**ABSTRACT**

|Despite our society’s advances in sanitation, food preservation, and hygiene, the prevalence of food borne diseases remain high (12.6 million cases per year in the United States). Although there is constant need for education of food handlers and consumers, there is also a need for continued vigilant monitoring of coastal waters, meat packing facilities and imported foods. As long as antibiotics are used in poultry and cattle feeds, one can expect the incidence of antibiotic-resistant food borne pathogens to rise. There are several promising areas of research in the field of food borne illnesses. Molecular biologists are actively characterising the genes that enable the invasive enteric pathogens such as Salmonella and Yersinia to enter tissues, and the bacteria toxins associated with secretory diarrhoeas continue to be the subject of intense scrutiny. Epidemiologists’ are implementing new techniques such as DNA fingerprinting and multilocus enzymes electrophoresis for tracing pathogens in disease outbreak. Similarly, the use of computers in the food industry facilitates the tracing of contaminated foods. Although the rate of food borne illness may not decrease significantly during the next decade, we can expect more rapid identification and tracing of outbreaks as well as an improved understanding of the pathogenesis of the food borne diseases.

**INTRODUCTION**

What is Food Poisoning

Food poisoning is an acute illness, usually of sudden onset, brought about by eating contaminated or poisonous foods. It might be contaminated by bacteria, viruses, and environmental toxins or toxins present within the food itself, such as poisons in mushrooms or seafood. Symptoms of food poisoning are usually gastro-intestinal, such as nausea, abdominal pain, vomiting, and /or diarrhoea. Some food borne toxins can affect nervous systems. Food poisoning is sometimes called gastroenteritis or infectious diarrhoea.

Every year millions of people of all ages suffer from bouts of vomiting and diarrhoea blamed correctly on something they ate. According to the Centre for Disease Control and Prevention (CDC), up to 33 million cases of food poisoning are reported in the United States every year. Many cases are mild and pass so rapidly that they are never diagnosed. Occasionally, a severe outbreak affects many people at once, creating news worthy public health hazard. Although the food supply in the United States is one of the safest in the world, anyone can get food poisoning.

Food Poisoning Symptoms

* Abdominal cramps
* Diarrhoea
* Vomiting
* Loss of appetite
* Mild fever
* Weakness
* Nausea
* Headaches

Symptoms of Life-Threatening Food Poisoning

* Diarrhoea may persist for more than three days
* A fever higher than 101.5°F
* Difficulty seeing or speaking
* Severe dehydration, which may include dry mouth, passing little or no urine, difficulty keeping fluids down
* Bloody urine

Causes Of Food Poisoning

It may be caused by one of these:

* Bacteria or their toxins
* Chemical including metals
* Plants or fish
* Viruses
* Mycotoxins
* Parasites

Types of Bacteria:

There are two major types of bacteria that cause problems in the food industry:

* Spoilage Bacteria- responsible for the decomposition of food
* Pathogenic Bacteria- responsible for causing illness such as dysentery, typhoid and food poisoning.

Bacteria is by far the most prevalent cause of food poisoning. When thinking of dangerous bacteria, names like E. coli, Listeria, and Salmonella come to mind for good reason. Salmonella is by far the biggest culprit of serious food poisoning cases in the United States. Campylobacter and C. Botulinum (botulism) are two lesser known and potentially lethal bacteria that can lurk in our foods. Each bacterium has their incubation time or period and all except botulinum toxin cause inflammation of intestines and diarrhoea. We also have Shigella and Staphylococcus aureus as part of the bacteria that causes food poisoning. The severity of symptoms depends on the type of bacteria, the amount consumed, and the individual’s general health and sensitivity to the toxins.

Salmonella is found in the egg yolks of chickens that are infected, raw and undercooked poultry and other meats, diary products, fish, shrimp, and many other foods. Although thorough cooking kills bacteria, making foods harmless. Salmonella can also be found in faeces of pet reptiles such as turtles, lizards and snakes. Symptoms of food poisoning such as

Abdominal pain, diarrhoea, fever and vomiting begin eight to seventy two hours after eating foods contaminated with salmonella. It lasts for 1-5days. Dehydration may be a complication of severe cases with persistent vomiting and/or diarrhoea.

E. coli strains are not all harmful. The strain that causes the most severe food poisoning however is E. Coli0157:H7 which affects three people in every 20,000. The food borne organisms are found mainly in food derived from cows, such as raw milk and rare ground beef. Fruits or vegetables can also be contaminated. Symptoms are always slower to appear than those caused by food borne bacteria. Because E.coli toxins are produced in larger intestines than higher up in the digestive systems. It occurs from one to three days after eating the contaminated food. Those affected have severe abdominal cramps and watery diarrhoea that usually becomes bloody within 24 hours, a condition that can last between 1-8 days.

Shigella is a common cause of diarrhoea for travellers to developing countries. It is associated with contaminated food and water, crowded living conditions and poor sanitations. The toxins affect the small intestine. Symptoms of the infection appear about 36-72 hours after eating contaminated food. In addition, familiar watery diarrhoea, nausea, vomiting and abdominal cramps, the individual may have chills, fever, and neurological problems. The diarrhoea may even progress to classic dysentery. It may include confusion, headache, lethargy, a stiff neck, and possible seizures. The symptoms may also resemble meningitis.

It usually runs in 2-3 days but may last longer. Dehydration is the most common complication. Most people recover on their own, although may feel exhausted. Children who are malnourished or have weakened immune systems may be severely affected and death can result.

