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Clinical and Epidemiological Aspects of Food Poisoning and the Relevance of Improving Measures to combat it

Durdona Bobomurodova Shakhob kizi [1]

Dilnavoz Nematjonova Bakhriddin kizi [2]

Ulugbek Abdullayev [3]

Abstract: Globally, food poisoning is still a serious and avoidable public health issue. Although viruses, parasites, and chemical toxins also have a role, bacterial infection accounts for the bulk of cases. The danger is particularly significant when food safety measures—such as adequate cooking, refrigeration, sanitation, and prevention of crosscontamination—are lacking. The need for ongoing monitoring and proactive action is highlighted by epidemiological evidence that shows changing patterns in causative agents and contributory factors. Effective prevention involves coordinated tactics across the entire food supply chain, effective regulatory frameworks, and informed consumer behavior. Public health initiatives should focus food hygiene education, increase outbreak surveillance and response, and encourage safe food handling practices at all stages from production to consumption. Authors created a specific database to improve FBDO surveillance and analysis in Jinhua. This database systematically collects data on FBDOs, including demographics, clinical symptoms, probable food vehicles, and test results. Analyzing outbreak trends, identifying risk factors, and directing public health policy are the main goals. This study makes use of the recently created database to provide a more thorough examination of FBDOs, building on our previous findings on individual FBD instances. Improving precautions against food poisoning is vital to prevent a frequent but potentially serious sickness that can include symptoms including nausea, vomiting, diarrhea, and fever. The relevance lies in protecting vulnerable populations, minimizing the risk of consequences such as severe dehydration, and preventing illness outbreaks in the community. Key improvement measures focus on the four C's of food safety: cleaning, separating, cooking, and chilling.

Keywords: Outbreaks of foodborne illness, epidemiology, financial burden, food safety, risk factors, pathogenic variables

[1,2] Students of the 2nd Course, General Medicine, Group 209-B of the Tashkent State Medical University

[3] Scientific Supervisor, Tashkent State Medical University

Introduction. Poisoning is a worldwide public health hazard that is recognized as one of the most dangerous medical contingencies because its multitude differs from one region to another. Poisoning is widely regarded as a health exacerbation induced by the admittance of a contaminant (microorganism or aberrant material) at varied concentrations into the body, whether it be food, chemicals, or even pharmaceuticals in different forms. According to the World Health Organization, human poisoning is a major clinical problem around the world. Many people are growing reconciled with the incidence of poisoning instances, unaware of the magnitude of the danger that it may create, as it may result in death if not considered. Poisoning incidents are predicted to cause more than one million illnesses per year, with the amount differing, accordingly, depending on deliberate instances related with approved or unapproved chemicals. The clinical indicators and effects of poisoning might differ among individuals, depending on an array of variables such as age, sex, environment, immunological response, chronic disease, and psychological and social stress [1,2,3,]. Foodborne disease outbreaks (FBDOs) pose a significant hazard to public health globally, resulting to severe morbidity, mortality, and economic losses. However, in some areas, the underlying causes and effects of FBDOs are frequently still poorly understood, which reduces the efficacy of focused preventative measures. A foodborne sickness, sometimes known as food poisoning, is an ailment brought on by consuming food or water tainted by bacteria, their toxins, viruses, parasites, or chemicals. Its clinical manifestations range from moderate gastrointestinal distress to life-threatening consequences such as haemolytic-uraemic syndrome or neurologic involvement. The prevalence of food poisoning continues to be a major worry for public health authorities worldwide due to the globalization of food production, the complexity of supply chains, and changing consumer preferences. Poisoning hazards have increased globally, especially in Saudi Arabia, because to the substantial growth of the agricultural, chemical, and pharmaceutical industries during the past few decades. Food poisoning, often known as foodborne sickness, is caused by the intake of infected or unhealthy foods. Food poisoning outbreaks are associated with catering services, regardless of whether the food is eaten right away or bought to eat later [4,5,6,7]. Acute contamination occurs when food is contaminated by microorganisms that increase toxicosis. Salmonella and E. coli have been identified to be among the most important bacteria that have recently become increasingly frequent causing poisoning, particularly in youngsters. The consumption of two or more medications was defined as a mixed drug. If no suspected hazardous substance was mentioned in the patient's history, the toxic agent was classed as unknown. In the event of food poisoning, the type of exposure is characterized as food contamination by various bacteria at home, restaurants, or weddings. Suicidal, accidental, and unknown drug and chemical toxicity were classed as follows: Suicidal exposure arising from the inappropriate use of medicines for self-destruction. Abuse was described as exposure resulting from deliberate, inappropriate, or wrong drug usage, when the victim was probably trying to get a euphoric or psychotropic impact. This study's research question is based on tackling these complex issues. In particular, this study attempts to measure the economic and epidemiologic cost of FBDOs in Jinhua, offering data to inform public health initiatives [8,9,10]. The years 2018 to 2022 were chosen as the study period to capture recent developments, as these years involve major changes in food consumption habits and the adoption of new public health surveillance systems. Additionally, this time span guarantees that the study encompasses seasonal, yearly, and pandemic-related fluctuations in FBDOs, providing for a full analysis. The accuracy of data gathered from individual cases is one of the fundamental limitations of foodborne disease research. Individual case reports may lack detailed and reliable information due to recollection bias or insufficient data collection, resulting to potential mistakes in identifying causal agents or risk factors. To reduce these biases, our work focuses on assessing risk variables linked with foodborne illness outbreaks (FBDOs), as outbreaks often provide a stronger relationship between exposures and outcomes. This method makes it possible to identify risk variables more precisely and to implement focused public health interventions [11,12,13,14].

