose spots: 2 -4 mm in diameter raised discrete irregular blanching pink maculae's found in front of chest

Appear in crops of upto a dozen at a time

Fade after 3 – 4 days

They are erythematous when you press on them, they blanch on pressure



Complications:

- Pneumonia, meningitis, osteomyelitis
- Severe intestinal hemorrhage and intestinal perforation
- If not treated can be fatal.

Carriers:

5% of the survivors continue to excrete the organism for months = carriers.
In carriers the bacteria remain in the gall bladder and are shed into the intestine.

(Note: Found positive in stool culture)

Investigations:

- WBC (usually normal. In fact, neutropenia)
- ESR (elevated)
- Blood, bone marrow, or stool cultures {gold standard (blood culture)}
- Widal test (serum agglutination test)
- Cross reactions- false positives

Blood Cultures in Typhoid Fevers:

- Bacteremia occurs early in the disease
- Blood Cultures are positive in

1st week in 90%

2nd week in 75%

3rd week in 60%

4th week and later in 25%

Positivity decline with time

From doctor note:

If stool culture is +ve and there is symptoms (fever) = typhoid fever is the diagnosis.

If stool culture is +ve and there is no symptoms (fever) = carrier



Treatment:

- 3rd generation cephalosporins, like Ceftriaxone are effective
- Flouroquinolones, like ciprofloxacin are the drugs of choice for treatment of typhoid fever.
- Fever may continue for several days after starting therapy. **Doesn't mean treatment isn't effective, you need to continue**
- The majority are cured with antibiotics 10% may relapse.

Prevention and Control (WHO, 2009) Control measures:

- Health education **proper sanitation**
- Antibiotic treatment **reduces who carry the organism for prolonged period.**
- Excluding disease carriers from food handling.
- A vaccine is available recommended for travellers to high risk areas. It does not provide full protection **Vaccine's effective is 50%**

Improved sanitation and living conditions reduce the incidence of typhoid. Travellers to countries where enteric infections are endemic should be inoculated with one of the three available typhoid vaccines (two inactivated injectable and one oral live attenuated). (Davidson's)

Brucellosis

Brucellosis is an enzootic infection (i.e. endemic in animals). Although six species of *Brucella* Gram-negative bacilli are known, only four are important to humans: *B. melitensis* (goats, sheep and camels in Europe, especially the Mediterranean basin, the Middle East, Africa, India, Central Asia and South America), *B. abortus* (cattle, mainly in Africa, Asia and South America), *B. suis* (pigs in South Asia) and *B. canis* (dogs). *B. melitensis* causes the most severe disease; *B. suis* is often associated with abscess formation. **(Davidson's)**

In general:

- Other names: (called multia-fever and undulant fever (المالطية الحمى))
- Systemic febrile illness
- Zoonosis.. Occurs worldwide. (Acquired from animals)
- B. melitensis and B. abortus are most frequent.
- The incubation period 1 - 4 weeks. (little longer than typhoid)

Transmission:

Infection transmitted to humans by:

- acontact with fluids or meat from infected animals (sheep, cattle, goats, pigs, or other animals)
- Eating food products such as unpasteurized milk and cheese.
- The disease is rarely, if ever, transmitted between humans.

Veterinarians are at high risk especially when having contact with placenta.
Poachers are also at high risk especially after Aladha Eid because they have a cut wound and are in contact with animal's blood

Pathogenesis

- Enter the body
- To lymph nodes **get multiplied**
- To blood stream
- Reticuloendothelial System
- Blood
- Any organ **spleen, liver, bone, joint**

Clinical Manifestations:

Often fits one of the three patterns:

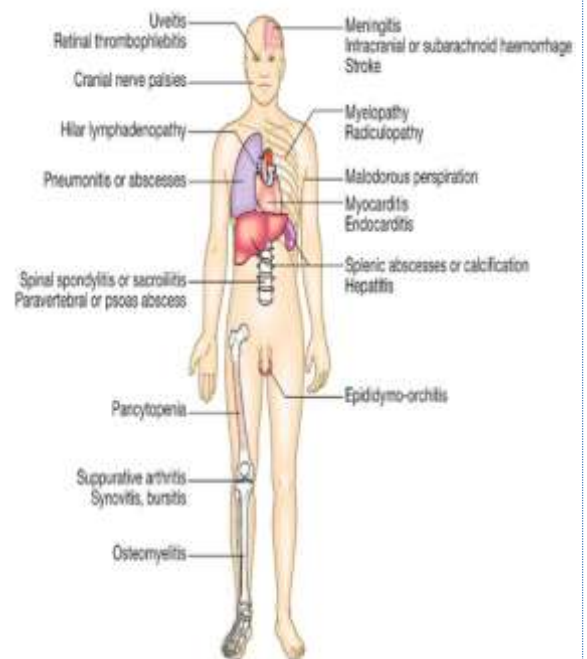
- Acute febrile illness resembling typhoid.
- Fever & acute monoarthritis (hip/knee)
- Low grade fever, low back pain, hip pain (**for prolonged period**)

- Symptoms:

- Fever, Night sweats, Fatigue
- Anorexia, Weight loss
- Arthralgia, Low back pain **common**
- Depression

- Signs:

- Arthritis **swollen, red, erythematous**
- Lymphadenopathy
- Hepatosplenomegaly



Localised Brucellosis **commonly localized in bone and joints especially sacroiliac joint**

