


Food poisoning causes and prevention and what to know about hygiene

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Article Info	ABSTRACT
<p>Article history:</p> <p>Received July 07, 2024 Revised July 26, 2024 Accepted July 27, 2024</p> <hr/> <p>Corresponding Author:</p> <p>Md Mamunur Roshed Department of Pharmacy, Jahangirnagar University, Dhaka- 1342, Bangladesh Email: mamunurpcy1971@gmail.com</p>	<p>Food-borne diseases are the most common health problems globally, and they are particularly common in Third World countries like India due to poor public sanitation and hygiene. Broadly speaking, food poisoning refers to any illness brought on by eating food that contains bacteria or non-bacterial substances. Stated differently, it's an acute instance of gastroenteritis caused by ingesting chemicals-contaminated food or drink, animal or plant-derived poisons, or living microbes and their toxins. Acute gastroenteritis is one of the leading causes of morbidity and mortality. The most vulnerable are newborns and young children. The clinical symptoms of a foodborne infection are determined by the pathogenic mechanisms that underlie it. The main symptoms are headache, nervousness, intense thirst, abrupt vomiting, diarrhea, colicky discomfort, cold, clammy skin, slow heartbeat, rigours, and cramps. The provision of clean, drinkable water, appropriate disposal of human and animal sewage with isolation from water supplies, and fundamental food hygiene standards are all very effective ways to prevent the development of these disorders.</p> <p>Keywords: <i>Food poisoning, Infections, Hygiene practice, Bacteria, Parasites, Acute gastroenteritis, Cleanliness, Food</i></p> <p>This article is licensed under a Creative Commons Attribution 4.0 International License.</p> <div style="text-align: center;"></div>

1. INTRODUCTION

A collection of symptoms known as food poisoning are brought on by eating food tainted with bacteria or the toxins these microorganisms create. Consuming food tainted with various viruses, bacteria, parasites, and hazardous substances can also lead to food poisoning; this includes sickness from eating mushrooms. If the illness's symptoms were to manifest in more than two persons, food poisoning is thought to have the potential to spread. Additionally, food poisoning is the major cause of food poisoning in over 80% of cases, as laboratory studies have shown that the bacteria that cause food poisoning are directly caused by the food that is consumed [1]. Foodborne infections are a sign that the body contains bacteria or other microorganisms that can infect the body after eating. Because food production and trade have become more globalized in recent years, there is a greater chance of food contamination [2-4].

Some foodborne disease outbreaks that used to be limited to a local town could now affect larger populations or possibly the entire globe. As a result, food and safety authorities around the world saw that the issue of food safety needed to be handled both locally and globally, with tighter links and collaborations between those agencies being established [5, 6]. This is necessary to convey regulatory information on food safety issues in addition to making data and information easier to acquire in the event of exposure to emergencies involving food safety. Although it is difficult to assess the incidence of foodborne illnesses worldwide, 2.1 million deaths from diarrheal infections are thought to have occurred in 2000; majority of these deaths are associated with contaminated food and water. Another important factor contributing to malnutrition in kids and teenagers is diarrhea.

According to estimates, over 30% of individuals in developed countries get a foodborne illness each year. An estimated 76 million food-borne disease cases are recorded annually, of which 325,000 are hospitalized for treatment and 5,000 are fatal [7]. However, developing countries are especially susceptible to foodborne illness risks due to the high contagiousness of illnesses, notably parasitic ones. Here, we draw attention to the serious and detrimental effects that food-borne illnesses have on society. In 1994, contaminated ice cream caused a salmonella outbreak in the United States that resulted in 224,000 cases of infection. A total of 300,000 persons contracted hepatitis. An outbreak that

happened in China in 1998 as a result of consuming infected mollusks. Therefore, communities affected by epidemics or illness outbreaks face intense social and economic strain as a result of food contamination [8].

