Hepatitis (A) Rates in Derna, Libya in 2019 and Suitable Nourishment

(Original Research Article)

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Received 03rd April 2023; Accepted 14th May 2023; published 29th Jun 2023

Abstract

The current study gives a brief explanation about the outbreak of hepatitis A epidemic in the city of Derna in Libya from June to December 2019. Approximately, 959 positive cases of hepatitis A were recorded. Of 959 cases, 675 cases (401 males and 274 females) were collected from multiple places in Derna including Al-Sahel Al Shargy, Bab Tobruk, Al-Jebella, Sheha, Embegh, Al-Fatayah, Theel Al-Wady, Al-Balad, Al-Mohasha, Al-Maghar, Wadi Al-Naga, Baten Bomansour, Al-Sayada Khadja, and Karsa. Data were also gathered from different locations in Eastern Libya including Al-Beda, Guba, Gaygab, Al-Dabosia, and Om Rosam. A face-to-face survey was performed on 208 individuals diagnosed with hepatitis A and their families at their residence places in Derna during the period from 26th June to 11th September 2019. Questions were focused on lifestyle factors including eating fast foods from restaurants, source of drinking water, source of fruits and vegetables they consumed, and types of foods they mostly ate. The approximate percentage of males and females were 59.1 % and 40.6%, respectively. This explains that males are almost 18.5% more likely than females to be susceptible to infect with hepatitis A. There was statistically significant difference between men and women for their infection with hepatitis A (P= 0.035). The great infection with hepatitis A was in Al-Sahel Al-Shargi with a percentage of 38.8% (64 Cases). The results showed that there was statistically significant difference between people infected with hepatitis A virus according to their place of residences (P= 0.018). The unifying factor between 208 interviewed patients was drinking water contaminated with sewage. About, 70% of patients ate meals from popular fast-food

restaurants. While 30% of patients ate vegetables and fruits coming from Egypt and irrigated with sewage water. A highly nutritious dietary program may be essential to prevent liver damage.

Key Words: Hepatitis A, Outbreak, Derna, Al-Sahel Al-Shargi, contaminated water with sewage.

Introduction

The hepatitis A virus considers one of the most frequent reasons of food borne infections. It represents as a viral infectious liver illness caused by hepatitis A virus (HAV) (Cuthbert 2001; Safiabadi et al 2017). The incubation period of hepatitis A is commonly from 14 to 50 days (generally 25 days). The sickness is typically mild, with symptoms take place in most of patients with hepatitis A. The hepatitis A virus is transmitted principally by the faecal-oral way. The infection happens when an uninfected person consumes food or water that has been polluted with the faeces of an infected person (WHO 2019). A human being experiencing infectious hepatitis A will suffer from "severe loss of appetite, fever and jaundice, itching, nausea, dark urine, vomiting, abdominal pain, taste changes, pale-colored stool, joint pain, diarrhea, and fatigue". All these signs confuse food intake and make it difficult to verify that the patient is well nourished at a time. Therefore, is essential to support the patient with a highly nutritious dietary program to prevent liver damage. The disease has a tendency to go away after about 2 months but may be remain for up to 6 months (American Liver Foundation 2005). A person diagnosed with hepatitis A is able to have and spread hepatitis A, even if that person does not have any symptoms. In detail, adults are no longer infectious 2 weeks after the sickness begins. Kids and citizens who have weak immune systems may be infectious for up to 6 months (American Liver Foundation 2005; WHO 2019).

There are numerous explanations about causes of hepatitis A infection. These causes include having sex with someone who has it, sometimes mother does not wash her hands properly after changing the diaper of her infected kid and a caregiver does not wash his or her hands appropriately after cleaning up the stool of patient with hepatitis A (Fiore 2004). Also, a person may touch his mouth after touching a contaminated object, as well as the traveling to the contaminated countries. Additionally, people drink water has been polluted by someone faeces and may consume fruits, vegetables, or

other foods prepared by a person who has the virus. Moreover, people eat raw shellfish harvested from water where the virus lives, or they swallow polluted ice. There is no accurate drug to treat hepatitis A and most patients are self-limited as most patients get rid of the illness on its own in the course of a few months (American Liver Foundation 2005; Kemmer and Miskovsky 2000; Ledner et al 1985). "WHO adopted the first Global Health Sector Strategy on Viral Hepatitis, 2016-2021"**.** The strategy has an idea of removing viral hepatitis as a community health emergency. Plus, the plan is to achieve the worldwide objectives of reducing new viral hepatitis infections by 90% and decreasing fatalities due to viral hepatitis by 65% in next 2030. The plan also contains formulating evidence-based policy, statistics for action, preventing transmission, elevating screening, care and treatment services (Who 2019).

