

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

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Vol. 9, Issue 1, January 2020

## Estimation of Food Outline in Patients Infected by Hepatitis B and C

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**ABSTRACT:** This study is proposed to spot type of diet eaten by patients during their infection by hepatitis B and C and to highlight the role of appropriate healthy foods in the patients suffering from HBV and HCV infections. It is also to offer diet recommendations that can reduce the complications of these viral infections. Case control study was carried out on 200 individuals aged 45-75 years at Al-shefa and Al-Shema Medical Clinics, Tobruk, Libya during the period from November 2016 to March 2018. Out 200 interviewed individuals, 100 cases (60 males and 40 females) were infected with HBV and HCV. Control consists of (50 males and 50 females) were healthy and did not suffer from any disease. Among the 100 interviewed patients with hepatitis, 50 patients have not practiced physical exercise during the disease course. About 54 % were eating a lot of red meat, fast foods and fried potatoes, while 18 % of cases rarely ate fruits and vegetables and only 10% of cases drink a lot of water. Whereas, among healthy control participants, they were mostly do exercise. 70% of cases were eating a lot of vegetables and fruits, drinking a lot of water and consumed rarely fast foods. Furthermore, 30% of health control participants were consumed a lot of red meat, but they ate plenty of vegetables and fruits and drinking many of water. Patients diagnosed with hepatitis should over control their diet by eating the right types of food and follow special diet in order to reduce the complications of these infections and to maintain a healthy liver.

**KEYWORDS:** Hepatitis B and C, healthy foods, recommendations, case control study, diet.

### I. INTRODUCTION

There are many previous studies performed in Libya to determine the prevalence of hepatitis B virus (HBV) and hepatitis C virus (HCV) in the healthcare workers (HCWs) [5,16 ,31, 32]. Hepatitis B and C viral infections represent the foremost important blood-transmitted viral infections. These viral infections can lead to liver damage that may direct to death [16]. The transmission may occur because of failing to apply protective barriers [14, 17, 23]. A patient infected with viral hepatitis mostly will have severe loss of appetite, anorexia, nausea, vomiting, abdominal pain, taste changes, fever and jaundice. All these symptoms lead to problems in food intake. Therefore, it is necessary for hepatitis patient to have a healthy nutritious diet to stop liver damage [12, 27]. Liver is an organ that important to alter food constituents to energy. Many studies reported that healthy nutrition with well-balanced diet might protect liver damage from hepatitis. However, there is no exactly particular diet for hepatitis recovery [2, 29]. It is extremely important for patients infected with hepatitis B or C to observe their diet by eating the right types of food. The diet should include foods that are simple for the liver. Also, patients diagnosed with hepatitis stay away and keep out foods that may cause the liver to work harder as this can delay a patient's recovery from the disease [27]. Patients infected with hepatitis require tracking a healthy lifestyle to reduce liver damage. A healthy diet should contain a plenty of fruits and vegetables, whole grains, lean protein, low-fat or non-fat dairy products, honey and healthy lipids such as nuts. Conversely, an unhealthy diet including fast foods, preserved foods and fried foods might cause liver damage [2, 29].

In Libya, infected people with hepatitis B (HBV) and C (HCV) become a serious health concern for safety of health institution workers [5,16]. This issue has become principally significant in the recent years, as a result of weak control of Libyan borders, lack in health screening services and weak preventive policies due to inadequate financial resources [7, 8, 17, 19]. Also, the preventive policies and economic resources may become not enough since the Libyan revolution in 2011. Moreover, many illegal immigrants particularly from high epidemic countries entered illegally to Libya on their way to Europe [18, 24, 20, 21]. Many of these travellers may be a possible source of infection during

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their staying in Libya and increase the opportunity of transmission of these pathogens in healthcare centres [6, 9, 14, 15, 22, 23, 24, 25, 26]. In addition, health authorities have applied substantial defensive measures in recent decades to stop hepatitis viral incidence both in healthcare settings and in the community including implement worldwide standard safety measures in health service centres and willing all patients to undertake pre-operative screening for HBV, HCV in addition to HIV as a routine investigation. This pre-operative screening helps to protect both healthcare workers (HCWs) and patients from transmission of these viral infections [1, 3, 4, 10, 13, 30].

We assume little is known about the Tobruk population knowledge on dietary habits among hepatitis patients. This study is performed to know the food pattern of hepatitis patient's awareness about the quality of their daily diet during their suffering from hepatitis infections. Also, it is proposed to identify the recommended diet that can decrease the complications of these viral infections.

## II. MATERIALS AND METHODS

### 1. Nutritional Case Control Study

A case control study was performed on 200 participants aged 45-75 years at Al-Shefa Clinic and Al-SHEMA Clinic in Tobruk during the period from November 2016 to March 2018. 100 participants (60 males and 40 females) were patients infected with hepatitis HBV or HCV. While, other 100 participants (50 males and 50 females) were healthy control. The intention of this work is to know the food pattern of the hepatitis patient's attentiveness about the excellence of their daily diet.

