Food Poisoning

Dr. M. BABY MARIYATRA
Assistant Professor
Department of Chemistry
St. Xavier's College (Autonomous)
Palayamkottai, Tamil Nadu

Staphylococcus Food Poisoning

Organism: *Staphylococcus aureus*

Cause of Illness: This form of food poisoning is caused by a toxin produced by the bacteria. (The toxin is heat stable and is unaffected by boiling for 30 min. Food has enough toxins to cause sickness after 8-10h of incubation in the food.)

Origin of Infection: Nearly all outbreaks of this disease can be traced to a human carrier who has come in contact with food that was subsequently allowed to incubate.

- They may come from food handlers with infections on their hands, or from healthy carriers of the organism that harbor the organism in their noses and throats. Some outbreaks have been traced to dairy products contaminated with staphylococci of bovine origin.

- FOODS INFECTED: Improperly stored and refrigerated custards, processed meats, sandwich spreads, and even milk.

Symptoms:

- Nausea, vomiting, and diarrhea are common, which appear in 2-6 h of ingestion.

- Recovery is usually complete in 24 – 48 hours. Death rarely occurs except in young children or debilitated persons. **Treatment:** Use of drugs for the relief of pain & IV fluids to alleviate dehydration.

- **Patients with Staphylococcus food poisoning should not be treated with antibiotics because many strains of these organisms are becoming resistant, and because the bacteria is inhibited by normal intestinal microbial flora.**

II – Salmonella food poisoning

- Organism: *Salmonella typhimurium* (Gram negative short rods)

- **Cause of Illness (salmonellosis) :** Salmonella bacteria are surrounded by pili that permit the bacteria to adhere to the intestinal lining. They reproduce in the intestines causing inflammation. (endotoxin produced)

- **Origin of Infection:** Ingestion of contaminated foods. Birds and domestic fowl, especially ducks, turkeys, and chickens, (poultry) including eggs. Inadequate cooking of large turkeys and the ingestion of raw eggs contribute to a significant number of cases. (also fish & peanut butter recently)

- Fecal matter from those infected can contribute to transmission by contaminating food and water supplies. It may contain as much as 1 billion cells per gram.

- People can also get salmonellosis if they do not wash their hands after touching the feces of animals. Reptiles (lizards, snakes, and turtles), baby chicks, and ducklings are especially likely to pass salmonellosis to people. Dogs, cats, birds (including pet birds), horses, and farm animals can also pass *Salmonella* in their feces.

- **Symptoms:** abdominal pain, fever, and diarrhea, usually lasts 3-5 days. Symptoms usually occur 8-24 hours after ingestion of contaminated food.

- Nausea and vomiting may happen first, but usually do not persist once the pain & diarrhea begin.

- **Treatment:** Recovery is usually within a week and the patient usually does not require antibiotic treatment. A person suffering from salmonella food poisoning has to ensure that he does not get dehydrated. This is achieved by constantly replacing fluids and electrolytes lost due to diarrhea. While plenty of water should be consumed, it would be best if electrolyte solutions (which are available without a prescription) are utilized

- III – E. Coli(0157)– It can be deadly.
- Organism**:** *Escherichia Coli*

Gram Negative Rods

- **Cause of Illness**: A powerful endotoxin produced by certain strains is second only to botulism toxin in the ability to cause illness.

- **Origin of Infection:** It can be found in undercooked ground beef, raw milk, and impure water (Sewage contamination). It has also been found in chopped lettuce and spinach.

- **Symptoms: Nausea & vomiting** & sometimes fever. Watery, often hemorrhagic (bloody) **diarrhea**, & severe **abdominal cramps**.
- It may last for 10 days.

