

## The spread of liver fibrosis and cirrhosis in the city of Tikrit

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### Abstract:

The current study was conducted in Salah al-Din Governorate - Tikrit city from November 2021 to April 2022, and injuries were collected for the period from 2018 to 2021. A total of 398 injuries were recorded among males and females of various ages. The study was divided into (4) groups as follows: The first group included (males with liver cirrhosis during the years 2018-2019, referred to as Group (G1)). The second group included (males suffering from liver cirrhosis during the years 2020-2021, referred to as group (G2)). The third group included (females with liver cirrhosis or fibrosis during the years 2018-2019, and several subgroups (G3)). The fourth group included (females with cirrhosis or liver fibrosis during the years 2020-2021 and several subgroups). (G4). The results showed that age and gender (males and females) have different effects on the changes occurring in physiological parameters. The study showed that ascites (fluid retention in the abdominal cavity) is one of the most common complications of liver cirrhosis, which is associated with unhealthy habits and increased risk of disease and worsening symptoms in the long term. There are other potential complications that may threaten the patient's life, such as hepatic encephalopathy (confusion and coma) and bleeding from esophageal varices. In general, cirrhosis is an incurable disease, and treatment usually focuses on preventing the progression of the disease and increasing its complications. And the only available option in the advanced stages of liver cirrhosis is a liver transplant.

**Keywords:** fibrosis, liver fibrosis, liver, cirrhosis.

## إنتشار تليف وتشمع الكبد في مدينة تكريت

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### مستخلص:

أجريت الدراسة الحالية في محافظة صلاح الدين - مدينة تكريت للفترة من تشرين الثاني/ 2021 م ولغاية نيسان/ 2022 م ، وتم جمع الإصابات للفترة من عام 2018 م ولغاية عام 2021 م ، وقد تم تسجيل (398) إصابة من الذكور والاناث بمختلف الاعمار من الذكور والاناث .

قسمت الدراسة الى (4) مجاميع وكما يلي :

المجموعة الاولى ضمت (ذكور مصابين بمرض تشمع الكبد خلال الاعوام 2018-2019 م وعدة مجموعة (G1)).

المجموعة الثانية ضمت (ذكور مصابين بمرض تشمع الكبد خلال الاعوام 2020-2021 م وعدة مجموعة (G2)).

المجموعة الثالثة ضمت (اناث مصابات بمرض تشمع او تليف الكبد خلال الاعوام 2018-2019 م وعدة مجموعة (G3)).

المجموعة الرابعة ضمت (اناث مصابات بمرض تشمع او تليف الكبد خلال الاعوام 2020-2021 م وعدة مجموعة (G4)).

وقد اظهرت النتائج ان للعمر ، والجنس (الذكور والاناث) تأثيرات مختلفة في التغيرات الحاصلة في المعايير الفسيولوجية.

واظهرت الدراسة ان الاستسقاء (احتباس السوائل في التجويف البطني) من أكثر المضاعفات شيوعاً لمرض تشمع

الكبد والذي يرتبط بالعادات غير الصحية وزيادة احتمالات الإصابة بالمرض وتفاقم الأعراض على المدى الطويل ، وهناك

مضاعفات أخرى محتملة قد تهدد حياة المريض ، مثل الاعتلال الدماغي الكبدي (تشوش وغيبوبة) ونزيف في دوالي المريء.

وعموماً تشمع الكبد مرض لا يمكن الشفاء منه ، وعادةً ما يركز العلاج على منع تفاقم المرض وزيادة مضاعفاته. ويكون

الخيار الوحيد المتاح في المراحل المتقدمة من تشمع الكبد هو عملية زرع الكبد .

الكلمات الدالة : التليف ، تليف الكبد ، الكبد ، تشمع الكبد.

## 1. Introduction

The liver is the largest glandular organ in the body, weighing about one and a half kilograms, reddish-brown in color, and divided into four lobes of unequal size. The liver is located on the right side of the abdominal cavity under the diaphragm, and blood is transported to it through the hepatic artery, which carries blood and oxygen from the aorta. The portal vein transports blood to it, carrying digested food from the small intestine. The liver is considered one of the most important organs in the body because it plays a fundamental role in metabolism and has many functions in the body, such as detoxification. It also serves as a storage center for glycogen and a protein synthesis center. (1).