The importance of this study emerged because of many reasons. Firstly, the response to find solutions to the health crisis happened in Derna city which was exposed to hepatitis A outbreak during the last six months in 2019. Secondly, the emergence of concern about this epidemic disease may continue and spread in neighboring cities. Thirdly, for fear that hepatitis A will constitute a major burden on health sector of Libya. Fourthly, the spread of unhealthy food habits in Libyan society and the weak nutritional culture of many people in Libya. Fifthly, Libyan society becomes accept the vital role of nutrition in maintaining human health and protecting it from epidemic hepatitis A. sixthly, people's health is precious and requires to find solutions to this crisis. This work is aimed to study the size of hepatitis A outbreak in Derna, Libya from June to December 2019; and to perform a face-to-face survey on individuals diagnosed with hepatitis A and their families at their residence places in Derna during the period from 26th June to 11th September 2019. Also, it is to explain the appropriate diet for treat hepatitis A disease.

Methodology

Data Collection and Analysis

Statistics were obtained from the National Center for Disease Control, Derna, the Office of Monitoring and Rapid Response, Primary Health Care Department, Derna, Libya. A total of 959 cases infected with hepatitis A were recorded from June to December 2019. About 675 cases (401 males and 274 females) were analyzed in this research study. Data collected from multiple places in Derna, Libya including Al-Sahel Al Shargy, Bab

Tobruk, Al-Jebella, Sheha, Embegh, Al-Fatayah, Theel Al-Wady, Al-Balad, Al-Mohasha, Al-Maghar, Wadi Al-Naga, Baten Bomansour, Al-Sayada Khadja, and Karsa. As well as data were obtained from different locations in Eastern Libya including Al-Beda, Guba, Gaygab, Al-Dabosia, and Om Rosam. Hepatitis A virus (HAV) blood test was performed in Al-Wahada Hospital, Health Centers, as well as Iben Roshed, Al-Razi, Ibn Sena, Al-Rasheed Laboratories, Derna, Libya. Graphs and percentage formulas of patients with hepatitis A were calculated using Microsoft office excel 2020 program.

A Face-To-Face Survey Study

A face-to-face survey study was carried out on 208 individuals diagnosed with hepatitis A (HAV) and their families at their residence places in Derna city during the period from 26th June to 11th September 2019. This survey assists the researcher to find solutions and decisions to solve the hepatitis A outbreak crisis in Derna city. Data was collected on a form (questionnaire) during the interview. Participants were asked to detail their nutritional habits before getting hurt hepatitis A. Also, the questions were focused on lifestyle factors including eating fast foods or meals from restaurants, source of drinking water and source of fruits and vegetables that they consume, as well as types of foods they mostly consumed.

Ethical Considerations

This study protocol was approved by the ethics committee of the Scientific Research Center in Derna University. Also, it was performed under the supervision of the National Center for Disease Control, Derna, Libya. All patients diagnosed with hepatitis A were informed about the research and gave their verbal consent to fill the questioner form.

Statistical Data Analysis

Descriptive statistics were performed using SPSS Statistics Software Program (version 20, Inc., Chicago, Illinois, USA). The Pearson Chi-square test was used to assess the

significance of the association between males and females being diagnosed with hepatitis A virus according to their sex and place of residence.

In all tests, $\alpha < 0.05$ was regarded statistically significant. All confidence intervals (CIs) were calculated at the 95% level of statistical significance.

Results and Discussion

Hepatitis an Outbreak in Derna from June to December 2019

The National Center for Disease Control, Derna, Libya stated that there were approximately 959 positive cases of hepatitis A virus during the last six months of 2019 in Derna city. Derna city is located on Mediterranean coast east of Benghazi city. It is laid on the eastern ridge of Jabel El Akhdar in the delta of the small Wadi Derna (Kezeiri 1982). Among 959 cases, approximately 675 cases (401 males and 274 females) were analyzed in this research study (Figure 1).

