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Cholera outbreak in diyala province

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Abstract

Background: Vibrio cholerae is a primary cause of severe dehydrating diarrhea and remains a serious public health problem in low- and middle-income countries (LMICs) with insufficient water, sanitation, and hygiene. Cholera remains a public health threat the worldwide, mainly in countries with poor access to safe water and sanitation facilities. According to estimates, there are 21,000–143,000 deaths and 1.3–4 million cases of cholera annual.

Objective: This study aims to carry out an analysis of the available information on cholera outbreaks in Diyala province, 2022.

Patients and Methods: A descriptive study conducted in the department of public health using the data of cases reported from eight sectors in province. The data was collected from the surveillance unit, communicable control division of the public health department in Diyala province, IRAQ in 2022.

Results: The total number of confirmed cases of cholera was (n = 139), female (72) 52 % and male (67) 48%, death reported for two of these cases. According to the date of onset, the registration of cases began from July 19 to October 25, 2022. However, the case fatality ratio (CFR) was 1.4%, while the attack rate in the governorate is 7.6 per 100,000 populations during 2022, the highest attack rate in Khanaqin district was (77 cases) 46, while the lowest attack rate in Baldruze, Al-Mansuria, and Al-Khalis districts was (1 case) 0.3,0.6, and 0.8 respectively. The age mean of patients was (38.7 ± 17.14 years) and the occurrence of the disease is more incidence in the age group 30-44 and females more than males.

Conclusion: Occurrence Cholera outbreak during year 2022 without confirmed cases recorded since 2015 and the occurrence of cholera cases in governorate is greater during the months of August and September and most of the cases were from Khanaqin district.

Keywords: Outbreak, Cholera, Iraq, Diyala, CFR.

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Introduction

Vibrio cholerae is a primary cause of severe dehydrating diarrhea and remains a serious public health problem in low- and middle-income countries (LMICs) with insufficient water, sanitation, and hygiene (1). V. cholerae is disseminated by two different fecal-oral mechanisms: the first is direct transmission from person to person through the consumption of food or water infected with bacteria, and the second is drinking water from ponds, lakes, or rivers that has been contaminated on an environmental level (2).

Cholera remains a public health threat the worldwide, mainly in countries with poor access to safe water and sanitation facilities. (3). According to estimates, there are 21,000–143,000 deaths and 1.3–4 million cases of cholera annual (4). In 2020, 80 countries reported statistics on cholera to world health organization (WHO). Of them, 27 countries reported a total of 323,320 cholera cases and 857 deaths, 0.27% case fatality rate (CFR) (5). The goal of the Ending Cholera: A Global Roadmap to 2030 cholera control plan is to reduce cholera mortality by 90% (6). Globally the WHO reported around 2.9 million new cases of cholera in 69 endemic countries (7). Nine out of 22 countries in the Eastern Mediterranean Region (EMR) experienced cholera outbreaks and occasionally epidemics in the past ten years. In many parts of Iraq, cholera has been regarded an endemic disease since 1966, when the first epidemic of cholera occurred, with a case fatality rate of 8.8%. Iraq remained cholera endemic, with recorded outbreaks in 1998, 2007, 2008, 2012, and 2015 (8). According to the Iraqi Ministry of Health, new cholera epidemics occur in Iraq on June 20, 2022, mostly in the Kurdistan regions Sulaymaniyah province (9). Some challenges facing Iraq its location along the Tigris and Euphrates rivers, whose polluted waters provide the majority of the country's water supply, in addition to its contact with neighboring countries with periodic disease outbreaks, which make it more vulnerable to waterborne and infectious diseases (10). Open defecation, improper sewage disposal, and poorly maintained water and sewage systems have put the community in danger of catching water-borne illnesses like cholera (9). Despite Diyala governorate being free of cholera since the year 2015; it has faced an epidemic of cholera starting on 19/June till 12/11/2022, the total number of laboratories confirmed cases of cholera was 141 cases and two deaths only. This study aims to carry out an analysis of the available information on cholera outbreaks in Diyala province, 2022

Patients and Methods

Study protocol:

A descriptive study was conducted in the department of public health.