Data was collected by questionnaire during the interview. 100 patients were asked to detail their nutritional habits throughout viral hepatitis infection. Whereas, other 100 healthy control were asked to detail their nutritional habits throughout one year. There also questions were only focused on past family history, life style factors including; eating red meat, fast foods, drinking gaseous beverages, drinking water and eating fruits and vegetables; and exercise, and smoking status.

### 2. Statistical Data Analysis

Descriptive statistics were performed using SPSS Statistics Software (version20, Inc., Chicago, Illinois, USA). Pearson Chi-square test was used to highlight if there was any statistical significance differences between variables. In all tests,  $\alpha < 0.05$  was regarded statistically significant. Data were tabulated; different ratios were calculated using Microsoft Office Excel 2016.

### 3. ETHICAL CONSIDERATIONS

This study protocol was approved by the ethics committee of the Scientific Research in Tobruk University, and was performed under the supervision of the Faculty of Medical Technology, Tobruk, Libya. All patients were informed about the research and gave their verbal consent.

## III. RESULTS

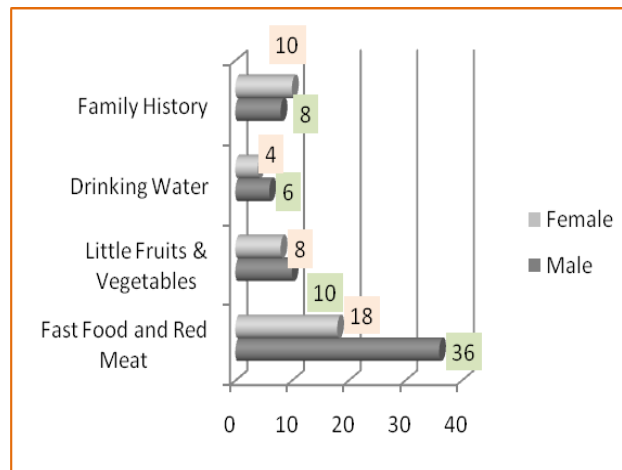
The results show that among the 100 interviewed hepatitis patients, 50 patients (30 males and 20 females) had not practiced physical exercise during the disease course, and had primary to secondary education. About 54 % of them (36 males and 18 females) were eating a lot of red meat, fast foods and fried potatoes, while 18 % of cases (10 males and 8 females) rarely ate fruits and vegetables. Only 10% of cases (6 males and 4 females) drank a lot of water (Figure1). Moreover, 82 cases ate lots of fruits and vegetables.

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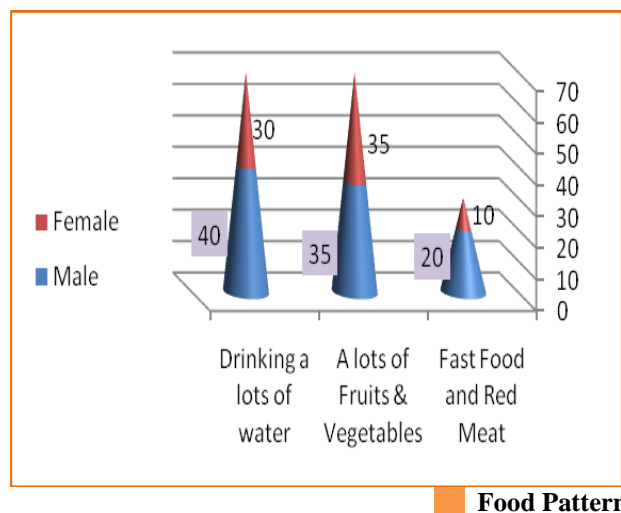
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**Figure: (1).** Nutritional habits of Patients Infected with Hepatitis B and C.

Approximately, 100 healthy participants as control were interviewed to know their nutritional habits before one year from interview to identify their daily diet habits (Figure 2).



**Figure: (2).** Nutritional Habits of Control Participants.

Along with healthy 100 participants, they were mostly doing exercise and rarely consumed fast foods and fried foods. About, 70% of cases (35 males and 35 females) ate a lot of vegetables and fruits. Also, 70 % of cases (40 males and 30 females) drank a lot of water and rarely consumed fast foods. Whereas, 30% of cases (20 males and 10 females) consumed a lot of red meat, but they ate plenty of vegetables and fruits and drank many of water and did exercise activity. Table 1 explains the percentage of food patterns of cases suffering from hepatitis and healthy control cases.

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**Table: (1).** Percentage of Food Patterns of Hepatitis Cases and Healthy Control Cases.

Food Patterns	HP	HCP
Drinking Water	10	70
Eating Fruit and Vegetable	18	70
Fast Foods and Red Meat	54	30

\*HP: Hepatitis Patients; HCP: Healthy Control Participants.