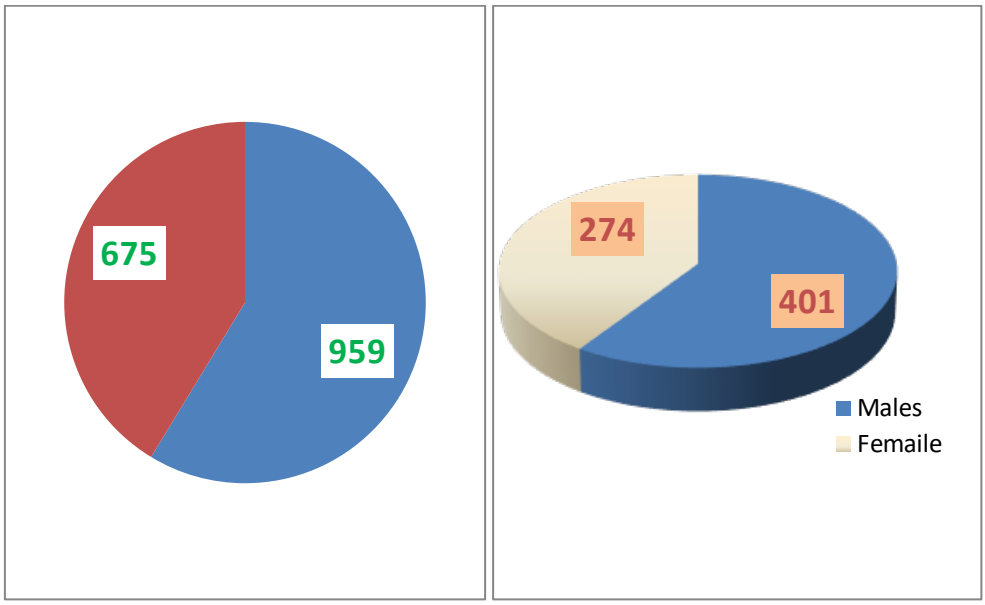

Figure 1: Total Number of Cases (n= 959) and Number of Males and Females Infected with Hepatitis A.

Referring to Figure 1, the approximate percentage of males and females were 59.1 % and 40.6%, respectively. This gives details that males are almost 18.5% more likely than females to be susceptible to infect with hepatitis A virus.

The descriptive statistic using Chi-square test (x^2) (test of significance in qualitative data) found that there was statistically significant difference between men and women for their infection with hepatitis A (P= 0.035). Although a previous study reported that females are more infected with viral infection than males (Scott and Litin, 2001).

Places of Hepatitis A Virus Outbreak in Derna

Of 675 cases infected with hepatitis A virus, about 165 cases live in different parts in Derna City (Figure 2). One of the important finding in this work showed that the great infection with hepatitis A virus was in Al-Sahel Al-Shargi with a percentage of 38.8% (64 Cases), followed by Al-Gebela , Al-fatayah, Sheha, Bab-Tobruk and Karsa with a percentage of 10.3% (17 cases), 10.3% (17 cases), 9.7% (16 cases), 8.5% (14 cases), 7.3% (12 cases), respectively. The significant increase in hepatitis A viral infection rates may suggest that there is a common factor causing the infection between different places in Derna city. As a comparison, the other places in Derna showed smaller infections with hepatitis virus including: Al-Balad, Al-Maghar, Sayadah Khadeja, Shareaa Al-Bahar, Impagh, Wadi Al-Naga, Theel Al-Wadi, Baten Bomansour and Al-Mohsha with a percentage of 3% (5 cases), 3% (5 cases), 2.4% (4 cases), 1.8% (3 cases), 1.8% (3 cases), 1.2 % (2 cases), 0.6% (1 cases), respectively. Another finding in this study demonstrated that some places in Derna City had equal infections with viral hepatitis A including Al-Gebela with Al-fatayah, Al-Balad with Al-Maghar, Shareaa Al-Bahar with Impagh, Theel Al-Wadi with Baten Bomansour and Al-Mohsha (Figure 2). The results showed that there was statistically significant difference between people infected with hepatitis A virus according to their place of residence (P= 0.018).