The liver is considered a chemical factory that operates continuously for twenty-four hours throughout a person's life, undertaking the tasks of (production, storage, recycling, distribution) to prepare vast amounts of essential nutrients for the human body. The liver performs no less than five thousand vital functions for sustaining life, as it produces the basic building blocks neces-

sary for body construction and detoxifies harmful chemicals resulting from combustion. It also produces bile and transports it to the intestines through the bile ducts distributed within. (2). The characteristic pathological feature of cirrhosis is the formation of scar tissue that replaces healthy parenchymal tissue, which obstructs blood flow through the portal vein and affects the liver's normal function. Recent research has shown the pivotal role played by the stellate cell, a type of cell that usually stores vitamin A, in the development of cirrhosis. It is noteworthy that damage to the hepatic parenchymal tissues activates the stellate cell, which becomes contractile (called myofibroblasts) and impedes blood flow in its normal circulatory pathway. (3). Additionally, this cell secretes a substance known as Transforming Growth Factor Beta 1 (TGF- $\beta$ 1), which leads to a fibrotic response and proliferation in connective tissue. Moreover, it disrupts the balance between the proteolytic enzyme complex and the naturally occurring tissue inhibitors (TIMP 1 and TIMP 2), leading to the degradation of the extracellular matrix and its replacement with a substance secreted

by the connective tissue. Fibrous tissue bundles (barriers) separate the liver cell nodules, which eventually replace the complete histological structure of the liver, resulting in reduced blood flow to all body organs. The spleen becomes congested, and there is an increase in platelet fragmentation, meaning a decrease in their number due to spleen enlargement. It is worth noting that portal hypertension is the cause of the most severe complications of liver cirrhosis. (4).

The objective of the study Due to the widespread prevalence of liver cirrhosis and fibrosis in the city of Tikrit, the current study aimed to:

1- To determine the number of male and female patients with this disease from 2018 to 2021.

2- Identifying the causes of liver cirrhosis and studying the methods of treating this disease. .

3- Is the disease hereditary or non-hereditary?

4- Knowing whether the disease is contagious or non-contagious.

5- Knowing the appropriate treatment for the disease.

6- Identifying the prevalence of the disease in the studied geographical

area.

## 2. Materials and Methods:

### First - Liver Cirrhosis Diagnosis:

The diagnosis of liver cirrhosis heavily relies on the medical history and physical examination, and there is a need to conduct tests to diagnose liver cirrhosis or its causes. Through the physical examination, the doctor looks for signs of liver cirrhosis such as liver enlargement, spleen enlargement, ascites, edema, palmar erythema, jaundice, and many other factors. Often, the presence of liver cirrhosis can be assumed based on a medical history and physical examination whose results match those seen in liver cirrhosis. However, the definitive diagnosis of cirrhosis is only made by extracting a sample and examining it under a microscope in the laboratory. Since liver cirrhosis is an expression of the presence of fibrotic changes in the liver, these changes can only be confirmed by examining the liver tissue under a microscope.

### Secondly - The Exams:

Many tests are used to diagnose liver cirrhosis, monitor liver cirrhosis, and diagnose complications, and there are other tests used to diagnose the causes

of liver cirrhosis.

1- Liver Biopsy: A liver biopsy involves extracting a sample from the liver, and it is the best and most accurate test for diagnosing liver cirrhosis. It also helps evaluate the degree and severity of cirrhosis and its response to treatment. Sometimes, the cause of liver cirrhosis can also be diagnosed. The sample is extracted from the liver using a needle that is inserted through the skin into the liver during an imaging test such as an ultrasound, where the location of the needle in the liver can be observed.

2- Imaging Studies: The importance of imaging studies lies in their assistance in diagnosing liver cirrhosis, the progression of liver cirrhosis, or its complications. The liver, when cirrhotic, appears small in size and filled with scars, nodules, and is irregular. They also help in diagnosing certain causes such as primary sclerosing cholangitis and right-sided heart failure. Among the most important tests used are:

2-1 Ultrasound, which is usually used to assist in extracting a liver sample, as well as for diagnosing ascites and liver cancer.

2-2 Computed Tomography (CT) is

primarily used to diagnose complications such as liver cancer and assess its severity. It is also used to perform liver biopsies in some cases and helps diagnose certain causes of cirrhosis, such as fatty liver disease and primary sclerosing cholangitis.

Magnetic Resonance Imaging (MRI).