Study Period

The period of the study was from 1st January 2023 to 5th January 2023.

Setting of Study

This study was conducted in Diyala province, Diyala health directorate, public health department. It is about 57 kilometers northeast of Baghdad city the capital of Iraq and has an area of 17,685 square kilometers, and accounts for 4.1% of the total area of Iraq. According to the Central Statistical Organization (CSO), Ministry of Planning, Republic of Iraq, the total population of Diyala province in 2022 was 1,814,368.

Study population

All sectors that were included in the surveillance system in this study were 8. The data was collected from the surveillance unit, communicable control division of the public health department in Diyala, 2022.

Exclusion Criteria

Cases reported from districts outside the governorate were excluded from the study.

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Study Sample

Cases reported from eight health sectors in province.

Sampling Technique

All surveillance data of cholera from eight health sectors were included.

Official approval:

Official approval was granted from Diyala Directorate Health.

Statistical analysis:

Analysis of data was carried out using excel software (version 19). The data has been analyzed statistically for cholera reported cases that were recorded according to person, place, and time. Data were presented by frequency, percentage, attack rate, and case fatality ratio (CFR).

Results

The total number of confirmed cases of cholera was 139, death reported for two of these cases. According to the date of onset, the registration of cases began from July 19 to October 25, 2022 with a clear increase in the number of cases, especially in September, where the highest recorded ten cases in one day figure (1).

The total number of cholera cases was (n = 139), female (72) 52 % and male (67) 48%. However, the case fatality ratio (CFR) was 1.4%. While the attack rate in the governorate is 7.6 per 100,000 populations during 2022 shown in table (1) and the age mean of patients was (38.7 ± 17.14 years) and the occurrence of the disease is more incidence in the age group 30-44 and females more than males as shown in figure (2). Notifications and data surveillance indicate that the first and highest recorded cases were recorded in the Khanaqin district in (77 case) 55%, while the lowest cases were in Baldruze, Al-Khalis, and Al-Mansuria districts, with (1 case)1% figure (3).

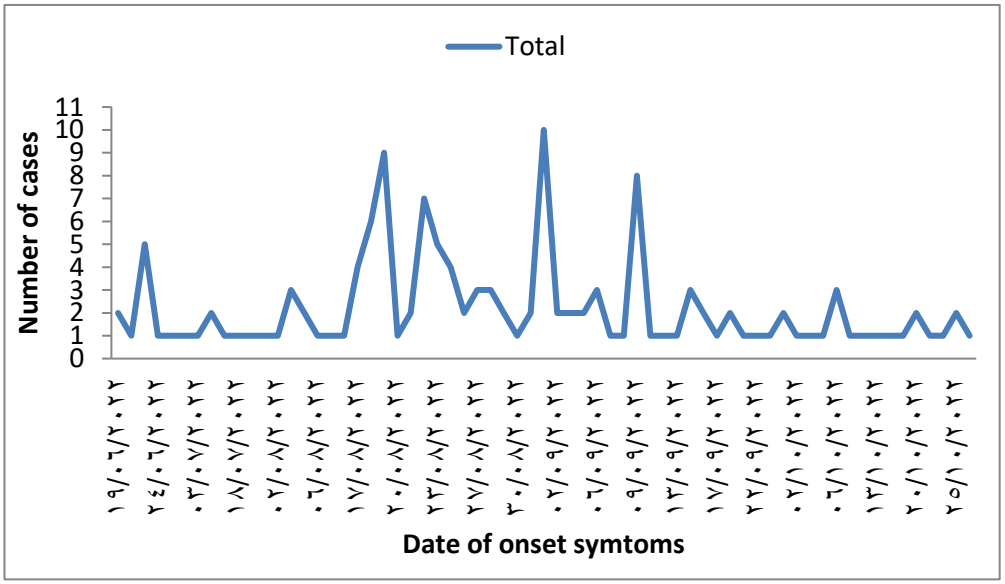

Figure (1): Number of cholera cases by date of onset in Diyala governorate, 2022.