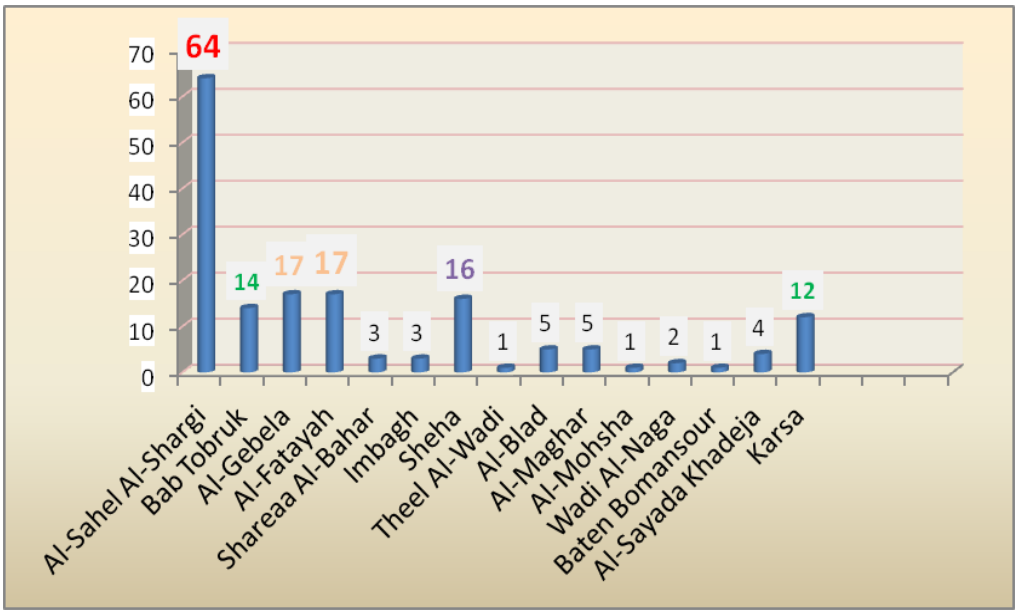

Figure 2. Distribution of Cases Infected with Hepatitis An According to Different Places in Derna, Libya (n= 165).

The present study gives an indication that hepatitis A virus infected a number of people in Derna city is coming from a specific source. This specific source should be a water or food borne. To compare with a hepatitis A viral outbreak that occurred twenty years ago in USA, this virus infected a large number of people and linked to fresh blackberries which considered as food borne outbreak (Cuthbert 2001).

Hepatitis an Incidence in Areas outside Derna

According to the registry office of the National Center for Disease Control, Derna, Libya, there were 24 cases infected with hepatitis A virus from different locations in Eastern Libya. Of 24 cases infected with hepatitis A virus, about 10 cases from Guba city and 7 cases from Ain Mara area, while 3 cases from Om Rasam city (Figure 3). Due to the proximity of these areas to Derna City, the viral infection may have been transmitted because of the same reasons that appeared in Derna city.

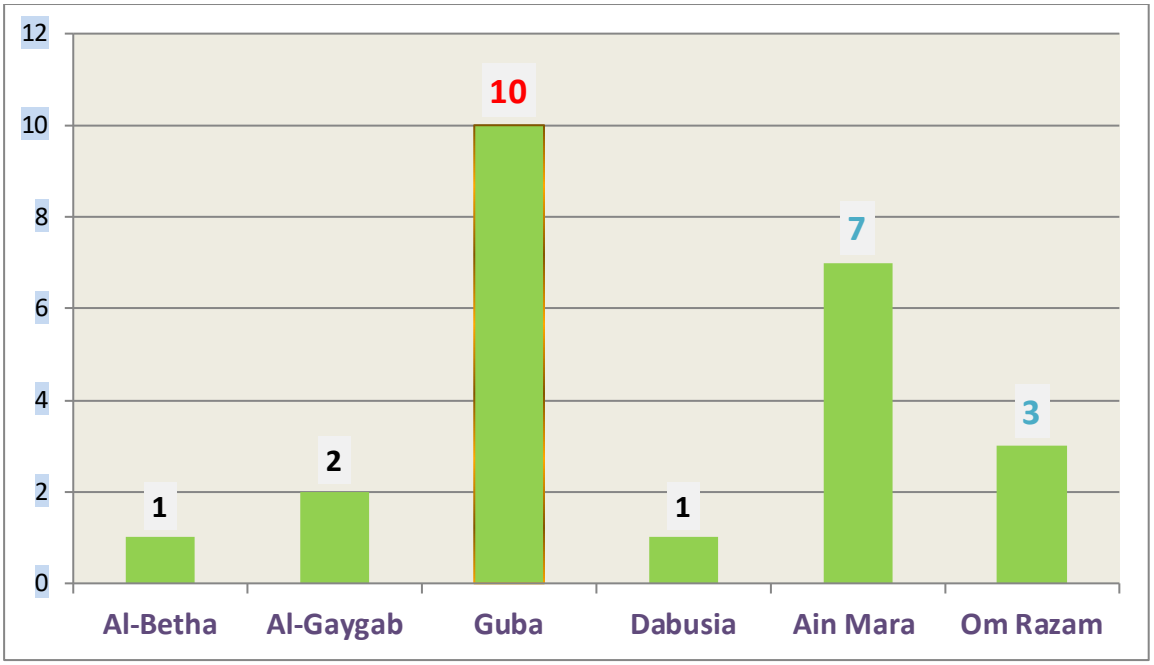

Figure 3. Distribution of Cases Infected with Hepatitis A According to Different Cities in Eastern Libya (n= 24).

