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Food poisoning outbreak in prisoners

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Abstract

Background: An outbreak of food poisoning was investigated in a prison in AL-Muradia area in Diyala in June 23, after poisoning cases was reported to the primary health care center of the area on June 22, 2022.
Objective: To determine the cause of food poisoning outbreak among the inmates.
Patients and Methods: A retrospective cohort study was conducted in a prison in AL-Muradia area in Diyala in June 23 and the data has been collected using a questionnaire developed by the researcher and filled out by direct interview with all individuals who attended meals, all person in that prison were interviewed and traced back every meal served in the last two days before the investigation.
Results: All people who had interviewed, (12) reported to have a common meal in afternoon of 21-June 2022, with age mean of 33.5+_ 6 SD. (5) of them met the probable case definition of food poisoning, and the first two cases had the onset of symptoms within 12hr. of the exposure, the last case experienced a symptom was after 24 hr., all cases had fever and headache followed by diarrhea (80%), nausea and abdominal pain (60%) and vomiting (40%). The meal items were canned meat, canned tuna, grilled chicken, apricot, plum and yogurt, the highest relative risk was for tuna (RR=4) with risk difference of (50%)
Conclusion: The food item responsible for the outbreak was canned tuna. Based on the incubation period, symptoms and the unhealthy storage of food suggested that canned tuna could be contaminated with salmonella spp.
Keywords: Outbreak, food poisoning, Diyala, prison

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Introduction

Food poisoning (FP) is a group of disease symptoms caused by bacteria and toxins produced by these organisms, as well as food poisoning caused by various types of viruses, germs, parasites, and chemicals, or as a result of eating certain types of mushrooms. Food poisoning is considered an outbreak if symptoms appear in more than one person, as laboratory studies have confirmed that food poisoning with bacteria accounts for 80% of poisoning cases. It should be noted that foodborne illnesses are also commonly known as (food poisoning) [1].

Poisoning can occur in a small or large group, and whatever the poisoning is, it must be dealt with because the issue concerns food safety, and all authorities around the world agree on this.

Furthermore, food safety should not be addressed only at the local level; it should be

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addressed at both the local and international levels [2.3].

According to the World Health Organization, food-borne diseases (FBDs) are "diseases of an infectious or toxic nature caused by, or thought to be caused by, the consumption of food or water." There have been described more than 250 FBDs. Depending on the etiological agents, the symptoms can vary greatly. The most typical symptoms are diarrhea and vomiting. When it comes to FBDs, food-borne infections are brought on by a variety of disease-causing pathogens that can contaminate food, whereas food-borne poisoning is brought on by noxious chemicals or other dangerous substances that are present in food. National health care organizations in many nations keep track of FBD outbreaks, which are defined as the occurrence of two or more cases of a similar illness brought on by consuming a common food [4].

Given that one million people died from diarrheal disease in 2000 and that many illnesses are caused by tainted food and water, it is challenging to quantify the global incidence of foodborne diseases. There are 5,000 reported deaths per year in addition to an estimated 76 million cases of foodborne illnesses. The risk is greater and more pervasive in developing nations for a variety of reasons [5].

Diseases brought on by tainted food pose a continuing threat to public health and pose a significant barrier to socioeconomic development globally. FBD outbreaks are frequent and frequently result in significant morbidity and mortality. These illnesses could be brought on by infectious agents, like the Escherichia coli O104:H4 outbreak linked to tainted fenugreek sprouts in Germany in 2011 [6], which resulted in 386 cases of illness and 54 fatalities. They can also be brought on by chemical contamination, such as the melamine contamination of infant milk formula in China in 2008 that led to at least 6 fatalities and 294,000 cases of illness [7].

There are numerous actual instances of food poisoning, the most well-known of which is the salmonella outbreak in America in 1991 brought on by tainted ice cream, which affected 224,000 people, as well as the hepatitis virus outbreak in China in 1995, which infected 300 individuals [8].