The detrimental result that happens when a poisonous material is swallowed, inhaled, or comes into contact with the skin, eyes, or mucous membranes, like those in the mouth or nose, is known as poisoning. Prescription and over-the-counter medications, illegal drugs, gasses, chemicals, vitamins, food, mushrooms, plants, and animal poisons are examples of potential toxicants. While some poisons are harmless, others can be fatal or cause significant harm. The diagnosis is made using the patient's symptoms, information from the poisoned individual and others, and occasionally results from blood and urine testing. As a result, medications should always be stored out of children's reach in their original packaging [9, 10]. Prescription, over-the-counter, and illegal medicines are frequently the cause of fatal poisoning incidents (see aspirin and acetaminophen poisoning), as well as serious poisoning. A few more typical toxins are gases (like carbon monoxide), meals (especially some kinds of fish and mushrooms), agricultural goods, plants, heavy metals (including iron and lead), vitamins, and home items (see caustic poisoning). But nearly anything can be harmful if consumed in extremely high doses [11, 12].

Underlying Causes of food poisoning: Poisoning is the most common cause of non-fatal occurrences in homes. Young children and the elderly, who sometimes have confusion about their prescribed regimen, are especially prone to accidental poisoning in the house due to their inherent curiosity and inquisitive temperament. Given that children enjoy sharing CDs and other discoveries with their peers, siblings and playmates may also have been poisoned. The two populations most at risk of accidental poisoning are hospitalized patients (because to medication errors) and industrial workers (due to exposure to hazardous substances). Governments cannot completely resolve this issue by enacting laws, monitoring food processing facilities, and conducting routine inspections of individuals who manage food preparation [13]. In order to prevent the proliferation of bacteria, which often need moderate temperatures for growth, as well as paying attention to places of preparation in terms of sanitation, and general hygiene, as well as paying attention to workers in terms of education regarding food poisoning and physical hygiene, washing hands well after defecation, and keeping patients away from the preparation process, especially those Who complain of stomach flu. Not leaving foods exposed or exposed to insects or hot weather for long periods, using gloves when touching foods, getting rid of old foods on a daily basis, not mixing old foods with fresh ones, especially getting rid of foods that change their color, taste or smell, and a sense of responsibility towards consumers and not acting out of purely materialistic [14, 15].

Foodborne infections are often the result of inadequate handling, incorrect processing and preparation, and inadequate food storage. It should be mentioned that following proper hygiene procedures lowers the risk of contracting foodborne illnesses before, during, and after food processing. It is possible to weaken someone by poisoning them (for example, to rape or rob a person). Rarely, parents with a mental illness would poison their kids in an attempt to make them sick so they can get help (this condition is known as factitious disorder). The public health community generally acknowledges that one of the best ways to stop the spread of foodborne illnesses is to wash your hands often. Food safety is the movement to regulate and control food to make sure that it does not expose people to foodborne illnesses. This means that a wide range of environmental pollutants are the root cause of exposure to foodborne illnesses. See Food contamination for further details on diseases spread by chemicals. Pesticides and medications found in food can also cause foodborne illnesses, in addition to naturally occurring harmful compounds like reef fish or poisonous mushrooms [16, 17].

Apart from the production of cytotoxins, bacterial invasion and intestinal mucosal cell death can also result in dysentery. Shigella and entero-invasive E. coli infections cause mucosal epithelial cells to invade; intraepithelial multiplication and subsequent cell-to-cell spread ensue. The pathogenesis of many intestinal organisms includes the production of one or more exotoxins. These include enterotoxins, which directly impact the intestinal mucosa's secretory systems and induce watery diarrhea, neurotoxins, which directly damage the central or peripheral nervous system, and cytotoxins, which destroy mucosal cells and cause inflammatory diarrhea [18].