In addition, the National Center for Disease Control and the Monitoring and Rapid Response Center, Primary Health Care Department, Derna documented that there is no death among the cases diagnosed with hepatitis A during the last six months in 2019 in Derna city. This indicates that hepatitis A outbreak in Derna city may not pose a great danger to society as a result of the recovery of those infected with this vital infection. This optimism does not prevent the fact that this virus can take a distant curve and may be fatal. It caused death when this epidemic disease spread in different places from the world especially in elderly (WHO, 2019).

Face-To-Face Survey Study

Face-to-face interview provides comprehensive explanations to allow participants to answer the questions correctly (Schroder 2016). In the present study, the survey was performed in Derna city during the period of 75 days. A total of 464 cases were positively diagnosed with hepatitis A virus during the period from 26th June to 11th September 2019. Among 464 patients, only 208 peoples diagnosed with hepatitis A agreed to interview and answer questions related to the spread of hepatitis A virus in Derna city.

The face-to-face survey was conducted in the homes of those infected with hepatitis A virus, with their families. Among 208 cases who were interviewed, 184 cases were positively IgM (new incidence), while 24 cases were positively IgG (old incidence). One of the important finding which became clear to us through this survey study, that there is the unifying factor between all 208 patients who were interviewed. The unifying factor was that the patients drank water contaminated with sewage. The present survey showed that 70% of patients ate meals from popular fast food restaurants. While 30% of patients ate vegetables and fruits coming from Egypt and irrigated with sewage water (Figure 4).

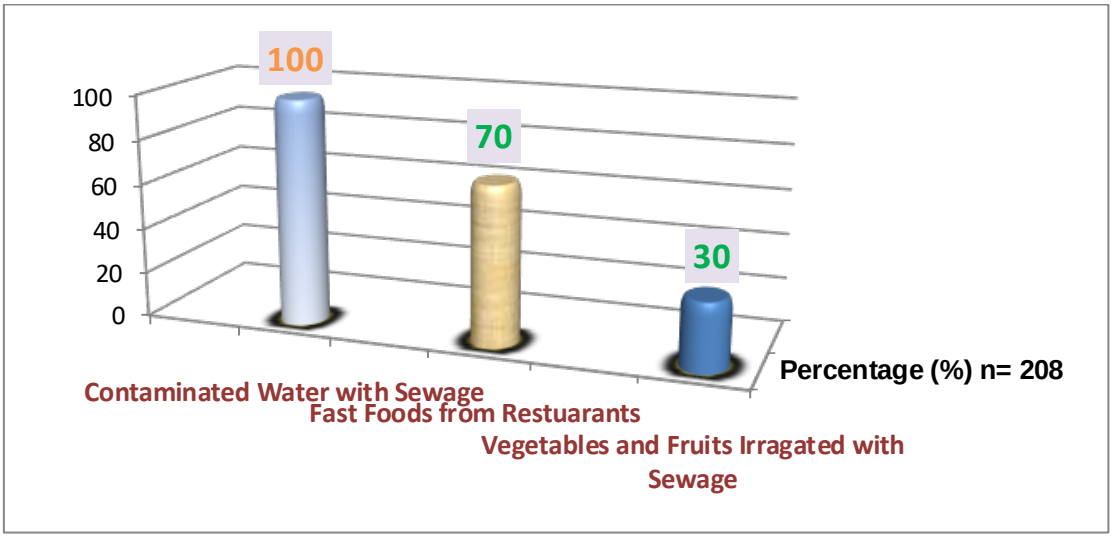

Figure 4. Some Reasons of Hepatitis A Outbreak in Derna from 26th June to 11th September, 2019

Hepatitis A and Suitable Nutrition

The dietary program for patients diagnosed with hepatitis A should contain the following: an abundance of fruits and vegetables, whole grains including oats, brown rice, and barley, lean protein including fish, skinless chicken, egg whites, and beans, low-fat or non-fat dairy products and healthy lipids including nuts, avocados, and olive oil. On other hand, some foods may cause liver damage including : high-calorie such as greasy, fatty, and sugary foods, saturated fats including butter, cream, fatty cuts of meat, and fried foods, and sugary treats including cookies, cake, soda, packaged baked goods, salty foods as well as alcohol and smoking (WHO 2019; American Liver Foundation 2005; Krause's 2000; Heerden 2001, Thompson 2010; Yasutake et al 2012).