Infected populations may experience significant social and economic burden due to food contamination. There are 12 different species of bacteria known to cause food poisoning, and they are as follows: Salmonella spp., Staph aureus, Vibrio species, Bacillus cereus, Clostridium perfrigins, etc. Clostridium botulinum Shigella. E. coli that is toxic. Listeria, Campylobacter, Yersinia, and Aeromonas [9].

In Iraq, food poisoning is a common occurrence, yet investigations and documentation are typically infrequent or unreported. Disease outbreaks have happened recently in camps, jails, and other locations, but regrettably, the majority of them have not received adequate investigation or publication [10].

In Diyala, an outbreak of food poisoning was investigated in a prison in AL-Muradia area in June 23, after poisoning cases were reported to the primary health care center of the area on June 22, 2022.

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Aims of the study is the investigation was caried out to determine the cause of food poisoning outbreak among the inmates.

Patients and Methods

Study Design

A retrospective cohort study was conducted to investigate an outbreak of food poisoning in a prison in AL-Muradia area in Diyala province in June 23–2022, and the number of people included in the study was 12 males, after receiving a report of poisoning cases they had signs and symptoms from the primary health care center of AL-Muradia on June 22, 2022, and after obtaining the approval of the health care center's administration and the communicable diseases unit chief at the health care center, as well as the approval of the police station director, to find out and control the problem.

Case Definition

A probable food poisoning case was defined as any person in that prison who ate a meal within the 48hr. prior to investigation that had diarrhea (loose stools within 24 hours), vomiting, or abdominal cramps with fever.

Data Collection

A questionnaire was developed by the researcher and filled out by direct interview with all individuals who attended meals, which included Age, date of exposure, date of onset of signs and symptoms, treatment, and outcome), as well as the foods consumed at that time, all person in that prison were interviewed and traced back every meal served in the last two days before the investigation.

Statistical Analysis

The programs used for analyzing the data were Microsoft Excel version 2019 and Epi Info.

Results

All people who had interviewed, (12) prisoners reported to have a common meal in afternoon of 21-June 2022, with age mean of 33.5+_ 6 SD. (5) of them met the probable case definition of food poisoning, and the first two cases had the onset of symptoms within 12hr. of the exposure, the last case experienced a symptom was after 24 hr. as shown in Figure (1), Fever and headache are the common symptoms among the cases while least common symptom was vomiting Figure (2). The meal items are canned meat, canned tuna, grilled chicken, apricot, plum and yogurt, and the relative risk of items shown in Table (1).