❖ Bacteria

- Bacillus cereus
- Staphylococcus aureus
- Salmonella group (except S. typhi)
- Shigella
- Vibrio
- Escherichia coli
- Campylobacter
- Yersinia enterocolitis
- Clostridium

❖ Viruses

- Rotavirus
- Adenovirus
- Parvovirus

❖ Protozoa

- Giardia lamblia
- ❖ Fungi
 - Aspergillus flavus
 - Fusarium roseum

Symptoms and features of food poisoning: The type of poison, the quantity used, the user's age, and their condition all affect the symptoms of poisoning. Certain poisons are not extremely potent and only become problematic when used frequently or in big quantities. A drop applied to the skin might produce significant symptoms in others due to its potency. Certain toxins produce symptoms in a matter of seconds, while others take hours, days, or even years to manifest symptoms. Certain poisons produce symptoms so blatant that they can occasionally cause lasting harm to important organs like the liver or kidneys. Because ingested and absorbed toxins frequently deprive the body's cells of oxygen or activate or block the action of enzymes and receptors, they produce symptoms throughout the body. Depending on which organs are impacted, symptoms can include altered respiration, heart rate, body temperature, and consciousness, among other symptoms. Caustic or irritating materials Affected mucosal surfaces of the mouth, throat, lungs, and digestive system can result in discomfort, coughing, vomiting, and dyspnea [19]. Toxin exposure on the skin can result in a number of symptoms, including blisters, rashes, and pain. Prolonged contact to pollutants can also result in inflammation of the skin. Toxin exposure to the eyes can harm them, resulting in pain, redness, and blurred vision [20].

Treatment and prevention: In the home, prevention is mainly food safety practices. Many forms of bacterial food poisoning can be prevented, even if the food has been contaminated, by adequately cooking the food, and either eating it directly and quickly, or freezing it effectively. However, despite this, many toxins remain indestructible even with heat treatments. In the post-war period that occurred in Aberdeen, Scotland in 1964, there was an outbreak of widespread infection (>400 cases) of typhoid, and this was due to contaminated preserved meat imported from Argentina. Where the preserved meat was packed into cans and due to the failure of the refrigeration plant, frozen river water at the mouth of the Río de la Plata was used to freeze and cool the cans in which the meat was preserved. However, one of the boxes had defects in it, which resulted in contamination of the meat kept inside [21]. Food poisoning can be avoided with proper frozen food storage. Government regulation of health and public services for veterinary surveys of animal products in the food chain, from the agricultural sector to manufacturing and shipping goods to supermarkets and restaurants, is frequently the first step in prevention.

Wash hands, utensils, counters, and cutting surfaces with water and soap between preparation of different foods (especially in the case of raw meat, poultry, or fish). Use plastic or glass cutting boards for slicing vegetables or meat. Wooden boards are extremely difficult to clean adequately. Wash fresh fruits and vegetables under running water. Avoid consuming uncooked animal-derived dishes (sushi, raw oysters, eggnog, mayonnaise, etc).

Make sure all meat and fish are properly cooked before consuming them. Never consume undercooked clams, oysters, sushi, mussels, or snails. Ensure that the freezer's temperature never drops below -18°C and that the main refrigerator section's temperature never rises over 4°C. Cook eggs through to the yolk and white are set. Never eat runny yolks. Vegetables or meats should never be left outside. Place them in the refrigerator or cook them.

2. METHOD

Research Design

This study uses a descriptive qualitative approach to understand the causes of food poisoning, prevention measures, and the importance of hygiene in the context of public health. The descriptive qualitative approach is chosen as it allows for an in-depth exploration of experiences, perceptions, and hygiene practices of individuals and groups.

Subjects of the Study

The subjects of this study are individuals who have experienced food poisoning and health and sanitation experts with extensive knowledge of hygiene practices and prevention of foodborne diseases. Subjects are selected using purposive sampling to ensure representation from various backgrounds and experiences.