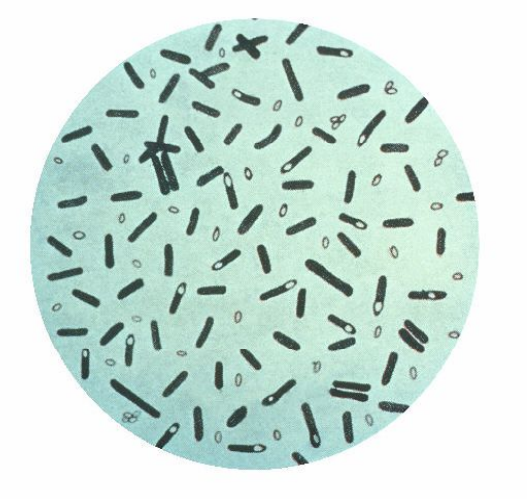
- **LIFE THREATING SYMPTOMS:** (Especially in small children) – urinary tract infection can lead to acute kidney failure. Destroys blood cells. May cause bowel disorders, stroke, seizures blindness, blood clots in the brain, coma, and death.

600 people die from
E. coli poisoning each year

- **Treatment:** If non- life threatening, no major treatment is given. For life threatening infection, transfusions & kidney dialysis, may be necessary.

IV – Botulism (The most serious form of bacterial food poisoning.)

- Organism: *Clostritium botulinum*



- **Cause of Illness:** **neurotoxins** produced by the bacteria (actually types A-E toxins depending on the strain of organism. Type A is found mostly in the US and generally causes the most severe illness.) The toxin is one of the most potent known to man. For mice, a lethal dose of type A toxin is estimated at 0.000000033 mg; this means that 1 g of the toxin could kill 33 million mice.

- Origin of Infection: contaminated canned foods often provides the optimal anaerobic environment for growth of the bacteria. It cannot grow at low pH and thus it is not a problem in acidic foods.

Symptoms: Toxins are absorbed from the intestinal tract and transported by the circulatory system to motor nerve synapses where they block neural transmission. Symptoms of botulism usually appear 8-48h after ingestion of the toxin. The earlier the symptoms appear, the worse the illness will be.

Symptoms generally include: gastrointestinal pain, headache, weakness, constipation, respiratory difficulty, & in severe cases, respiratory failure. The patient usually other neurological symptoms, such as photophobia.

Treatment: Despite medical treatment mortality is about 25%.

Antibiotic treatment is used.

Listeria Food Poisoning (CDC)

- Listeriosis, a serious infection usually caused by eating food contaminated with the bacterium *Listeria monocytogenes*, is an important public health problem in the United States.
- The disease primarily affects older adults, pregnant women, newborns, and adults with weakened immune systems. However, rarely, persons without these risk factors can also be affected. The risk may be reduced by recommendations for safe food preparation, consumption, and storage.

Long Incubation Time

- Up to 2 months can elapse between eating contaminated food and developing listeriosis. This can result in a lag time for reports of infection and therefore it can take longer for authorities to understand the full scope of the problem.

What are the Symptoms of Listeriosis?

- A person with listeriosis usually has fever and muscle aches, sometimes preceded by diarrhea or other gastrointestinal symptoms. Almost everyone who is diagnosed with listeriosis has "invasive" infection, in which the bacteria spread beyond the gastrointestinal tract. The symptoms vary with the infected person.

- About 800 laboratory-confirmed cases of *Listeria* infection are reported each year in the United States and typically 3 or 4 outbreaks are identified.
- The foods that typically cause these outbreaks have been deli meats, hot dogs, and Mexican-style soft cheeses made with unpasteurized milk.

- Produce is not often identified as a source, but sprouts caused an outbreak in 2009, and celery caused an outbreak in 2010. (Cantaloupe more recently)

To prevent an infection with *Listeria*:FDA recommendations for washing and handling food.

- **Rinse** raw produce, such as fruits and vegetables, thoroughly under running tap water before eating, cutting, or cooking. Even if the produce will be peeled, it should still be washed first.
- **Scrub** firm produce, such as melons and cucumbers, with a clean produce brush.
- **Dry** the produce with a clean cloth or paper towel.
- **Separate** uncooked meats and poultry from vegetables, cooked foods, and ready-to-eat foods.