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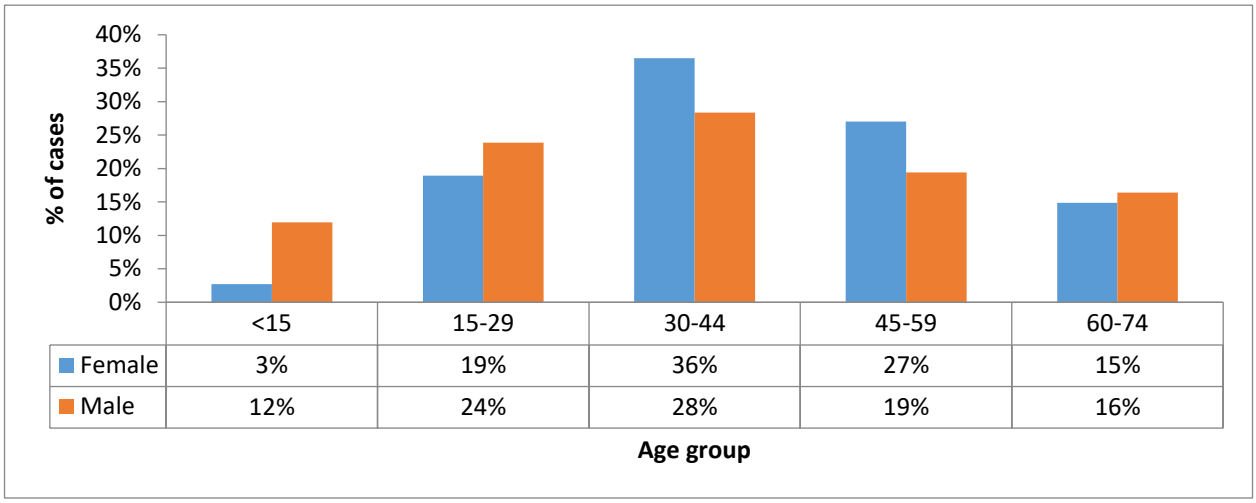

