Food poisoning

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LEARNING OUTCOMES

- Definition of food poisoning .
- Distinguish between intoxication and gastroenteritis
- Describe the virulence factors of Staphylococcus that allow it to cause microbial intoxication.
- Describe methods to prevent food poisoning

Definition

- Food poisoning syndrome results from ingestion of water and wide variety of food contaminated with pathogenic microorganisms (bacteria, viruses, protozoa, fungi), their toxins and chemicals.

- Food poisoning is a rather broad term used collectively to refer to consuming either pathogens or their toxins.

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- Food poisoning must be suspected when an acute illness with gastrointestinal or neurological manifestation affect two or more persons, who have shared a meal during the previous 72 hours.

Bacterial food poisonings

- Food poisoning is the term used when a preformed toxin in food is ingested, resulting in an intoxication rather than an enteric infection.
- Infections of the gastrointestinal tract are more appropriately referred to as gastroenteritis.
- Bacterial intoxications (toxifications), which are food poisonings caused by toxins the microbe itself is either not present or not the immediate problem.

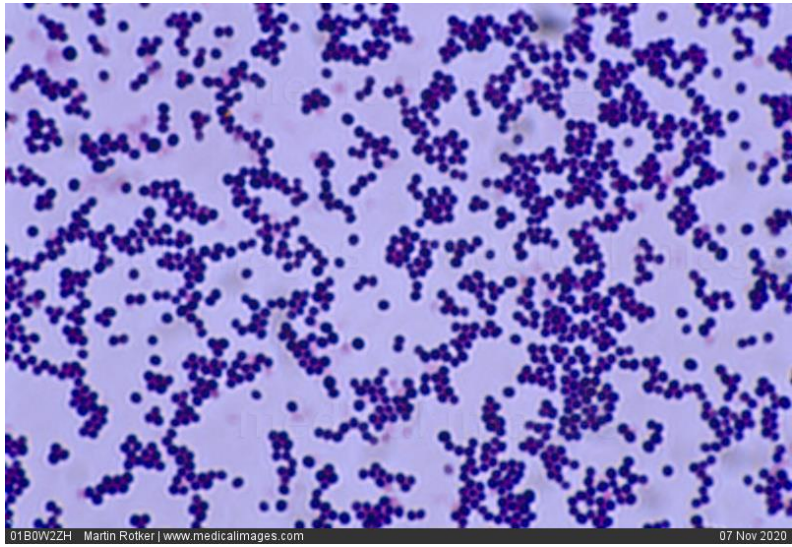
https://www.google.com/search?q=food+poisoning&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjrjNXN5u_sAhXNyaQKHTQiAkoQ_AUoAXoECBoQAw&biw=1366&bih=600#imgrc=5ass52D9JxSPpM

Staphylococcal Intoxication (Food Poisoning)

Causes: *Staphylococcus aureus*

- facultatively anaerobic,
- Gram-positive cells arranged in clusters.

Virulence factors: Heat-stable enterotoxins, salt tolerance.



Portal of entry: Toxin crosses mucous membranes of the intestinal tract following consumption of contaminated food; Staphylococcus is not directly involved in the disease.

Signs and symptoms: Nausea, vomiting, diarrhea, cramping, discomfort, bloating, loss of appetite, and fever; all lasting 24 hours or less.

Incubation period Four to six hours.

Susceptibility: Everyone is susceptible because the organism is a normal member of the microbiome, but intoxication results only when inoculated food is improperly refrigerated or undercooked prior to consumption.

Treatment: Self-administered replacement of fluids and electrolytes.

Prevention: Thorough handwashing before and after handling foods, cleaning utensils between use on different foods, and prompt refrigeration of leftovers all decrease risk of staphylococcal food poisoning.

Signs and symptoms

General symptoms of bacterial intoxication include:

- Nausea, vomiting, diarrhea, abdominal cramping, discomfort, bloating, loss of appetite, and fever.
- Symptoms may range from mild to severe. Some types of intoxications also produce weakness, headache, and difficulty in breathing.
- Dehydration resulting from fluid loss in diarrhea may become significant, but most cases, exemplified by staphylococcal food poisoning, are self-limiting and last no more than 24 hours.

Pathogenesis and virulence factors

- Toxins of Staphylococcus aureus, which is a normal member of the microbiome of the skin and upper respiratory system, cause staphylococcal food poisoning. This is a common type of bacterial food poisoning.

- Food preparers frequently introduce Staphylococcus from their bodies into foods during cooking. The bacterium is salt tolerant and grows particularly well in foods at room temperature, where it produces toxins.

- Foods commonly associated with staphylococcal food poisoning include processed meats, custard pastries, potato salad, and ice cream.
- S. aureus has several virulence factors, but important ones in cases of food poisoning are five enterotoxins. These proteins (designated A through E) stimulate intestinal muscle contractions, trigger nausea, and cause intense vomiting.
- The enterotoxins are heat stable, remaining functional at 100°C for up to 30 minutes, which means they are not usually inactivated by warming or reheating food

Pathogenesis and Epidemiology

- Bacterial intoxication can affect a single individual or hundreds of people at once.
- Outbreaks are usually associated with picnics, school cafeterias, or large social functions where food stands unrefrigerated or where food preparation is less than optimal. It takes several hours at room temperature or higher for Staphylococcus to grow and secrete toxins.
- Staphylococcus does not change the appearance or taste of food. Because most cases of staphylococcal food poisoning are self-limiting and relatively mild, the number of cases is unknown—by the time a patient would see a doctor, the symptoms are gone.

Diagnosis

- Diagnosis is generally based on signs, symptoms, and patient history.
- Tests may be done on samples from vomit, blood, stool, or any leftover food deemed suspicious.
- Stool cultures positive for S. aureus are indicative of staphylococcal food poisoning, but other examinations are often inconclusive.

Treatment

- Replacement of fluids and electrolytes is the preferred treatment and can be self-administered.

Prevention

- Good hygiene and proper food handling reduce incidence

References

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