كلية الطب والجراحة

جامعة ٦ اكتوبر

Food-Borne Diseases

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Diarrheal Diseases

- It is a clinical syndrome that includes a variety of pathological conditions having diarrhea as the main presenting symptom in common.
- They cause diarrhea through either producing intestinal secretion or interfering with the absorption of fluid from the intestine

Definition of diarrhoea

- Increased bowel motions than the usual own pattern of individual.
- **But general definition** is the passage of three or more abnormal loose stools that may be associated with fever, vomiting, and change in color, and presence of blood, pus or mucus.

Etiology

- Infectious food poisoning
- Infective diarrheal disease of children, such as Rotavirus, E. coli, Giardia Lamblia
- Dysenteries
- Cholera
- Shigellosis

1- Infectious Food Poisoning

Staphylococcal Food Poisoning	Botulism	Salmonella Food Poisoning
The commonest form of food poisoning that may occur as outbreaks in families and confined groups.	It is a rare highly fatal food intoxication. Sporadic cases may occasionally show in families commonly practicing home preservation of vegetables.	Occurs in Egypt in the form of outbreaks.

For Botulism, this is not the case in Egypt, which is almost free of botulism. Some cases (and fatalities), however, have been reported in 1991 and 2109, and attributed to consumption of salted raw fish.

	Staphylococcal Food Poisoning	Botulism	Salmonella Food Poisoning
Agent	**Preformed thermostable enterotoxin (exotoxin), produced by certain strains of *Staphylocous aureus***	**the exotoxin of *Clostridium botulinum* (anaerobic spore - forming bacillus). It is a neurotoxin, which is very potent in minute amount.**	**Non typhoidal Salmonellae, with many serotypes. They are relatively resistant outside the body. Reported outbreaks in Egypt are mainly caused by Salmonella typhimurium and S. enteritidis**

Staphylococcal Food Poisoning	Botulism Reservoir of infection	Salmonella Food Poisoning
1.Man, commonly: Cases with skin lesion and respiratory infection.Carriers more than 5% of population have foci of infection in nose and skin.	***1.the soil:*** it is the habitat of *Cl botulinum,* found in the form of spores. Grown (cultivated) vegetables, fruits and other products get contaminated with spores from he soil.	**Animals (mainly),** and **Man**.: **1.Rodents** : infected (diseased or carriers) rats & mice pass S.typhimurium in excreta, that may contaminate food.
2.Cattle with staphylococcal mastitis. Organisms may contaminate milk.	**2.** ***Animals*** **:** the organism may be a commensal in the intestine of cattle, pigs and other animals. It finds exit in excreta, to sporulate, contaminating the soil.	**2.*Cattle & Swine*** : when having generalized salmonella infection Organisms in intestine pass with excreta, and may contaminate milk or food. Organisms are found in the tissues.
		***3.*Poultry**: turkeys, ducks, geese and chicken. Salmonellae are found in eggs and tissues of infected poultry.(Eggs get infected either directly in oviduct, or through cracked shell from pollute soil).
		4.Man : cases & convalescent carriers (usually temporary, rarely chronic). Organisms arc found in small intestine, and find exit with faeces, to spread infection.

	Staphylococcal Food Poisoning	Botulism	Salmonella Food Poisoning
Mode of Trans mission	Ingestion of enterotoxin-contaminated food or milk, by Respiratory discharges of food handlers. **Factors favoring:** • Much handling •Sufficient time between contamination and consumption of food, under room temperature, without refrigeration. **Important foods**: milk, cream, pastries, cakes, and some popular foods.	Consumption of food that contains preformed exotoxin of *Cl. botulinum*. • Home - preserved vegetables, e.g. peas and olives, without proper sterilization preservation provides anaerobic medium for growth of organisms and secretion of exotoxin. • Packed and canned meats, sausages and fish : risk of botulism has been eliminated at present, through modern food technology in big manufacturing factories. • Packing of salted raw fish ("fessikh"), under primitive insanitary conditions, is associated with potential risk of botulism. It has been accused for some reported cases in Egypt. 1991.	1. Ingestion of food from infected a)Animals (cattle, swine) : meat, meat products, e.g. sausages. b)Poultry : eggs, meat, meat products. 2. Ingestion of any food that may be contaminated by • Excreta of animals, rodents or man. • Flies and cockroaches, handling, and dust. 3. Water, when polluted with excreta of man or animals. 4. Hand-to-mouth infection, in sporadic cases

	Staphylococcal Food Poisoning	Botulism	Salmonella Food Poisoning
Incubation Period	2-6 hours	12-36 hours.	12-36 hours
Clinical Picture	abrupt onset of acute gastro-enteritis, with severe nausea, abdominal cramps, vomiting and diarrhea, and slight or no fever or subnormal temperature.	paralysis of oculomator and other cranial nerves causes visual disturbance(diplopia, loss of accommodation), dysphagia, dysphonia and respiratory paralysis	*a) Outbreaks* : gastro-enteritis is the common picture, with sudden onset of abdominal cramps, diarrhoea, nausea and vomiting, and slight fever.