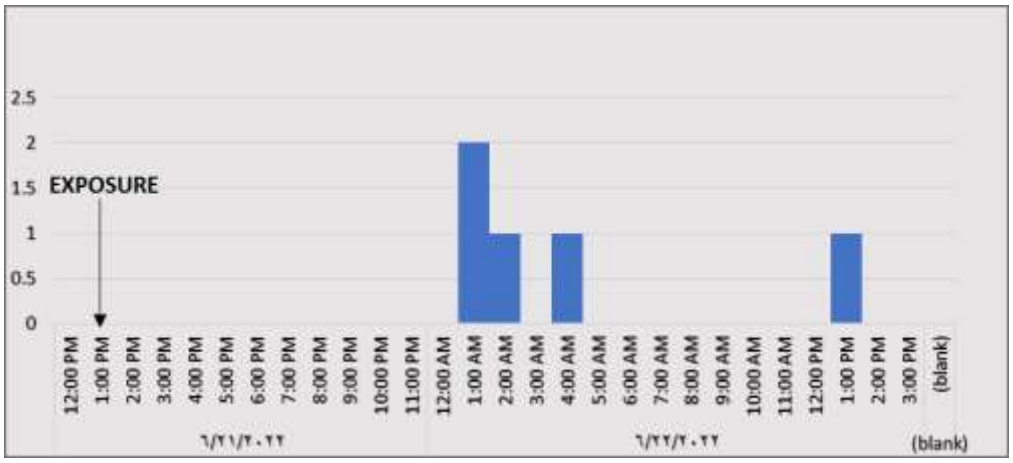

Figure (1): Timeline of exposure and onset of symptoms for all cases

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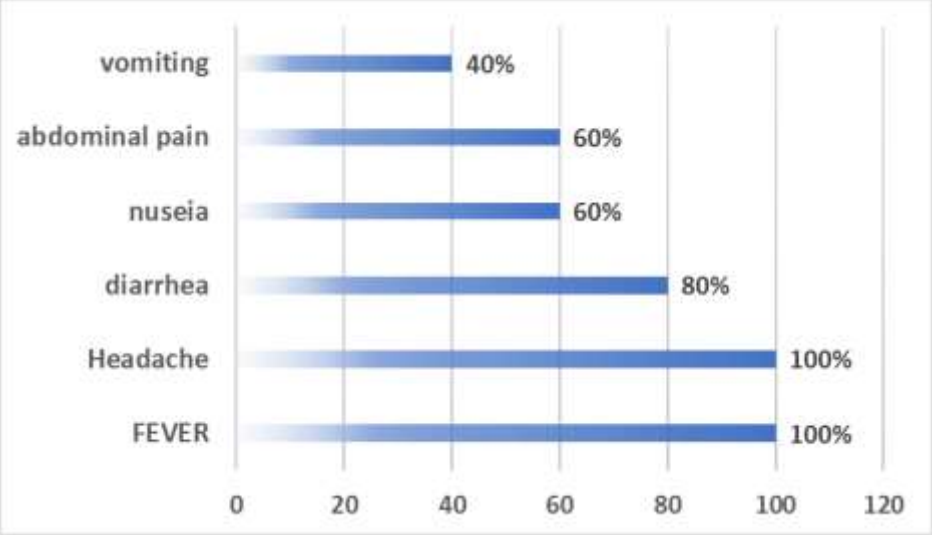

Figure(2): percentage of signs and symptoms among cases

Table (1): Relative Risk of the items served in the lunch

	people who Ate food		people Who did not eat		RELATIVE RISK	confidence interval	
food	Sick	well	sick	well	RR	lower	upper
canned meat	3	2	2	5	2.1	0.53	8.2
tuna	4	2	1	5	4	0.6	26,1
chicken	3	6	3	1	0.44	0.15	1,31
apricot	2	2	3	5	1.3	0.35	5.02
plum	1	5	4	2	0.25	0.03	1.63
Yogurt	2	4	3	3	0.66	0.16	2.66

Discussion

Food poisoning outbreak was reported in Diyala, in 5 inmates who had common meal, which was a lunch served in 21st of June, 2022. The incriminating food item was canned tuna, which had the highest statistically significant Relative Risk (RR) followed by canned meat this may be compatible with a study has been done in USA by CDC in 2008 articulate that beef, fish, and poultry consistently ranked among the products most frequently linked to outbreaks [11].

The present results agrees with other studies done in USA 2000, 2001 presented that the most typical carriers of Clostridium perfringens type A food poisoning are meat and meat products. This pathogen may enter the food supply through the contamination of meat with the intestines of slaughtered animals [12, 13].

It is in the same way the results in agreement _with other study done in United States, 2009–2010, _in which showed that 48% of the 766 outbreaks with a single known location of food consumption were

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triggered by eating in a restaurant or deli, and 21% were triggered by eating in a private residence. Recalls of products were made in response to 43 outbreaks. Ground beef was recalled due to eight outbreaks, followed by sprouts (seven), cheese and cheese-containing products (six), oysters (five), raw milk (three), eggs (three), salami (ground pepper), bison, sirloin steak, unpasteurized apple cider, cookie dough, frozen fruit, hazelnuts, Romaine lettuce, ground turkey burger, tuna steak, and a frozen entree (one each) [14].

The clinic-epidemiological profile of this outbreak gives hints to it causes. Mostly fever with diarrhea with or without abdominal cramps is a symptoms of Salmonella spp., staphylococcus aureus, clostridium perfringens, this result agrees with other studies done in Iraq [10] 2013,~ and ~ in India [15] 2011 _and _agrees with study done in USA 2009- 2010 showed that Salmonella caused the most outbreak-related hospitalizations [14].