2-3 Upper Gastrointestinal Endoscopy: A long tube with a camera at the end is inserted into the esophagus and stomach for examination, and it is used for both diagnosing and treating varices. Thirdly - Blood Tests: Blood Tests They are a set of tests used to help diagnose liver cirrhosis and some complications:

1- Complete Blood Count (CBC): It helps in diagnosing complications such as anemia, thrombocytopenia, and leukopenia. Liver enzymes: These include several enzymes – alanine aminotransferase (ALT) and aspartate aminotransferase (AST), which are elevated in cases of liver cirrhosis or liver diseases. In the case of alcoholic hepatitis or alcoholic cirrhosis, aspartate aminotransferase (AST) levels rise more than alanine aminotransferase (ALT) levels. (5) .

2- Alkaline Phosphatase enzyme:

ALP – Alkaline Phosphates, which is often elevated in the blood.

3- Bilirubin: Bilirubin, which increases in concentration in the blood as liver cirrhosis progresses.

4- Albumin: Albumin is the protein produced in the liver, and in the case of liver cirrhosis and failure, the liver does not produce it, leading to a decrease in albumin concentration. A low albumin concentration indicates disease progression.

5- Prothrombin Time (PT) is a test conducted to examine blood coagulation factors and their function. In the case of liver cirrhosis, blood coagulation factors are reduced, leading to An increase in prothrombin time indicates the progression of liver cirrhosis, and the blood coagulation factors produced and secreted by the liver can be tested, with their concentration being low in cases of liver cirrhosis.

There are many other tests conducted to diagnose the causes of liver cirrhosis, such as blood alcohol level tests, tests to diagnose viral hepatitis, copper level tests to diagnose Wilson's disease, blood antibody tests to diagnose autoimmune hepatitis, and cholesterol and glucose concentration tests

to diagnose fatty liver disease. (6).

#### **Fourth - Cirrhosis Grades: Cirrhosis Grades**

Cirrhosis has several grades, and it is often classified according to data from the medical history or tests. One of the most important scales used to diagnose liver cirrhosis is the Child-Pugh Score. The scale uses several parameters to determine the degree of liver cirrhosis. Each parameter is given a score from one to three, and then the points are summed up. The data are: bilirubin concentration in the blood, albumin concentration in the blood, prothrombin time, ascites, hepatic encephalopathy. (7).

According to the total points accumulated by each of the data, liver cirrhosis patients are classified into three grades:

1- Grade A with a total of 5-6 points: These patients are the least severe cases and can be treated with medications and avoid complications.

2- Grade B with a total of 7-9 points: These are patients whose condition is moderate and can be treated with medications to avoid complications, but they may need a liver transplant.



3- Grade C with a score of 18 points or more: They need a liver transplant as soon as possible due to complications and the worsening of their condition.

The likelihood of death increases as the degree of liver cirrhosis progresses, and there are other scales that use dif-

ferent data, such as the MELD scale. MELD) and the scales are used to determine the priority for liver transplantation among patients, as the patient with advanced stage is prioritized for liver transplantation over others.



Figure (1) The actual appearance of liver cirrhosis.  
(Vander et al .,1998).

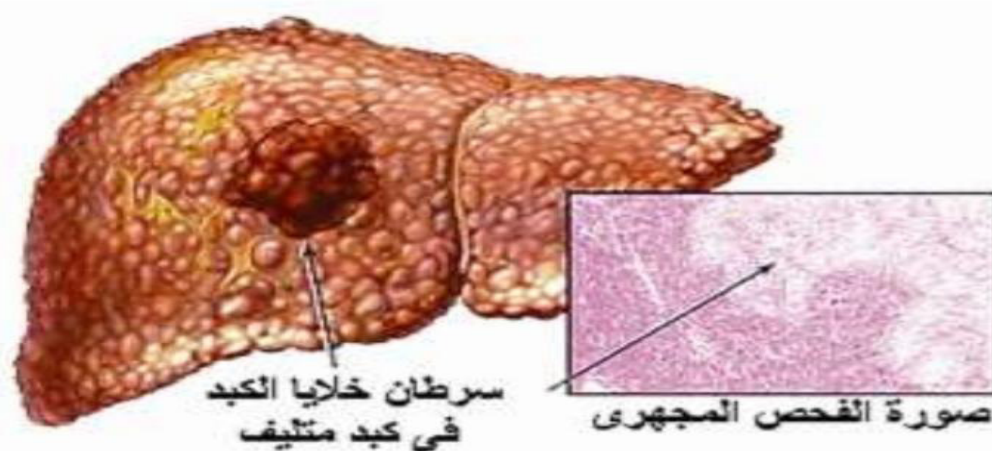


Figure (2) Microscopic examination of liver cancer in cirrhotic liver.

