



كلية الطب والجراحة



جامعة أسيوط ٦ أكتوبر

Food-borne infections

Typhoid

Hepatitis A

Poliomyelitis

Dr Yasmine Hamdy

Lecturer of Preventive Medicine

151307@o6u.edu.eg



What doesn't kill you
makes you stronger 🎵

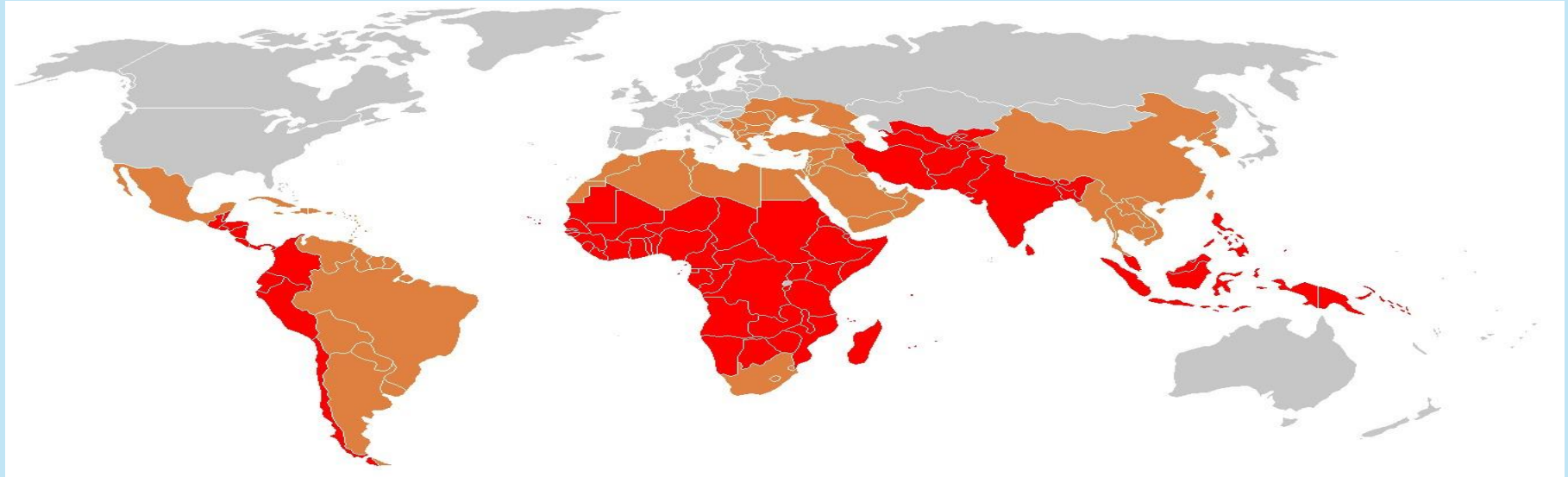
Typhoid Fever

(Enteric Fever)



- Typhoid is an acute infectious bacterial disease characterized by systemic and intestinal manifestations.
- Most of the burden of the disease occurs in the developing world, where it is highly endemic
- Most cases in developed countries are imported from endemic areas.
- The **disease** is endemic in Egypt in the form of sporadic cases throughout the year with significant rise in incidence during summer months .
- Salmonellae have more than **2000 serotypes**, of which pathogens of human disease are:
 - Typhoidal salmonellae: S. typhi, and S. Paratyphi A, B, and C.
 - Non-typhoidal salmonellae, of salmonella food poisoning and salmonellosis.

Typhoid fever is prevalent in many regions in the world

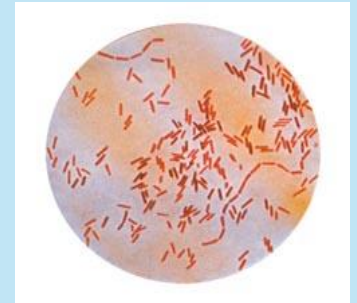


-  High endemicity (>100 cases per lac per year)
-  Medium endemicity (10 cases per lac per year)
-  Low endemicity (<10 cases per lac per year)

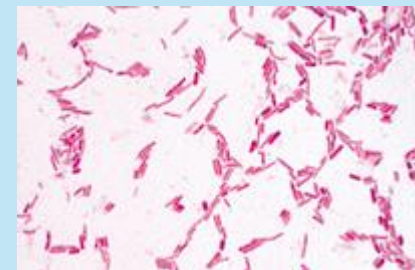
Causative Organism

Salmonellae have more than **2000 serotypes**, of which pathogens of human disease are:

- **For Typhoid**: Salmonella Typhi (typhoid bacillus), with a big number of serotypes.