## IV. DISCUSSION

A control study was conducted to assess the knowledge of patients about the food they consume. About half of patients infected with HBV and HCV were not care about exercise sports and had low education. Previous studies implied that there is association between low education and hepatitis awareness [11, 28]. In addition, most of men diagnosed with either hepatitis B or C were smokers. Referring to Figure 1, approximately, some of interviewed patients had family history. This is similar to an earlier study reported that several of the interviewed hepatitis patients had family history [28]. Also, more than half of patients consumed mostly red meat and fast foods. The continuous consumption of red meats (particularly fast foods) including beef and lamb, processed meats and saturated fats may enhance health problems in liver. A previous study documented that at high cooking temperature, red meat may produce different classes of carcinogenic compounds that may cause fatty liver or may damage liver [30]. Moreover, 90% of patients drank less amount of water daily. This implied that most patients do not care about drink a valuable amount of water and they may lack the understanding about the importance of drinking a lot of water daily for biochemical reactions in their bodies. This points to that the majority of the patients did not have knowledge about the healthy diet. Also, Kumar et al. [28] implied that most interviewed hepatitis patients did not have adequate information about good diet.

From Figure 2, along with 100 healthy interviewed as controls, they were mostly doing exercise and rarely consumed fast foods and fried foods. Also, they mostly were eating a lot of vegetables and fruits, and drinking lots of water and rarely consumed fast foods. Whereas, many of them were consumed a lot of red meat, but they ate plenty of vegetables and fruits and drinking many of water and did exercise activity. This indicates that control participants follow the basic tips for healthy nutrition. Referring to Table 1, the descriptive statistic using Chi-square test ( $\chi^2$ ) (test of significance in qualitative data) found that there was statistically significant difference between patients infected with hepatitis and healthy participants for their nutritional habits ( $P= 0.017$ ). This indicates that food outline was different in patients and control cases.

Patients suffering from hepatitis should positively regulate their diet by eating the right types of foods and follow special diet rule to reduce the complications of these infections and to have a healthy liver. This is because unhealthy diet can lead to liver troubles including a fatty liver, when it contains high calories. For example, patients suffering from hepatitis C are mainly having a fatty liver may develop liver cirrhosis and diabetes. In comparison, a healthy diet with exercise will help reducing body fat and control blood sugar. This will definitely help protecting liver from hepatitis C and B viral infection [13]. Diets rich in high fibres including whole grains, honey, raw vegetables and fruits can help in maintaining healthy liver; because this type of food is low fat, rich in antioxidants and anti-inflammation constitutes that help in supporting patient immune system [30].

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## V. HEALTHY DIET AND RECOMMENDATIONS

A healthy diet should contain a plenty 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, an unhealthy diet might cause liver damage including much high-calorie such as greasy, fatty, and sugary foods that may lead to obesity and fatty liver. A fatty liver might develop cirrhosis of the liver and interfere with the effectiveness of drugs that target the hepatitis virus. Patients diagnosed with hepatitis should avoid eating saturated fats including butter, sour cream, fatty cuts of meat, and fried foods, and sugary treats including cookies, cake, soda, packaged baked goods, salty foods and alcohol [29]. Some important tips help body stays healthy [27, 29].

- Patient should have referred to a dietician for evaluating special diet and medical record.
- Drink a large amount of water and avoid alcohol because it is toxin to the liver.
- Maintain body weight in a healthy range for height using body mass index measurement (BMI).
- Maintain healthy calorie intake.
- Eat whole-grain cereals, breads, grains, adequate protein, and lots of fruits and vegetables because they are important sources of many nutrients, such as potassium, fibres, vitamin C, beta-carotenes, and folic acid.
- Eat adequate protein to heal and rebuild damaged liver cells such as dairy products that are low-fat or fat-free, meats, fish, dried beans, soy, nuts, and eggs. These foods provide protein, as well as B vitamins, vitamin E, iron, zinc, and magnesium.
- Do exercise to keep weight down and reduce some of the side effects of hepatitis medications.
- Avoid fast-food restaurants, preserved foods and gaseous beverages.

## VI. CONCLUSION

Our study found that patients diagnosed with hepatitis mostly did not have the enough knowledge about the healthy diet. They mostly did not care about exercise, ate a lot of red fatty meats, drank little of water, but they tended to ate a lots of vegetables and fruits. However, healthy participants as control mostly did exercise, drank a lot of water, ate a lot of fruits and vegetables, although many of them tended to consume a lot of red meats. Therefore the present study recommends that the exercise with diet rich in high fibres including whole grains, honey and raw vegetables and fruits may protect liver from complications caused by hepatitis B and C pathogens infections, for the reason that this diet is low in lipids and rich in antioxidants and anti-inflammation constitutes; in addition, it supports the immune system.

## ACKNOWLEDGEMENT

Special thanks to all the staff who works in Al-Shema and Al-Shefa Clinics for their assistant for collecting data.

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