Patients diagnosed with hepatitis A should follow the most important tips to protect them from this an epidemic disease. There are important tips include the following (WHO 2019; American Liver Foundation 2005; Krause's 2000; Heerden 2001):

- Take the prescription medicines and hospitalization is necessary in the presence of acute liver failure.
- Need to meet dietician to have a healthy diet plan.
- Get a lot of rest and stay home (no school or work).
- Clean their hands each time when they use the toilet or change a diaper.
- Consume small meals to replace fluids lost from vomiting and diarrhea.
- Eat fat-free or low-fat foods such as peeled fresh fruits and vegetables, fresh juices, fat-free milk and yoghurt, honey and, low-fat ice cream, vegetables soup, dry homemade crackers for patient suffers so ill and refuses to eat.
- Avoid alcohol, smoking, and all sexual activity as well as, stop preparing food for others.
- Stay away from mental stress, negative thinking, and depression and wake up and sleep early.
- Drink an electrolyte mixture for patients with repeated vomiting and diarrhea to keep patients liquid intake. In serious cases, the patient may have to be put on a drip to replenish body water and electrolytes.
- Keep house clean, cool with fresh air and wear loose clothes, and skip very hot baths and showers, as well as drink a lot of water for patients have itching.
- Proper disposal of sewage within communities.

Hepatitis A and Prevention

There are important tips include the following (WHO, 2019; American Liver Foundation 2005; Krause's 2000; Heerden 2001; Thompson 2010, Fiore 2004):

Country Prevention

- Providing physically powerful maintenance of wastewater to prevent its penetration into ground water.
- Preparing a concrete plan to determine the source of hepatitis A infection.
- Preparing a solid plan for garbage disposal and prevent burning garbage near housing areas and food handling regions.

- Improving the organizations that check sanitation, food safety and immunization.
- Providing sufficient supplies of safe drinking water.
- Providing Hepatitis A vaccine in the communities.
- Providing the financial support to the dieticians so the patient should have referred to a dietician for evaluating special diet.

Prevention as Personal Hygiene Practices

- Individuals should clean his/her hands with soap and warm water before and after cooking, after using the bathroom, and after changing diapers.
- Individuals should wash fruits and vegetables thoroughly before eating and keep away from consuming raw or undercooked meat and fish.
- Patients Avoid preparing food for others while they are actively infected.
- Cleaning the patient's waste with disinfectants (Fiore 2004).

Libyan National Disease Control and Prevention

- Communicating with public health officials with detailed cases to providing rapid technical assistance.
- Collecting data reported on assured cases and evaluating and monitoring these data from a national perspective.
- Testing clinical specimens from suspected hepatitis A persons when requested by medical centers.
- Replying questions related to molecular and serologic laboratory testing.
- Providing data to public and healthcare providers through a variety of media (NCDC, 2021).

Conclusion

People's health is precious, which requires the need to find solutions to hepatitis A outbreak crisis. The emergence of concern about this epidemic disease may be related to its ability to continue and spread in neighboring cities. The real fear that hepatitis A will constitute a major burden on health sector of Libya.

About, 959 positive cases of hepatitis A were reported during the last six months in 2019, in Derna city. Males are almost 18.5% more likely than females to be susceptible to infection with hepatitis A virus. One of the important finding in this work showed that the great infection with hepatitis A virus was in Al-Sahel Al-Shargi with a percentage of 38.8% (64 Cases). The unifying factor between all interviewed patients was drinking water contaminated with sewage.

Libyan society should accept the vital role of suitable nutrition in maintaining human health and protecting from epidemic hepatitis A.

Acknowledgments

We acknowledge the National Center for Disease Control, Derna, and the office of Monitoring and Rapid Response, Primary Health Care Department, Derna, Libya as well as all the participants in this work for providing the research facilities. Strong thanks to Mr Ahmad Al Haj for providing practical information about the spread of the hepatitis A virus in Derna City.

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