The main purpose of the presented manuscript is to conduct a brief analysis based on reputable scientific papers on the clinical and epidemiological aspects of food poisoning and the relevance of

improving measures to combat it.

Epidemiology. Thirty percent of newly emerging infectious disorders throughout the previous sixty years were linked to food-borne pathogens. The World Health Organization (WHO) projected in 2015 that 31 foodborne hazards contributed to 600 million foodborne disease cases and 420,000 fatalities in 2010. The worldwide burden of these FBD cases in 2010 was 33 million healthy life years (DALYs). Another study also produced the same estimate that 1 out of 10 people (approximately 600 million people) get sick and 420,000 fatalities occur due to contaminated food every year, resulting in the loss of 33 million DALYs globally. 3,895,914 FBD cases and NT$1. billion in medical expenses were reported in Taiwan between 2012 and 2015. France had 1.28–2.23 million FBD cases between 2008 and 2013, which led to 16,500–20,800 hospital admissions and 250 fatalities from 15 primary pathogens. As reported by the United States Centres for Disease Control and Prevention (CDC), 76 million instances of FBD, 325,000 hospitalizations, and 5200 fatalities occur annually in the United States.Ten In England and Wales, 2,366,000 cases, 21,138 hospitalizations, and 718 deaths were connected with FBD each year [3-11].

The symptoms of food poisoning, which frequently mirror the stomach flu, include nausea, vomiting, diarrhea, cramping in the abdomen, and fever. In order to avoid dehydration, the mainstay of treatment is fluid replacement; severe cases may necessitate hospitalization or intravenous fluids. Improving strategies to battle it are vital since they can avert these symptoms, hospitalizations, and even fatalities, especially in high-risk patients like the elderly or immunocompromised. Symptoms: Common symptoms include nausea, vomiting, watery or bloody diarrhea, stomach pain, and fever. After eating tainted food, symptoms may appear hours, days, or even weeks later. Dehydration: Fluid loss is caused by vomiting and diarrhea. Excessive thirst, dry mouth, little or no urination, and dizziness are symptoms of dehydration. Severity: While most cases resolve on their own, some can be severe or even fatal [4-11]. Children, the elderly, and people with compromised immune systems are particularly vulnerable to serious consequences. Improving precautions against food poisoning is vital to prevent a frequent but potentially serious sickness that can include symptoms including nausea, vomiting, diarrhea, and fever. The relevance lies in protecting vulnerable populations, minimizing the risk of consequences such as severe dehydration, and preventing illness outbreaks in the community. Key improvement measures focus on the four C's of food safety: cleaning, separating, cooking, and chilling [14,15].

Treatment. Food poisoning is prevented and treated by emphasizing good cleanliness, handling food safely, and drinking plenty of water. Improving procedures include regular handwashing, appropriate separation of raw and cooked meals to prevent cross-contamination, cooking foods to their correct temperatures, and cooling leftovers promptly. Treatment entails avoiding fatty, spicy, or acidic foods, drinking lots of water to prevent dehydration, resting, and eating small, bland meals when you feel like it. Food poisoning usually goes away on its own without the need for special care. Treatments try to preserve the balance of fluids and electrolytes lost during diarrhea and vomiting. Replacing lost fluids and electrolytes with oral electrolyte solutions will gradually improve and resolve the symptoms within 3-5 days [5-9]. Intravenous (IV) fluids may be used to replenish lost fluids and electrolytes that cannot be rehydrated in time with an oral electrolyte solution, therefore if patients exhibit the previously described danger signals, please seek emergency medical assistance. Patients with invasive infection symptoms, such as elevated temperature, mucous-bloody diarrhea, and fecal white blood cells, benefit from antibiotics. To alleviate the symptoms, additional drugs such antidiarrheal, antispasmodic, or antiemetic medicines might be administered. Antidiarrheal medications should be taken with caution, though, especially in children or individuals with inflammatory diarrhea [18,19,20].