- Osteoarticular disease: especially sacroileitis, vertebral spondylitis and large joints arthritis
- Genitourinary disease, especially epididymo-orchitis
- Neurobrucellosis, usually presenting as meningitis, radiculopathy. **Occasionally**
- Abscess involving the liver, spleen, abdomen. **Common Radiculopathy: pain in distribution of any long nerves**

Investigations:

- WBC
- ESR
- Blood cultures **slow to grow, have to mention brucella culture in order to keep it at least for 4 weeks.**

Slow growth = 4 weeks

- Serology: SAT positive in recent infection **you treat only with clinical symptoms**
- No diagnostic level...>1:360

Treatment

- Treatment for uncomplicated Brucellosis
 - Streptomycin + Doxycycline for 6 weeks **streptomycin has to be injected**
 - Rifampicin + Doxycycline for 6 weeks **most people**
 - ? TMP/SMX + Doxycycline for 6 weeks
- Treatment of complicated Brucellosis
 - Endocarditis, meningitis
 - No uniform agreement
 - Usually 3 antibrucella drugs for 3 months

For children and pregnant women, don't use doxycycline. Give cotrimoxazole and rifampicin

Relapse

- ✓ About 10 percent of patients relapse after therapy.
- ✓ Most relapses occur within three months following therapy and almost all occur within six months.
- ✓ Relapse should prompt assessment for a focal lesion, especially hepatosplenic abscess
- ✓ Most relapses can be treated successfully with a repeat course of a standard regimen.

(The same treatment)

Gastroenteritis

In general:

Main feature is diarrhea – **most likely infection** and Vomiting **is not a specific symptom**.

Not all gastroenteritis have fever.

Defence mechanisms

- Gastric acidity

- GI peristalsis
- Normal flora doesn't allow organisms to settle
- Immune defences in mucosa of GIT. Particularly, secretion of immunoglobulin A + lymphatic

Causes of gastroenteritis:

- Viruses → rotavirus = infect children = most important cause of infant mortality in the world = die from dehydration = hydrate to treat them

Not adult: because by age of two years 95% of children have antibody against it.

- Bacteria
- Parasites (giardia and entamoeba histolytica)

Pathogenesis of diarrhea:

- Villous damage causes malabsorption
- Enterotoxin bind to cells = increase intracellular cAMP = causes fluid goes reverse the normal direction = secretory diarrhea
- Cytotoxin kills lining mucosal cells.
- Invasion like salmonella = inflammatory G.E

Bacteria Gastroenteritis

- Salmonella enteritides (most important)
- Shigella spp.
- Campylobacter jejuni
- Vibrio cholera
- E. Coli some serotypes (most common cause of traveler's diarrhea)
- C. difficile in patient using antibiotics
- Transmission: contaminated food or drink
- Presentation: abdominal pain, nausea, vomiting, diarrhea +/- fever fever when there is invasion
- Diagnosis: stool microscopy & culture looking for pus cells
- Treatment: fluids PO/IV oral when there is no vomiting
- Antibiotics: -only for severe cases or impaired immunity

- In shigella and cholera usually severe and can infect others and to decrease the duration of the illness

Intestinal Amebiasis:

- Transmission: by cysts
- Causes invasive colitis
- Presentation: asymptomatic acute dysentery characterized by lower abdominal pain = left iliac fossa = with diarrhea which is initially watery then it becomes frequent loose in small quantities associated with tenismus.
- Chronic amebiasis period of diarrhea for a week then recovery or constipation then diarrhea and so on for weeks and months.
- Complications: liver abscess necrotic material within a space
- Diagnosis: stool microscopy, serology cysts or trophozoites. Serology is important in diagnosis of liver abscess.
- Treatment: metronidazole

Giardiasis:

Giardiasis (popularly known as beaver fever) is a zoonotic parasitic disease caused by the flagellate protozoan *Giardia lamblia* (also sometimes called *Giardia intestinalis* and *Giardia duodenalis*). The giardia organism inhabits the digestive tract of a wide variety of domestic and wild animal species, as well as humans. It is the most common pathogenic parasitic infection in humans worldwide.

- Transmission: Giardiasis is transmitted via the fecal-oral route with the ingestion of cysts
- Colonise upper small intestine
- Presentation: asymptomatic – mild to moderate: abd. pain, flatulence
- May become chronic
- Diagnosis: stool microscopy
- Treatment: metronidazole

In amebiasis and giardiasis, the chance of finding a parasite by a single examination is 30% **(So do it three times)**

Dr. mentioned this time line to help you in your differentials.

Food poisoning

- A. Vomiting within 6 hrs of eating **staph aureus**
- B. Abd pain, diarrhea after 8 – 16 hrs **clostridium perfringens**
- C. Abd. Pain, diarrhea after 16 – 48 hrs **bacterial**
- D. Abd. Pain, diarrhea, fever 16- 48 hrs **bacterial (invasion)**

SUMMARY

- Typhoid fever is an acute febrile disease, caused by *Salmonella typhi* and *S. paratyphi* A, B,C
- Brucellosis transmitted to human by contact with fluids or meat from infected animals
- Causes of gastroenteritis are Viruses (rotavirus), Bacteria, Parasites (*giardia* and *entamoeba histolytica*)
- Intestinal Amebiasis is asymptomatic and complicated to liver abscess and diagnosis by stool microscopy and Treat it by metronidazole
- Giardiasis is asymptomatic and colonise upper small intestine, Diagnosis: stool microscopy, Treatment: metronidazole
- Bacteria Gastroenteritis Present with abdominal pain and Diagnosis by stool microscopy & culture and Treat it by fluids

432 Medicine Team Leaders

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