- **For Paratyphoid**: there are three serotypes of Salmonella Paratyphi A, B, and C
 - (B is the most common, followed by A, while C is rare).



Carriers of Typhoid fever

- **Incubatory carrier**: organisms are found in feces in the last days of the incubation period.
- **Convalescent carrier**: about 10% of convalescents become carriers, either temporarily for some weeks or months, or chronic (2-5% of convalescents).

Carriers of Typhoid fever

- Contact carrier: for about two weeks.
- Healthy carrier: acquired subclinical infection from a polluted environment (usually water), for about two weeks.

The carrier state of typhoid is favored by the presence of cholecystitis and urinary lesions

- The exit of the infection is through
- Small intestine (Peyer's patches) and gall-bladder: organisms find exit in faeces
- Kidney: organisms find an exit in urine
- Fecal carriers are more common than the urinary.



■ **Mode of Transmission**

- Ingestion of contaminated food and water
- Direct hand-to-mouth infection.

■ **Incubation period: 8-14**

■ **Clinical picture**

First week: malaise, headache, cough & sore throat in prodromal stage. The disease classically presents with step-ladder fashion rise in temperature ($40 - 41^{\circ}\text{C}$) over 4 to 5 days, accompanied by headache, vague abdominal pain, and constipation or pea soup Diarrhoea

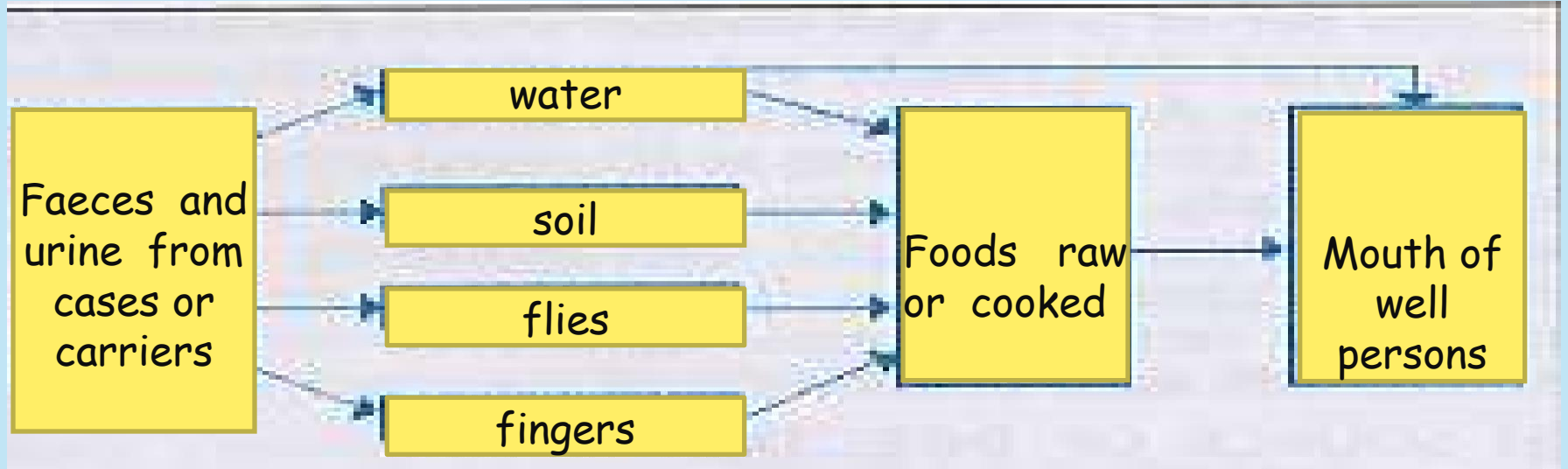
Second week: Between the 7th -10th day
hepato- splenomegally with Relative and rose
spots may be seen.