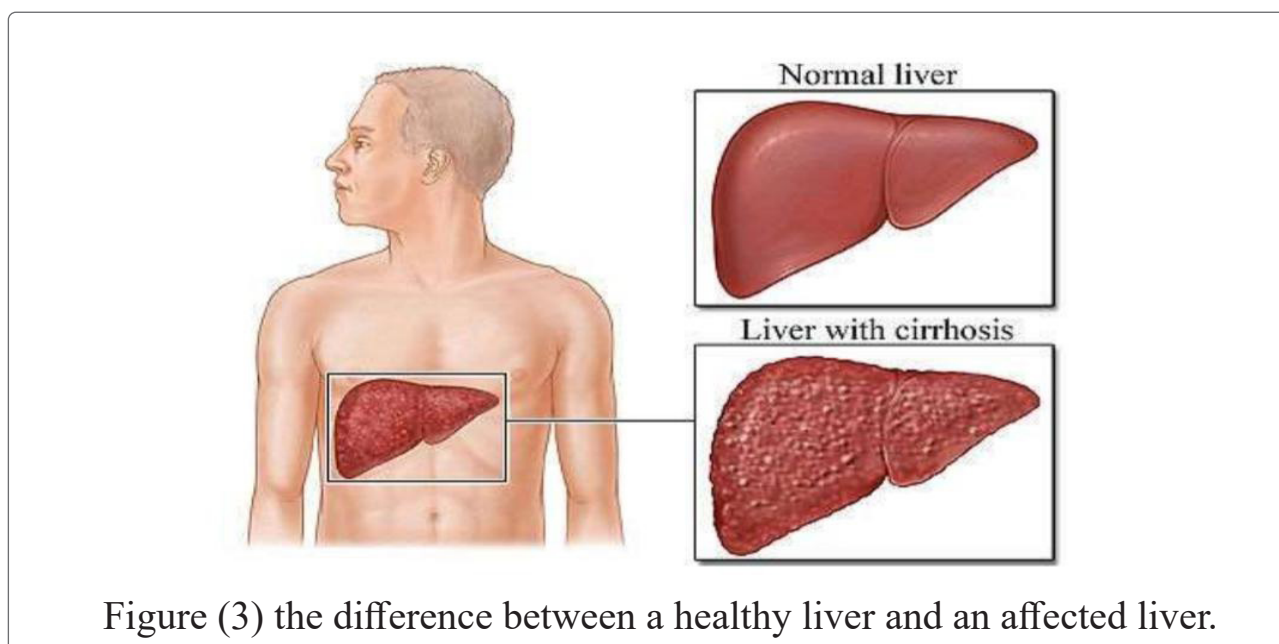


Figure (3) the difference between a healthy liver and an affected liver.

### Results and discussion

Table (1) shows the number of infections and deaths among male and female patients with liver cirrhosis in the city of Tikrit for all study years, and the results were as follows: the total number of infections was 89 in 2018, including 47 infections in males and 42 infections in females, with the number of deaths for both genders being 44. In 2019, the total number of infections reached 91, including 50 infections in