And agrees with a study published in Annals of Allergy, Asthma & Immunology is a scholarly medical journal 2022 [16].

Also agrees with other study done in Najaf, Iraq 2021, represented that Food poisoning symptoms, which can appear hours after consuming tainted food, frequently include nausea, vomiting, and diarrhea. Food poisoning frequently has mild symptoms and goes away on its own. However, some patients require hospitalization [17].

In this investigation, the cases occurred within 12-24 hr. with a mid-incubation period of 18 hr., Incubation period such as this, is seen in food poisoning caused by salmonella spp., clostridium spp. Norovirus mentioned in CDC guideline to confirms diagnosis of foodborne disease gives differential diagnosis for such outbreaks [18].

Conclusions

Based on the storage period, symptoms and the unhealthy storage of food suggested that canned tuna could be contaminated with salmonella spp.

Recommendations

Maintaining health control over food served in prisons and conducting periodic checks on food preparation workers.

Source of funding: The current study was funded by our charges with no any other funding sources elsewhere.

Ethical clearance: Ethical and official approvals have been obtained from the prisoners, administration of the police department and the health care center management.

Conflict of interest: Nil

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تفشي التسمم الغذائي بين السجناء

مازن خالد عبدالله[١] ، مروة قادر سلمان[٢] ، ابراهيم محمود رجب[٣]

الملخص

خلفية الدراسة: تم التحقيق في تفشي حالة تسمم غذائي في أحد سجون منطقة المرادية في ديالى في ٢٣ حزيران ٢٠٢٢، بعد إبلاغ مركز الرعاية الصحية الأولية في المنطقة بحالات تسمم بتاريخ ٢٢ حزيران ٢٠٢٢، وتم إجراء التحقيق لمعرفة السبب.

اهداف الدراسة: لمعرفة اسباب التفشي بين النزلاء في السجن.

المرضى والطرائق: أجريت دراسة الأفواج الرجعة في أحد سجون منطقة المرادية في ديالى في ٢٣ حزيران وتم جمع البيانات باستخدام استبيان تم تطويره من قبل الباحث وتم ملؤه عن طريق المقابلة المباشرة مع جميع الأفراد الذين حضروا وجبات الطعام، جميع الأشخاص في ذلك السجن تمت مقابلتهم وتتبع كل وجبة تم تقديمها في اليومين الأخيرين قبل التحقيق.

النتائج: أفاد جميع الأشخاص الذين تمت مقابلتهم (١٢) أنهم تناولوا وجبة مشتركة بعد ظهر يوم ٢١-يونيو ٢٠٢٢، بمتوسط عمر ٣٣,٥+_ ٦ 5) .SD) منهم استوفوا تعريف الحالة المحتملة للتسمم الغذائي، والحالتين الأوليين ظهرت عليهما الأعراض خلال ١٢ ساعة. من فترة التعرض، كانت آخر حالة ظهرت عليها الأعراض بعد ٢٤ ساعة، وكانت جميع الحالات تعاني من الحمى والصداع يليها إسهال (٨٠٪)، غثيان وآلام في البطن (٦٠٪) وقيء (٤٠٪). كانت عناصر الوجبة هي اللحوم المعلبة والتونة المعلبة والدجاج المشوي والمشمش والبرقوق والزبادي، وكان أعلى خطر نسبي للتونة (RR = 4) مع فرق خطر قدره (٥٠٪).

الاستنتاجات: وكانت المادة الغذائية المسؤولة عن تفشي المرض هي التونة المعلبة. بناءً على فترة الحضانة، تشير الأعراض والتخزين غير الصحي للأغذية إلى أن التونة المعلبة يمكن أن تكون ملوثة بالسالمونيلا.

الكلمات المفتاحية: تفشي، تسمم غذائي ، ديالى ، سجن

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