Third week: Prolonged apathy, toxemia,
delirium, disorientation, and/or coma.

Diarrhoea will then become apparent

Complications: Intestinal haemorrhage,
intestinal perforation, cholecystitis,
thrombophlebitis , myocarditis, pneumonia,
osteomyelitis, bone abscesses and others

Case fatality: 15-30% in untreated cases and
decreases with treatment to 1-2%.



Symptoms of Typhoid Fever



High fever.



Chills.



Loss of appetite.



**Stomach
(abdominal) pain.**



**“Rose spots” rash.
(usually on chest/stomach).**



Cough.



**Muscle
aches.**



Headache.



Nausea, vomiting.



Diarrhea or constipation.

• **Laboratory Diagnosis:**

- **Blood culture:** during the stage of bacteraemia (the first week): a positive culture is conclusive, but a negative culture does not exclude the disease.
- **Widal test:** agglutination test, to show the presence of a diagnostic titer of agglutinins in serum. Antibodies begin to rise in the 2nd week of disease.
- High titre O and low titre H suggest recent infections, while the reverse suggests past infections.
- **Stool and urine culture:** in the second and third week, and they should be repeated three times. Practically valuable to detect carriers, rather than for diagnosis.

IMMUNITY: relative immunity after infection (clinical and subclinical) or immunization, but not enough to protect against subsequent infection of large doses and large numbers of organisms.

Prevention

General: Sanitary environment (the chief preventive measure)-
Health education

Specific: Active Immunization

Two vaccines are available, parenteral heat-killed, and oral a virulent.

TAB Vaccine: Killed, containing *S. typhi* bacilli, *S. paratyphi* A and B bacilli. It is the vaccine used in Egypt. Adults are given two doses of 0.5 and 1.0ml SC, 4 weeks apart. Children over two years can be given a smaller dosage.

Booster Doses: When necessary, a booster adult dose of 1.0 ml (and smaller for children) is given every 3 years.

It can cause swelling, redness and tenderness. Sometimes general manifestations as fever, malaise, and headache.

It provides moderate immunity (50-75%), and may not be protective on exposure to heavy infection

TABC vaccine: added Paratyphi C, where it is endemic

- Vaccination in endemic areas is given to **Food** handlers, **Laboratory** workers, or workers in waste disposal - **Inhabitants** of slum areas - **during** epidemics and outbreaks - **Travelers** to endemic areas, and pilgrims.

CONTROL

Case-finding.

Notification to the local health office.

Isolation: allowed at home when sanitary requirements are fulfilled; otherwise, must be at the hospital.

Disinfection concurrent, for excreta (by 1% crude phenol), and articles and fomites, **and terminal** for objects, and cleaning of the room.

Treatment: general and specific chemotherapy.

: after 3 negative cultures of stools and urine, 24 or more hours apart.

First sample is taken two weeks after drop of temperature to normal (to exclude possibility of relapse).

Control of Contacts

- Surveillance for two weeks, from the date of last exposure to the case, for case-finding.
- Diagnosis, especially among food handlers by Widal test, if positive stool and urine culture can be done (repeated cultures are indicated).
- Health education, to follow clean habits, especially clean hands.
- For chronic gall-bladder carrier, Ampicillin for 1-3 months can be tried until three negative successive samples to eliminate infection, but if not, cholecystectomy is indicated.
- For chronic urinary carrier, surgical management when indicated may remove the pathological focus of infection.

Measures to be taken when epidemic or outbreak threatens to occur:

- 1. Sanitary measures :** super chlorination of water supply, control of flies, sanitary disposal of wastes, and strict food and milk sanitation.
- 2. Health education** of the public for preventive measures, and early manifestations of disease, to seek medical care if they appear.
- 3. Vaccination of at-risk group or population.**
- 4. Epidemiologic study,**
to trace source(s) and channel(s) of infection.





