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HEPATITIS C IN PATIENTS WITH TUMORS, PREVALENCE AND DIAGNOSTIC METHODS

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ABSTRACT

Background: Numerous studies have proven that the correct treatment of Hepatitis c infection in patients with some types of tumors improves the prognosis of these tumors. **The aim of the study**: Titer the level of HCV antibodies in patients diagnosed with tumors and study the possible relationship between this infection and the incidence of these tumors. **Materials and methods:** This study included 64 patients who were diagnosed with different types of tumors before undergoing any treatment (chemotherapy, radiotherapy, hormonal therapy) between March 2021- October 2022 at Tishreen University Hospital, lattakia, Syria. Blood samples were taken to detect Hepatitis C infection in patients with tumors to study the relationship between them. **Results:** The study sample included 64 people, with 36 males (56.3%), and 28 females (43.7%) who were diagnosed with tumors before having any type of treatments with significant differences between the healthy and oncological groups in the distribution of HCV antibodies. So that, we can say that there is an association between hepatitis C infection and different types of tumors, but we cannot say for sure that HCV infection will inevitably lead to a tumor.

KEYWORDS: Cancer, tumors, Hepatitis C, ELISA, HCV Antibodies.

INTRODUCTION

Hepatitis C is one of the most important diseases affecting humans, and the number of people infected with it worldwide is about 120-130 million, about 3% of the world's population. According to the World Health Organization, the number of new cases diagnosed annually is about 3-4 million. Hepatitis C is considered a public health problem because of its role in the pathogenic mechanisms of chronic hepatitis, which often develops into cirrhosis of the liver and hepatocellular carcinoma HCC (Hepatic cell Carcinoma). Hepatitis C is transmitted in developed countries by misuse of syringes when intravenous drug use, while in developing countries the main source of transmission is contamination of instruments used in surgical operations and injection treatments.[1] Most untreated acute liver infections develop into chronic infections, followed by liver diseases such as cirrhosis and hepatocellular carcinoma. Both alcohol and metabolic syndrome are significant contributing factors to the progression of the incidence towards hepatosis and hepatocellular carcinoma.[2] The proportion of liver transplants following complications of hepatitis C accounts for about a third of all liver transplants annually. The hepatitis C burden is expected to increase due to the advanced age of those currently infected with it, as the incidence of cirrhosis caused by hepatitis C is expected to increase by about 31%, while the increase in hepatocellular carcinoma will be about 50%.[3] Due to the above, hepatitis C is a public health problem that needs to be dealt with from prevention policies to diagnosis and effective treatment of infected patients.

Ways of Transmission of Hepatitis C Virus

The presence of viral hepatitis C in the blood and blood products is the main source of infection, but the ways of transmission are varied and vary. Iatrogenic transmission methods include: non-test blood transfusion,[4] transfusion of coagulation factors and other blood products,[5,6] organ transplantation, reuse of surgical instruments previously used for invasive interventions (syringes, infusion sets, needles and catheters), hemodialysis, endoscopy, and intravenous administration of drugs. Sexual transmission of the hepatitis C virus is still debated in the medical literature. The transmission rate of viral hepatitis C from the expectant mother to her fetus is 4.3%, and this percentage increases in mothers with HIV to 22.1%.[7,8] Longitudinal transmission of the virus from the expectant mother to her fetus often occurs at birth, and to a lesser extent in utero if a combination of risk factors, the most important of which are high levels of the genetic material of the virus and/or co-infection of the acquired immunodeficiency virus (HIV), synergize. Natural childbirth in comparison with cesarean section,

amniocentesis and breastfeeding increase the transition rate

Diagnosis
Several diagnostic tests based on serum and DNA of the virus have been developed. Serological examinations are sufficient when chronic viral hepatitis C is suspected with a sensitivity of up to 99%. Positive serological tests require RNA titration of the virus or measurement of antigen (less sensitive) to differentiate chronic inflammation from previous infection. Serological titrations alone are not enough when acute viral hepatitis C is suspected because the development of mature antibodies occurs after infection. It does not rely on morphological examinations such as histological immunological staining, localized hybridization or PCR of liver samples in the diagnosis of viral hepatitis due to their sensitivity and low quality compared to methods based on antibodies and RNA detection of the virus.