Enhancing preventative strategies. Clean: Wash hands thoroughly with soap and water before, during, and after handling food. Clean and sanitize all surfaces, utensils, and cutting boards after preparing raw meats, poultry, seafood, and eggs.apart: Keep raw meat, poultry, shellfish, and eggs apart from other foods throughout purchase, storage, and preparation to prevent cross-contamination. Store raw foods on the bottom shelf of the refrigerator so their juices cannot drip onto other foods. Cook: To make sure food is cooked to a safe internal temperature, use a food thermometer.Chill: Within two hours of cooking,

place perishable goods in the refrigerator and set the temperature to −5^{\circ }C\) (\(41^{\circ }F)) or lower. Foods that are cold or frozen should not be left out of the freezer for long [6,8,9]. ***Therapy and recuperation.*** Hydrate: Drink plenty of fluids such water, clear broths, or oral rehydration treatments, especially if you have vomiting or diarrhea, to prevent dehydration. Sip tiny quantities if you feel nauseated. Rest: To give your body time to heal, stay at home and take it easy. Eat light: Once you feel able, start with tiny, bland foods like toast, rice, or crackers. Steer clear of alcohol, coffee, and foods that are fatty, spicy, or acidic as these can exacerbate symptoms.Monitor: According to the Cleveland Clinic and Medscape eMedicine, get medical help if your symptoms are severe, persistent, or if you exhibit symptoms of severe dehydration [15-20].

Discussion. One of the biggest challenges addressing public health in our nation is poisoning. To start preventive measures, information about the kind and severity of poisoning is needed. Poisoning continues to constitute a substantial and expanding hazard to public health worldwide, considerably contributing to hospital admissions, morbidity, and mortality. The prevalence of food poisoning varies from city to city and from area to area. Food poisoning is a considerable factor to both short- and long-term morbidity; it also adds to both overt and covert morbidity. The results emphasize vulnerable groups and high-risk foods, highlighting the substantial effects of FBDOs on public health and the economy. Improved surveillance systems, the creation of regional laboratory facilities, and the use of new diagnostic technologies are essential to addressing these issues. Collaborative efforts among governments, the food sector, and consumers are crucial to increasing food safety and decreasing the burden of foodborne infections. Ingested toxins can be classified as mild, moderate, or extremely toxic foods, medicinal products, and plant product derivatives. One of the most common reasons for hospital admissions and fatalities is acute poisoning. Food poisoning, also known as microbiological foodborne sickness, is a widespread occurrence worldwide including Saudi Arabia [1,4,5,6]. Thankfully, most people recover from episodes of foodborne illness without the need for medical care or long-term repercussions. Numerous microorganisms can cause foodborne illness. Additionally, we noticed that the frequency of psychiatric medication poisoning has grown, indicating that mental illness may contribute to poisoning occurrences and that it is vital to pay attention to this. Surprisingly, there weren't many opioid poisonings in our study. This is because opioids are strictly regulated and doctors and patients don't know enough about them (for example, they worry too much about addiction and side effects), which makes opioid use rare. Our study's primary drawback is that it was retrospective, which meant that patient data was absent [11-16]. Another problem is that, while having three branches, the statistics from a single teaching hospital may not adequately represent the realities in this area. As a result, comprehensive data collection and analysis from nearby general hospitals may more accurately depict regional poisoning patterns. Additionally, the absence of data consistency rendered comparison between the two research problematic. Improving precautions against food poisoning is vital to prevent a frequent but potentially serious sickness that can include symptoms including nausea, vomiting, diarrhea, and fever. The relevance lies in protecting vulnerable populations, minimizing the risk of consequences such as severe dehydration, and preventing illness outbreaks in the community. Key improvement measures focus on the four C's of food safety: cleaning, separating, cooking, and chilling [17-20].

Conclusions. In more study provides a detailed analysis of the epidemiological characteristics of FBDOs within the specific context of a hospital-based setting. Unlike general studies that often discuss FBDOs in broader or regional terms, our research focuses on understanding the patterns of disease transmission and the contributing factors specific to this hospital. The findings underscore the crucial role of infection control measures and emphasize the need for improved surveillance systems within healthcare institutions to better manage and reduce foodborne outbreaks. Moreover, the study contributes to a greater knowledge of how hospital-related factors, such as food handling methods and patient demographics, influence the development of foodborne infections. These observations have crucial implications for creating tailored methods to prevent and regulate FBDOs in hospital environments.

More funding is required to support public health education on the sensible use and safe storage of

hazardous chemicals as well as self-defense in order to lessen acute poisoning. Psychiatric assistance should be sought as soon as possible by patients who attempt suicide. Early psychiatric identification and consultation may lower the likelihood of additional self-harm in suicide patients. In general, given the high toxicity of pesticides, pertinent laws and regulations should be created and put into effect as quickly as feasible to restrict access to harmful substances. Furthermore, to prevent the high occurrences of poisoning among children and adolescents, parental awareness should be improved, and educational programs should be made available to the general public.

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