Viral A Hepatitis (HAV)

- Hepatitis is inflammation of the liver cells.
- Clinical picture varies widely from an inapparent case up to severe hepatocellular dysfunction
- HAV is a communicable food-borne viral acute disease involving the liver and was formerly known as “Infectious hepatitis”
- Worldwide, in the form of sporadic cases, outbreaks, and epidemics
- Reservoir: Man (Cases and Incubatory carriers)

Mode of transmission

Feco-oral transmission .(main mode)

- Directly by contaminated hands. (hand to mouth)
- Vehicle by contaminated water or food. (ingestion)

Parenteral transmission: rarely from blood during viremia.
Due to a short period of viremia (only a few days)

Incubation period: up to 50 days

Period of communicability: Last week before symptoms-
throughout the illness and 1-2 weeks in stool after the
appearance of jaundice

Clinical picture

- Unapparent cases: mild anicteric cases,
showing an influenza-like picture and pass unnoticed.
- Classical disease.
- Severe, fulminant, rapidly fatal disease.



Diagnosis

A) Clinical

- Classical disease can be suspected: By dark-coloured urine and jaundice.
- Clinical diagnosis is thus difficult early in the disease, and in an-icteric cases.

B) Laboratory

- Detecting the virus in stools, by electron microscopy, early in the disease.
- Serologic testing for IgM in acute disease.
- Liver function tests: elevated liver enzymes (not specific)

Prevention

A) General

- 1- Environmental sanitation: Food sanitation-Water sanitation-Sanitary waste and sewage disposal- Insect and rodent control
- 2- Health education of the public about good sanitation and personal hygiene.
- 3- Precautions to prevent parenteral transmission.
(sanitary blood transfusion, disposable syringes)

B) Specific

1-Active Immunization: The vaccine used is:

- Killed vaccine
- Two doses, 1 ml each, IM, in the deltoid, 4 weeks apart
- Given to: (high-risk groups)
 - International travellers to endemic areas if they are going to stay for a long time, ie, more than 3 months
 - Persons in closed communities with insanitary conditions where the disease is endemic.



2-Seroprophylaxis

Human Normal Immunoglobulin is administered either before expected exposure or within a few days after exposure.

- **Given to:**
 - Household or other intimate contacts:
 - At-risk group, when the outbreak spreads in a closed community (camp, school, institute).

Control of the reservoir is difficult because:

- Large number of subclinical cases.
- Fecal excretion of the virus is mostly during the IP.
- There is no specific treatment.

1)Case Finding: clinically and lab. **Notification:** should be made to the local health authorities. **Isolation:** at home, though practically difficult with mild cases.

Disinfection: Sanitary disposal of feces, urine, and blood

Treatment: Symptomatic treatment

➤General: Bed rest.

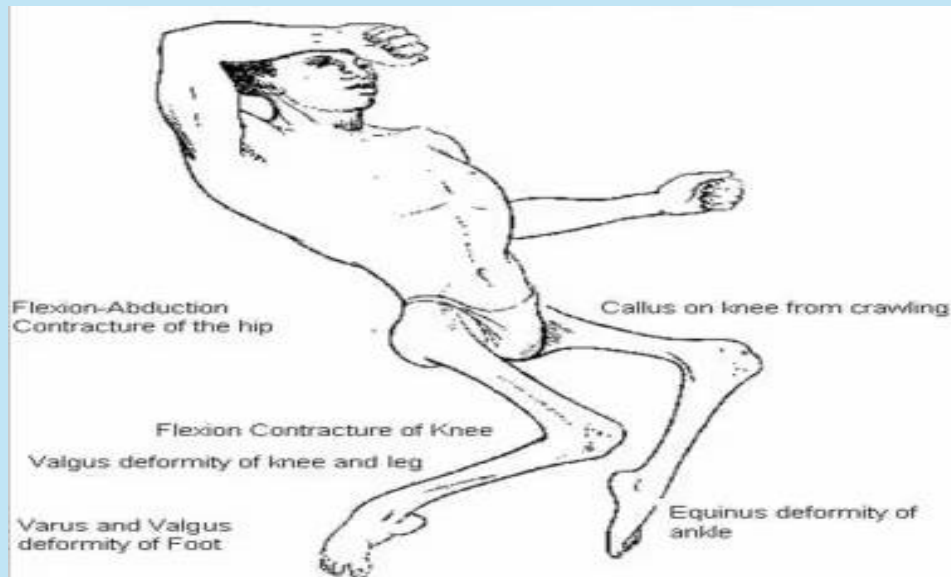
➤Release: After clinical recovery, about one month after the onset of disease.