Figure (2): Cholera cases according to age group in Diyala governorate, 2022

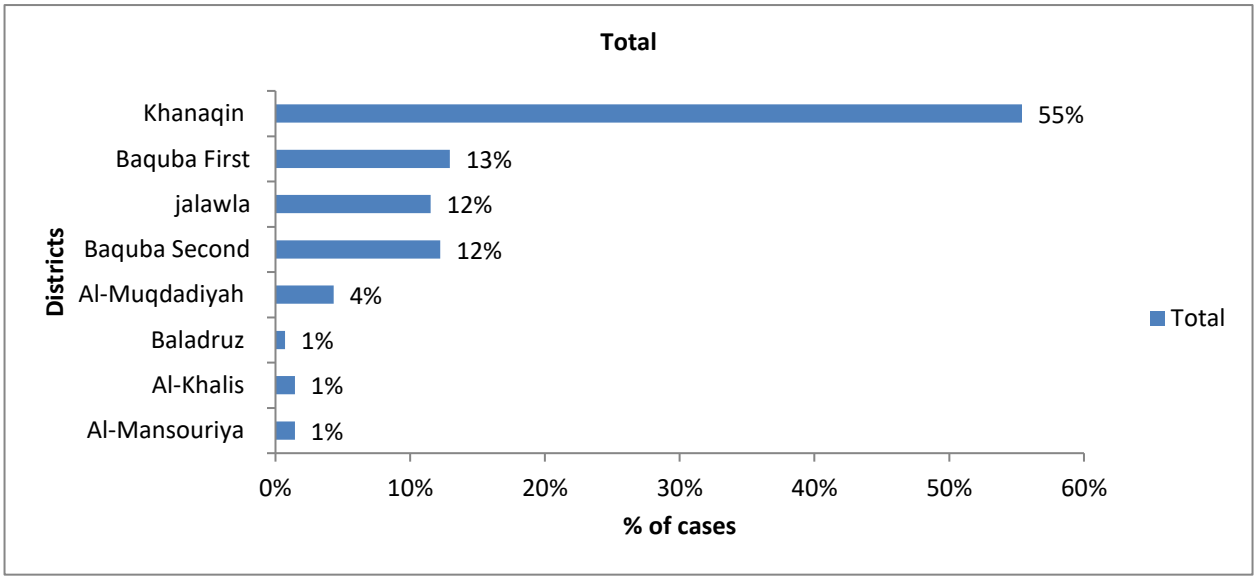

Figure (3): Distribution of cholera cases according to Districts in Diyala governorate during 2022

The attack rate of cholera cases in Diyala governorate, 2022

Table (1): Showed the attack rate of Cholera cases in the governorate was 7.6 per 100,000 populations, the highest attack rate in Khanaqin district was (77 cases) 46, while the lowest attack rate in Baldruze, Al-Mansuria, and Al-Khalis districts was (1 case) 0.3,0.6, and 0.8 respectively. It is known that infection rates are influenced by the population of the community at risk, meaning that the rates differ depending on the population in the sectors.

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Districts	Count cases	Total pop	Attack rate per 100,000
Baladruz	1	295328	0.3
Al-Mansouriya	1	161050	0.6
Al-khalis	1	127610	0.8
Al-Muqdadiyah	6	175011	3.4
Baquba 2	17	401953	4.2
Baquba 1	18	281582	6.3
Jalawla	16	83461	19.2
Khanaqin	77	168736	46
Total	139	1,814,368	7.6

Discussion

According to the World Health Organization, cholera is an acute diarrheal infection caused by the ingestion of the bacterium Vibrio cholera via contaminated food and water (11). Ninety-five percent of deaths and 2.86 million cases are caused by the disease, which is still endemic in nearly 69 countries (12). In this study, the total number of cholera cases was (n = 139), but the case fatality ratio (CFR) was 1.4%. This percentage is lower than a study done in Iraq during the 2022 outbreak that attacked many governorates (13) and also agree with the study done in Alborz Province, Iran (14). Globally this CFR is higher than a study done in India, 2011–2020 (15), and lower than study conducted in Syria linked deaths at a 0.08% case fatality rate (12). According to the date of onset, the registration of cases began from July 19 to October 25, 2022 with a clear increase in the number of cases, especially in September, where the highest recorded ten cases in one day this result agree with another study done in waist governorate, Iraq 2017(21). The age mean of patients in the current study was (38.7 ± 17.14 years), these results agree with the study done in Iraq (16, 13). The occurrence of the disease is more prevalent in the age group 30-44 and females more than males, this result agrees with a study done in Iraq in 2017 (17),study done in Iraq at national level showed a comparable distribution of ages (16) and disagrees with another study done in Iraq which found the male more than female (18) and study done in Iran a five-year study on the epidemiological approaches to cholera (19), this result disagrees with a study done in West Africa which found the sex ratio of females / males was equal (20). Regarding the distribution of cholera cases by districts in the governorate, the study showed that all the districts that were reported and most of the cases were from Khanaqin district. There are several issues related to this sector, sewage system, and insufficient supply of potable water in the governorate due to the acute shortage of river water, which affected the water supply and its provision to populations. On the other hand, people rely on groundwater from wells to fill the need for water for daily use, and this is considered not subject to examination periodicity by health oversight. It is possible that this interpretation could be similar to another interpretation from another study conducted in the Wasit governorate during 2017 interpreted