**THE MAIN FOOD POISONING BACTERIA**

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| --- | --- | --- | --- |
| Type of food Poisoning | Where the bacteria come From | Onset time | Symptoms |
| Salmonella | Raw meat, egg and poultry | 6-72 hours | Abdominal cramps, diarrhoea, fever, vomiting, dehydration |
| Clostridium perfringens | Raw meat, eggs, soil, excreta, insects | 8-72 hours | Abdominal pains, diarrhoea |
| Staphylococcus aureus | Skin, nose, boils, cuts, raw milk | 1-6 hours | Vomiting, abdominal pains lower than normal temperature |

Bacteria need all four of these to multiply;

* Food
* Moisture
* Warmth
* Time

**PARASITES**

Food poisoning caused by parasites is not as common as food poisoning caused by bacteria, but parasites spread through foods are very dangerous. Toxoplasma is the parasite seen mostly in cases of food poisoning. It’s typically found in cat litter boxes. Parasites can live in your digestive tract for year’s undected. However, people with weakened immune systems and pregnant women risk serious side effects if parasites take up residence in the intestines

**VIRUSES**

Food poisoning caused by the virus include the norovirus, also known as the Norwalk virus, causes over 19 million cases of food poisoning each year. In rare cases, it can be fatal. Sapovirus, rotavirus and astrovirus bring on similar symptoms, but they are less common. Hepatitis A virus’s a serious condition that can be transmitted through food.

**HOW CAN FOOD BECOME CONTAMINATED**

Pathogens can be found on almost all the foods that humans eat. However, heat from the cooking usually kills pathogens on food before it reaches our plates. Foods eaten raw are common sources of food poisoning because they don’t go through the cooking process.

Occasionally, food will come in contact with the organisms in faecal matter. This most commonly happens when a person preparing food does not wash their hands before cooking. Meat, eggs and diary products are frequently contaminated. Water may also be poisoned.

**WHO IS AT RISK FOR FOOD POISONING**

Anyone can come down with food poisoning. Statistically, nearly everyone may come down with food poisoning once in their lives. There are some population that are more at risk than others. Anyone with a suppressed immune system or an auto-immune disease may have a greater risk of infection and a greater risk of complications resulting from food poisoning.

According to the Mayo Clinic, pregnant women are more at risk because their bodies are coping with changes to their metabolism and circulatory system during pregnancy. Elderly individuals also face greater risk of contracting food poisoning because their immune system may not respond quickly to infectious organisms. Children are also considered at risk population because their immune systems are not developed as those of adults. Young children are more easily affected by dehydration from vomiting and diarrhoea.

**ENVIRONMENTAL SOURCES**

* Water- food borne diseases are also carried by contaminated water.
* Soil- dust and dirt is made up from soil. It is easily blown to food after being carried into the kitchen, on clothes and on shoes. Soil contains the food poisoning bacterium, Clostridium perfringens as well as many others.
* Insects- insects carry bacteria on their bodies. Crawling insects such as cockroaches, beetles and flies.
* Kitchen surfaces and utensils.

**TEN MAIN REASONS FOR OUTBREAK OF FOOD POISONING**

1. Food prepared too far in advance, and stored at warm temperature.
2. Cooling food too slowly prior to refrigeration.
3. Not reheating food to high enough temperatures to destroy food poisoning bacteria.
4. The use of cooked food contaminated with food poisoning bacteria.
5. Under cooking.
6. Not thawing frozen poultry and meat for sufficient length of time.
7. Cross-contamination from raw materials to cooked foods.
8. Storing hot foods below 63°C
9. Infected food handlers.
10. Use of leftovers.

**DIETS TO EAT WHEN YOU HAVE FOOD POISONING**

* Saltine crackers
* Gelatine
* Bananas
* Rice
* Oatmeal
* Chicken broth
* Bland potatoes
* Boiled vegetables
* Toast
* Soda without caffeine(ginger ale, root beer)
* Diluted fruit juices
* Sports drinks

**DIETS NOT TO CONSUME WHEN YOU HAVE FOOD POISONING**

* Dairy products especially milk and cheeses.
* Food with high sugar contents
* Spicy foods
* Fried foods
* Caffeine (soda, energy drinks)
* Alcohol
* Nicotine

**CONTROL MEASURES FOR FOOD POISONING**

* Cleaning- Maintain good basic hand hygiene, for example wash hands frequently with soap and water, especially before and after handling.
* Cooking- Cook food (especially meat) thoroughly, to ensure killing of bacteria (e.g listeria and salmonella).
* Chilling- Ensure correct storage of food in terms of temperature to prevent bacteria from multiplying and growing
* Try not to prepare food in advance
* Store foods at safe temperatures below 5°C to 63°C or above
* Keep raw and cooked foods separate
* Prevent dry foods from becoming moist
* Keep bins covered
* Dispose waste foods and other rubbish carefully
* Keep all animals and insects away from food places
* Keep everything as clean as possible
* Seek advise if you feel ill, especially if you are suffering from vomiting or diarrhoea

**CONCLUSION**

Some foods are likely to cause food poisoning because of the way they are prepared. Meat, poultry, eggs and shellfish if eaten in raw form and not cooked properly or if hands and surfaces are not cleaned after contact, food poisoning may occur. Always wash your hands before cooking or eating foods. Make sure that your food is properly sealed and stored. Make sure to always wash vegetables and fruits before serving.

Good food handling practices are the most important aspect of food hygiene. Get the practices right, keep them right and you should achieve food safety.

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