Data Collection

Data is collected through in-depth interviews, observations, and document analysis. Interviews are conducted with individuals who have experienced food poisoning and health experts to gain insights into the causes of food poisoning, symptoms experienced, and preventive measures taken. Observations are carried out in places where food poisoning frequently occurs, such as restaurants, traditional markets, and households. Document analysis involves reviewing relevant literature and health reports from related institutions.

Data Analysis

The data collected is analyzed using thematic analysis. The stages of analysis include:

1. Transcription of interviews and observation notes.
2. Reading and understanding the transcripts to identify main themes.
3. Coding data based on emerging themes.
4. Organizing themes into broader categories to find patterns and relationships between themes.
5. Compiling the analysis report by presenting the main findings and their interpretations.

3. RESULTS AND DISCUSSION

Personal hygiene: Maintaining good personal and household hygiene can also serve as a preventative measure against impending diseases. Thus, maintaining good hygiene is essential to reducing the spread of infections in daily life. One of the most important strategies for preventing the spread of infectious diseases is probably washing your hands with soap [22, 23]. In light of the fact that maintaining good personal hygiene is crucial for warding off bacteria that may cause sickness and an unpleasant odor.

Hand washing: Another term for hand hygiene is hand washing. It involves washing one's hands with soap and water to get rid of any germs, viruses, or other undesirable materials that may have adhered to the skin. Our hands are the ideal place to start when considering personal hygiene. Humans use their hands all the time for eating, drinking, playing, welcoming others, and typing at work. Thus, hands are the primary sites of infection. Ensuring that everyone maintains proper hand hygiene is one of the simplest and fastest ways to avoid illnesses like the flu, gastroenteritis, colds, and coughs, which may be spread by unclean hands. The primary strategy for halting or preventing the spread of the possible disease-causing.

Cleanliness of clothes: Dirt and bacteria might accumulate on the clothing as well. Taking care of your clothing by washing and changing them on a regular basis is an essential aspect of maintaining good personal hygiene, especially if a family member is ill. Try adding antiseptic solutions to the laundry to destroy any bacteria and ensure that the clothing is clean and sanitary. This will make the laundry neat and clean. The most crucial habit to maintain your health is maintaining good personal cleanliness. Setting a good example for children and society at large is crucial in encouraging them to take care of their own personal hygiene, since it becomes an activity once a person adopts a decent routine [24].

Hygiene in children: Being clean is first and foremost a prerequisite for social functioning. Secondly, cleanliness allows one to maintain a hygienic environment that may not be entirely germ-free but is largely free of hazardous germs. Personal hygiene includes a variety of actions that keep germs, viruses, and fungi away from the body, such as washing your hands and brushing your teeth. These actions support the preservation of mental health and function. Maintaining proper personal hygiene will also help you feel nice. In the meanwhile, those who neglect their personal hygiene—resulting in unpleasant body odor, unclean clothes, and foul breath—face prejudice, which mostly causes mental health issues. It's important to wash one's hands before handling food, after using the restroom, and after cleaning a kid. The measurements that are assumed to be on the causal path to the behavior are knowledge, attitudes, and beliefs. For children, poor personal hygiene practices, attitudes, and knowledge have long-term negative effects on their general development. Being aware of the health implications of good behavior is important since it determines how long a sanitation intervention will last. The ideas and behaviors of hand washing are significantly impacted by awareness [25].

3.1. CONCLUSION

Food-related intoxications are currently the most common public health problem worldwide. A food poisoning incident will cost a lot of money and could possibly force a company to close, declare bankruptcy, or result in job losses. For a number of reasons, including the ill person's inadequate response to medical authorities, the illness's inaccurate diagnosis, poor sample collection for laboratory analysis, and improper laboratory evaluation, the true prevalence of food-borne illnesses remains unknown. Therefore, strict laws pertaining to food safety must be implemented. These rules are enforced by officials in charge of food safety and environmental health. Food inspectors are always free to inspect any area where food is being processed. Once the meal has been examined, samples can be taken out for testing.

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