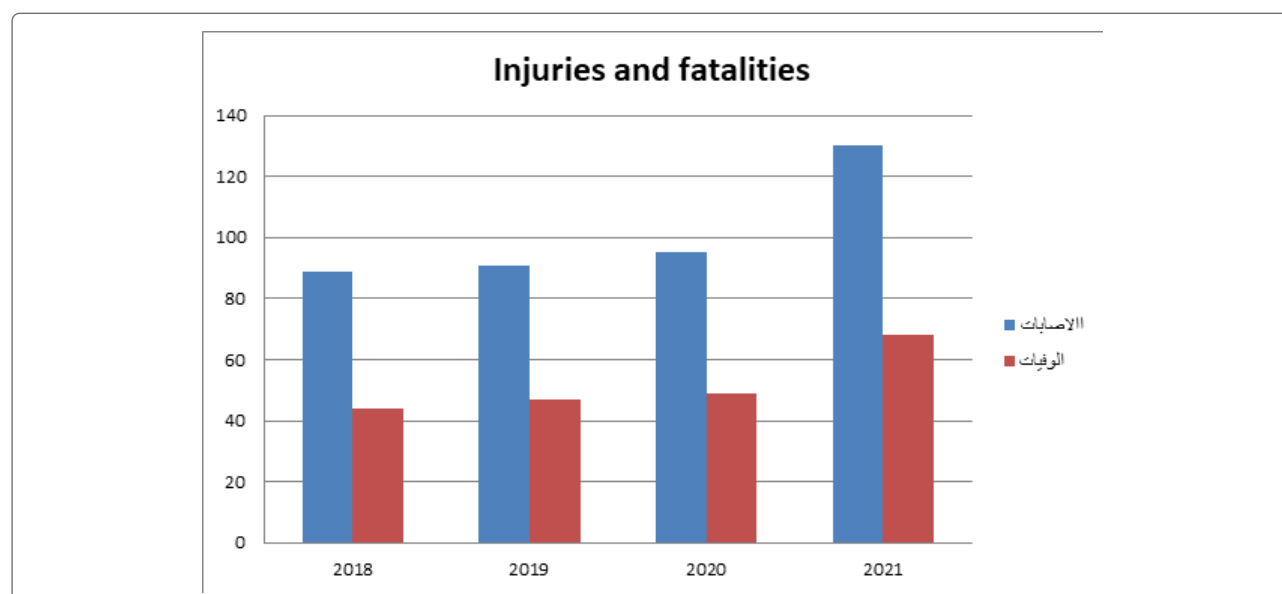
males and 41 infections in females, while the number of deaths increased from the previous year to 47 cases. In 2020, the number of infections reached 95, including 51 infections in males and 44 infections in females, while the number of deaths was 49 cases. In 2021, the number of infections became 130, including 70 infections in males and 60 infections in females, while the number of deaths increased to 68 cases.

Table (1) Number of injuries for males and females during the study years.

Number of deaths	Total number	Gender		Year
		Females	Males	
44	89	42	47	2018
47	91	41	50	2019
49	95	44	51	2020
68	130	60	70	2021

Source: Prepared by the researcher based on data obtained from Salah al-Din Hospital. Source: Prepared by the researcher based on data obtained from Salah al-Din Hospital, Salah al-Din Health Directorate in Tikrit for the period from 2018 to 2021. The year \_ Salah al-Din Health Directorate in the city of Tikrit for the period from 2018 to 2021.

Figure (1) shows that the number of injuries and deaths among all infected patients, whether male or female, increased significantly as the years progressed. The number of injuries gradually increased from the first year to the fourth year as follows: 89, 91, 95, 130. Similarly, the number of deaths also increased gradually over the study years as follows: 44, 47, 49, 68.



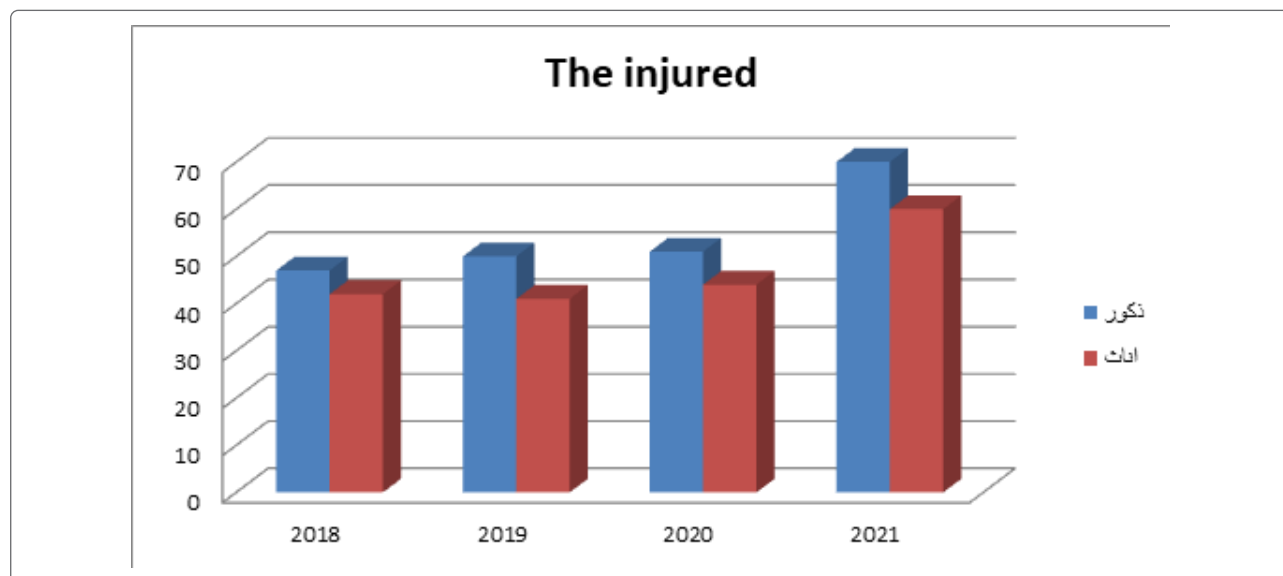
(1.4) Increase in the number of injuries and deaths over the years of the study. Source: Prepared by the researcher based on the data in Table (1.3) obtained from Salah al-Din General Hospital – Salah al-Din Health Directorate in Tikrit city for the period from 2018 to 2021.