2) Contacts: -Enlistment -Immunization: Active and passive immunization should be given as soon as possible, within 2 weeks of exposure- **Examination:** for early case finding-**Surveillance:** for 6 weeks

3) Epidemic measures: Rules of food sanitation must be strictly followed - Seroprophylaxis of at-risk individuals or group- Epidemiologic study, to trace sources and channels of infection.

Poliomyelitis

- Acute viral infectious disease that may lead to flaccid paralysis.
- There are 3 serotypes, Type 2 and 3 have been eradicated worldwide, 2015-2018, respectively
- In Egypt, one case was reported in 2003 and another one in 2004.
- Now Egypt is in the stage of poliomyelitis elimination.



1. Infectious agent:

- * Polio-virus is an enterovirus with three antigenic types: 1,2 & 3.
- * All types can produce paralysis, but **type 1** is the most **common** type to cause **paralysis** and **epidemics**.
- * No cross-immunity exists between the three strains.

2. Occurrence: * High in developing countries. *(90%) below five years of age.

* The number of cases of poliomyelitis occurring every year is nearly ten times more than the reported cases due to poor reporting.

3. Reservoir: usually, children, as either a case or a carrier, represent the only reservoir. *Carriers are mostly short-term, not exceeding a few weeks.

4. Transmission:

Route of transmission:

1.The **major** route of transmission is **faecal-oral** in **developing** countries.

1.**Droplet** during epidemics in **developed** countries.



5. Communicability:

- **Contact and healthy carriers:** about two weeks.
- **Cases:** infectious for about 6-8 weeks, which include incubatory carriers (last days of incubation period), clinical period, and convalescent carriers (temporary, for some weeks).

6. Susceptibility and immunity:

- * Immunity with OPV (oral polio vaccine) is thought to be lifelong.
- * Infants born to immune mothers have antibodies that protect them for a few weeks.

7. Incubation period: 7-14 days

Sequelae of Polio infection

1-Inapparent infection: in 72% of cases, and are considered carriers

2-Manifest disease:

***Minor illness:** 23% have Fever, malaise, muscle pain, headache, nausea, and/or vomiting.

***Non-paralytic poliomyelitis:** in 4% of those who develop a minor illness followed by meningitis lasting for 2-10 days, then recovery

***Major illness:** 1% CNS involvement causing flaccid paralysis.

It is usually asymmetric (not affecting both sides equally). The most common pattern is involvement of one leg, followed by one arm.



- **Prevention:**

- **I. General:** Environmental sanitation

- -Proper waste disposal- Safe water supply

- **II. Specific:** By active immunization.

- **There are two types of vaccines against poliomyelitis:**

- **1. Sabin vaccine:**

- 2 oral drops of live attenuated vaccine, stored at temperature 2-8 degrees given at 0, 2, 4, 6, 9 months and a booster dose is given at 18 months.

- **N.B.**

- Repeat the dose if the child spits out the drops.

- Lactation has no effect on the potency of the vaccine.

- The vaccine may not be effective if the child has diarrhea. So after giving the three doses, an additional dose is given after 4-8 weeks. There is no harm in repeating the vaccination.

- **2. Salk vaccine:** 0.5 ml of killed vaccine IM, at the age of 2, 4, 6 months



Control

I. Measures for the cases:

Early case-finding is not practical.

Isolation at home, or fever hospital if necessary.

Concurrent disinfection

Medical care and treatment

Rehabilitation of paralytic cases.

Release after treatment, and satisfactory muscle and general condition.

It usually takes more than two months when the case is no longer infectious.

II. Measures to contacts:

1. Listing. 2. Supervision for max. I.P. = 2 WEEKS. 3. Mass immunization program.

III. Measures to the environment:

1. Proper environmental sanitation. 2. Disinfection. 3. Find the source of infection.



THANK YOU!