	Staphylococcal Food Poisoning	Botulism	Salmonella Food Poisoning
Clinical Picture	Manifestations persist for some hours only, followed by recovery. **Fatality**: is almost nil.	***Case-fatality*** : high, up to 70% or more, in few days, due to respiratory failure	b)Sporadic cases of salmonella infection show "salmonellosis", with enterica - like picture rather than acute diarrhoea and vomiting. Bacteraemia of salmonellosis may be complicated with arthritis, cholecystitis and others. ***Case-fatality*** : self-limited and clears in days with nearly no fatality

	Staphylococcal Food Poisoning	Botulism	Salmonella Food Poisoning
Prevention	1. H.E. of food handlers. 2. Safe food preparation. 3. Screening for carriers among food handlers.	*1. Proper processing of canned food (home-canned food must be boiled for at least 10 minutes).* *2. Safe food preparation.*	1. H.E. of food handlers 2. Safe food preparation. 3. Screening for carriers among food handlers.

2- Cholera

- An acute bacterial enteric **quarantinable** disease.
- It is one of the oldest and best understood epidemic diseases.
- Epidemics and pandemics are strongly linked to in sanitary water supply, poor sanitary conditions and over crowdness.

Causative agent:

•Contaminated food or water with ***Vibrio cholera***.

Mode of transmission:

- Through ingestion of contaminated water or food.

- Beverages prepared with contaminated water, and sold by street vendors, ice and even commercial bottled water have been incriminated as vehicles in cholera

Clinical picture: **2 hr-5 days**, then painless, Rice watery diarrhea that can quickly lead to death, and severe vomiting in most patients.

Most persons do not become ill, although the bacterium is in their feces for **7-14** days. **Less than 20%** of ill persons develop typical signs and symptoms, 20% of which develop severe watery diarrhea with vomiting.

General Prevention and control

1. Case management **80%** only need oral Rehydration salts.

* Prompt treatment makes case-fatality rate below **1%**.

* In **untreated** cases the case fatality rate may reach **30-50%**.

2. Surveillance systems:

Sensitive surveillance and prompt reporting contribute to the rapid containment of cholera epidemics. Surveillance systems can provide an **early alert** to **outbreaks.**

3. Multisectoral approach: between health, water and sanitation, agriculture, and education departments.

4. Water supply and sanitation

5. Personal hygiene and health education.

6. Vaccines: safe & effective Live oral vaccine for use by individuals and health personnel.

Specific prevention and control Treatment of cholera(as before)+

* The **oral rehydration salts** nearly always results in cure.

* **Severe cases**, **I.V administration** of fluids required to save the patient's life.

Vaccination

- Killed cholera vaccine (Koll's vaccine)

  2 doses 0.5 ml and 1 ml 4 weeks apart, and boosting every 6 months.

  - Providing only partial protection (50% efficacy) of short duration (3-6 months).
  - Do not prevent asymptomatic infection and carrier state.
  - Associated with adverse effects.
- Not recommended by WHO.
- It gives a false impression to the public, leading them to neglect other preventive measures.

Two oral cholera vaccine

- Both are Safe.
- Provide significant protection for several months against cholera caused by O1 strain.
- Used by travelers from industrialized countries.
- One is a single dose **live attinuated vaccine** (strain CVD 103-HgR)
- The other is a **killed vaccine** consisting of inactivated vibrios plus B-subunit of the cholera toxin, given on a two-dose regimen.

Chemoprophylaxis

- **Tetracycline** oral capsules either 500 mg/6 hours for 3 days or a single dose of 1 gm, half the dose for children.

- **Doxycycline,** a single daily dose of 300 mg for 3 days. Half the dose for children.

- It is given to contacts of cases, international travelers, and pilgrims after returning.

International measures

- Notification to WHO.
- Chemoprophylaxis by tetracycline or Doxycycline for travelers coming from endemic or infected areas.
- Vaccination certificate is not required internationally since the vaccine is not potent.

Epidemic measures

- Education of the public and population at risk about the mode of transmission and preventive measures.
- Ensure safe water supply and chlorination.
- Provide appropriate safe sewage disposal.
- Control of house flies.
- Ensure sanitary preparation and supervision of food and drinks.
- Investigate the situation to find the epidemic variables (time, place and person).

Investigation of an outbreak of food poisoning

Features and circumstances of outbreak:

- ***Many cases appear within short time in involved group.***
  - **Cases share common food.**
  - **Manifestations appear after very short incubation period (hours).**
  - **Cases show more or less similar manifestations (gastrointestinal), for short time, and rapid recovery.**

THANK YOU