Figure (2) illustrates the difference in the number of injuries between

males and females, as injuries among males were higher than those among females in all study years. The number of male injuries reached 47 in 2018, while female injuries were lower, totaling 42. The same was true for 2019, where male injuries amounted to 50, which was higher than female injuries, which totaled 41. In 2020, male injuries reached 51, while female injuries



were 44. In 2021, male injuries reached 70, and female injuries were also lower than male injuries, totaling 60.



Source: Prepared by the researcher based on the data in Table (1.3) obtained from Salah al-Din General Hospital – Salah al-Din Health Directorate in the city of Tikrit for the period from 2018 to 2021.

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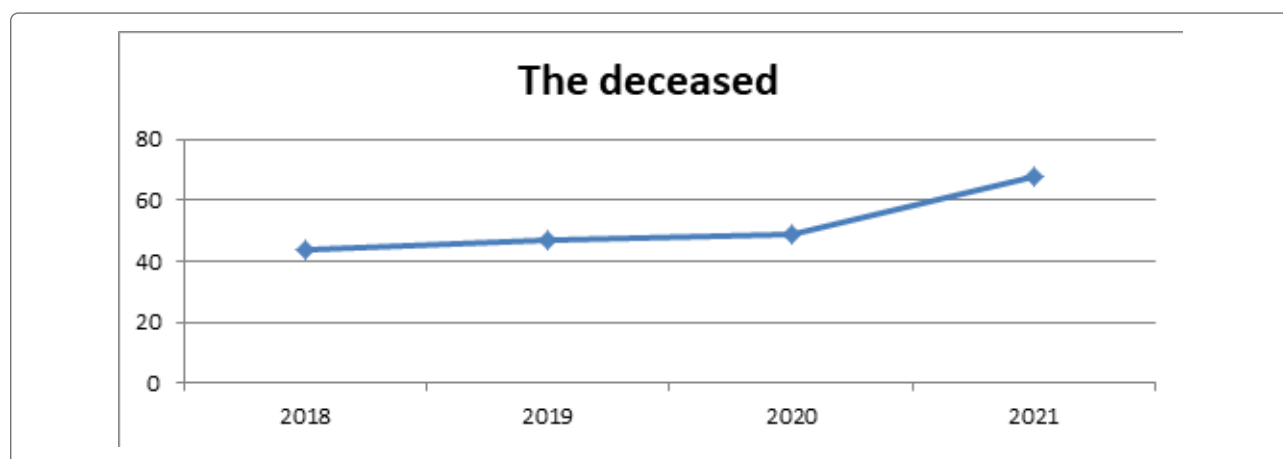


Figure (3.4) shows an increase in the number of deaths during the last years of the study. Source: Prepared by the researcher based on the data in Table (1.3) ob-

tained from Salah al-Din General Hospital – Salah al-Din Health Directorate in the city of Tikrit for the period from 2018 to 2021.