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the annual distribution of the disease may show little or no control over the risk factors that lead to cholera, like inactive sewage disposal and using disinfectant water in daily life activities like cooking or drinking (21) and a study done in Iraq at the national level found people rely on rivers, streams, and estuaries for domestic purposes, such as drinking water or supplying vehicle water or maybe a shortage in water provision and use of electrical pumps to draw unsafe water from the old pipes that may be contaminated with sewage disposal net due to the damage of both systems (16). The attack rate in the governorate is 7.6 per 100,000 populations during 2022 this rate is higher than a study conducted in the Wasit governorate, Iraq in 2017 and nationally in the same year (21) and higher than a study included Iraq during 2017 (16), this study at the governorate level has a high attack rate when compared with a study done in Syria at the national level with an attack rate of 0.1% (22) also higher than a study done in Yemen attack rates were below 1% (23). Travelers visiting cholera-endemic nations run the risk of contracting the disease, and individuals living in cholera-free nations may bring the infection with them from endemic or epidemic areas, imported cholera cases may be far higher than officially reported cases, as the World Health Organization (WHO) estimated that officially reported cases represent only 5%–10% of the true number of cases (24).

Recommendations

Awareness of the importance of the cholera disease, emphasizing the ways of transmission of the disease and how to prevent it and ensuring safe drinking water and uncontaminated food and dispose of waste and sanitation.

Source of funding

No source of funding

Ethical clearance

Official approval has been obtained to use data and data were analyzed without the names to protect privacy. This study was conducted according to the approval of College of Medicine/ University of Diyala and in accordance with the ethical guidelines of the Declaration of ethical committee of the College (Document no. 2023AHI808).

Conflict of interest

The author acknowledges no conflict of interest in this study

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تفشي الكوليرا في محافظة ديالى

اركان هاشم ابراهيم [١]، رفل عباس خضير [٢]، علي حازم مصطفى [٣]

الملخص

الخلفية الدراسية: لا تزال الكوليرا تشكل تهديدا للصحة العامة في جميع أنحاء العالم، وخاصة في البلدان التي تعاني من ضعف الوصول إلى المياه المأمونة ومرافق الصرف الصحي. وفقا للتقديرات، هناك ٢١٠٠٠-١٤٣٠٠٠ حالة وفاة و١,٣-٤ مليون حالة إصابة بالكوليرا سنويا.

الهدف من الدراسة: تهدف هذه الدراسة إلى إجراء تحليل للمعلومات المتاحة عن تفشي الكوليرا في محافظة ديالى، ٢٠٢٢.

النتائج: بلغ العدد الإجمالي لحالات الكوليرا المؤكدة (ن = ١٣٩)، والإناث (٧٢) ٥٢ ٪ والذكور (٦٧) ٤٨ ٪، تم الإبلاغ عن وفاة اثنين من هذه الحالات. وفقا لتاريخ البدء، بدأ تسجيل الحالات من ١٩ يوليو إلى ٢٥ أكتوبر ٢٠٢٢. ومع ذلك، بلغت نسبة الوفيات ١,٤ ٪، في حين بلغ معدل الاصابة في المحافظة ٧,٦ لكل ١٠٠,٠٠٠ نسمة خلال عام ٢٠٢٢، وكان أعلى معدل اصابة في قضاء خانقين (٧٧ حالة) ٤٦، في حين كان أدنى معدل اصابة في مناطق بالدروز والمنصورية والخالص (١ حالة) ٠,٣ و٠,٦ و٠,٨ على التوالي. كان متوسط عمر المرضى (٣٨,٧ ± ١٧,١٤ سنة) وحدوث المرض أكثر في الفئة العمرية ٣٠-٤٤ والإناث أكثر من الذكور

الاستنتاجات: حدوث تفشي الكوليرا خلال عام ٢٠٢٢ دون تسجيل حالات مؤكدة منذ عام ٢٠١٥ وحدوث حالات الكوليرا في المحافظة أكثر خلال شهري أغسطس وسبتمبر ومعظم الحالات كانت من قضاء خانقين.

الكلمات المفتاحية: تفشي المرض، الكوليرا، العراق، ديالى، معدل وفيات الحالات.

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