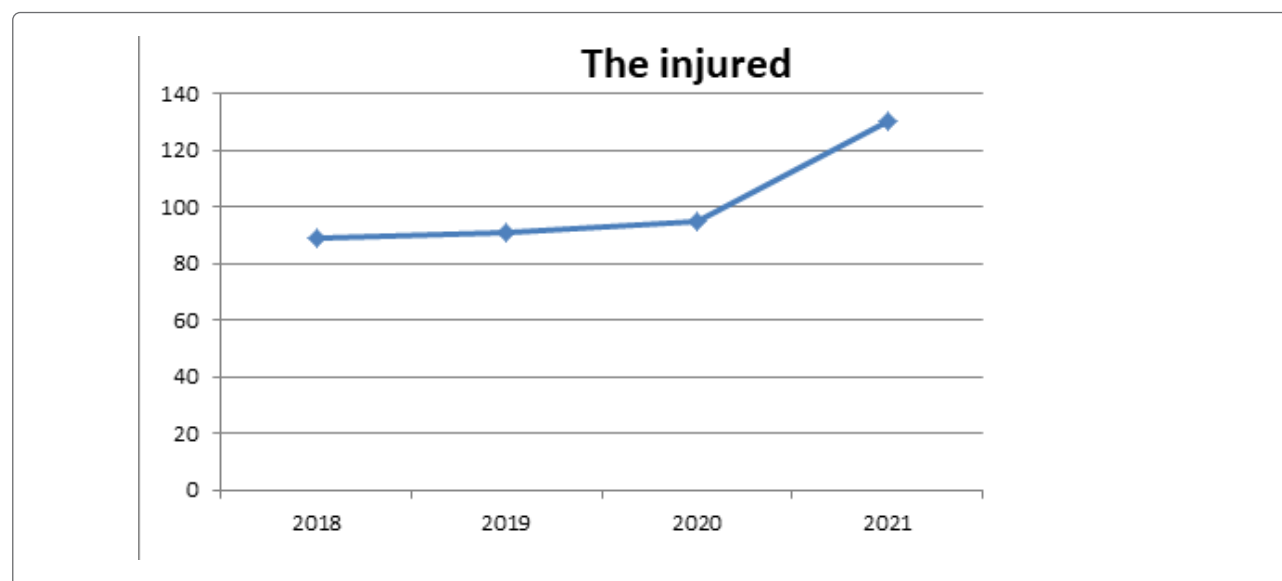


Figure (4.4) shows the worsening of injuries over the recent years of the study. Source: Prepared by the researcher based on the data in Table (1.3) obtained from Salah al-Din General Hospital – Salah al-Din Health Directorate in the city of Tikrit for the period from 2018 to 2021.

### Conclusions :

The study reached a set of results, the most important of which are:-

- There are significant differences between patients with Liver Cirrhosis (without accompanying diseases) com-

pared to those who have liver steatosis associated with other diseases such as diabetes and hypertension.

- The study revealed that there is no vaccination for Liver Cirrhosis in the city of Tikrit.

- Cirrhosis results from growth factors released by inflammatory cells and Kupffer cells, where myofibroblast-like cells, derived from Ito cells that store fat, are responsible for collagen secretion.

- The study indicated that the percentage of male children affected is higher than that of females. This may

be due to underreporting by parents in hospitals and a lack of attention to girls when they are affected by the disease, or it could be a statistical coincidence as there is no scientific or medical explanation for this case.

- The total number of patients with Liver Cirrhosis in the city of Tikrit during the period from 2018 to 2021 was approximately 398 cases.

- The total number of deaths from Liver Cirrhosis in the city of Tikrit during the period from 2018 to 2021 was approximately 208 cases.

- Patients with Liver Cirrhosis have different physiological, hormonal, and enzyme standards compared to individuals without the disease.

- The number of deaths in 2020 reached 49 cases, and in 2021 it increased to 68 cases, with notable increases in the number of deaths recorded in Salah al-Din Governorate – Tikrit, due to the population density in the governorate and the concentration of residents there.

- The total number of cases diagnosed during the study years in the city of Tikrit reached 398 cases, while the total number of deaths during the study years reached 208 cases.

## Recommendations :

Based on the results of the study, a number of recommendations have been developed and formulated to help identify the relevant situations, the most prominent of which are: -

1. Providing the necessary health awareness about cirrhosis of the liver to all segments of society by providing health and preventive programs for all infectious diseases through the media

2. Estimating the concentration of some chemical and biological parameters in cirrhotic patients with cardiovascular diseases.

3. Paying attention to awareness and public and personal hygiene by individuals and stakeholders to reduce the spread of the disease.

4. Coordinate patient registration methods within hospitals and continuously update data to access them easily and quickly from workers before and in a standardized manner.

5. Conducting a survey on the presence of cirrhosis in children.

6. Conducting some kinetic studies of liver enzymes in cirrhosis patients.

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