❖ Hepatitis C Virus Pulpous Antigen Assay
A quantitative method for titration of the pulpous antigen of hepatitis C virus (Architect HCV Ag, Abbot diagnostic) has been recently approved. This titration involves targeting five antibodies to the pulpous antigen of the hepatitis C virus. This test has a high quality (99.8%) and with the same effectiveness for heterogeneous genotypes of the virus, it has a high sensitivity in quantifying the incidence of chronic viral hepatitis. The pulpous antigen correlates well with the serum RNA levels of the virus but this correlation is not completely linear and this is what may lead to false negativity in immunocompromised patients.[9,10] Some studies have shown the possibility of relying on titration of pulpous antigen levels as an alternative to titration of viral RNA in monitoring the response to antiviral therapy.[11]

❖ Hepatitis C virus DNA testing
Since RNA levels become detectable within several days of infection, its investigation is one of the steps for early diagnosis of acute viral hepatitis C. The investigation of the RNA of the virus is useful in determining its genotype, choosing a treatment strategy, duration of treatment and evaluating the effectiveness of the applied therapy.[11] Both quantitative and qualitative methods of virus RNA titration using PCR technology are available. Qualitative methods are characterized by high sensitivity and are used for the initial diagnosis of viral hepatitis C, especially in liver donors. Quantitative methods based on rt-PCR are able to detect a very wide range of the nuclear material of the virus ranging from 10-10 million UI/mL. This feature is important when investigating the effectiveness of treatment in the event that the decrease in viral load is severe.

❖ Genotyping of Viral Hepatitis C
Genotyping of the hepatitis C virus is mandatory for every patient who will undergo antiviral therapy.[12]

Study Design
Observational Cross-Sectional Study.

Objectives
Titer the level of HCV antibodies in patients diagnosed with tumors and study the possible relationship between this infection and the types of these tumors. In addition, studying the possible relationship between tumors and the development of the disease.

Sample Characteristic
This study included 64 patients who were diagnosed with different types of tumors before undergoing any treatment (chemotherapy, radiotherapy, hormonal therapy) between March 2021- October 2022 at Tishreen University Hospital, lattakia, Syria.

MATERIALS AND METHODS
All blood sample were preserved in EDTA – tubes and were thickened to obtain plasma, the plasma was separated and transferred to Eppendrof tubes and kept at a suitable temperature of -60°c.

The following tests were used :
- Ziehl-neelsen stain
- Lowenstein-Jensen transplantation Jensen
- ELISA PCR in real time

Statistical Analysis
o Statistical analysis were conducted using the Statistical Package for the Social Sciences (SPSS), version 26.
o Graphic forms and tables were used in the characterization of values. Averages, Standard Deviations and Central Tendency Measures were used to characterize quantitative data.
o The Mann-Whitney U-test was used to compare arithmetic averages. Use The Chi-square test (chi-square test) to compare the percentages of categorical variables between the studied groups. The differences at the p-value threshold below or equal to 0.05 were considered statistically significant.

RESULTS
### 1. Distribution of the Sample According to Gender
The study sample included 64 people, with 36 males (56.3%), and 28 females (43.7%). As shown in the following table:

Table 1: Distribution According to Gender.

Cumulative Percentage	Percentage %	N	Tumor Type
9.4	9.4	6	Prostate
10.9	1.6	1	Peritoneal
12.5	1.6	1	Pharynx
46.9	34.4	22	Breast
53.1	6.3	4	Larynx
54.7	1.6	1	Testes
59.4	4.7	3	Brain
73.4	14.1	9	Lung
76.6	3.1	2	Sarcoma
78.1	1.6	1	Uterus
79.7	1.6	1	Kidney
87.5	7.8	5	Colon
90.6	3.1	2	Ovary
92.2	1.6	1	Bladder
93.8	1.6	1	Oesophagus
95.3	1.6	1	Rectum
100.0	4.7	3	Stomach
	100.0	64	Total

2. Distribution of the Study Sample According to Age

The sample included 64 patients whom age ranged between 22-83 years with an average of 53.12 ± 11.078. (Figure 1)
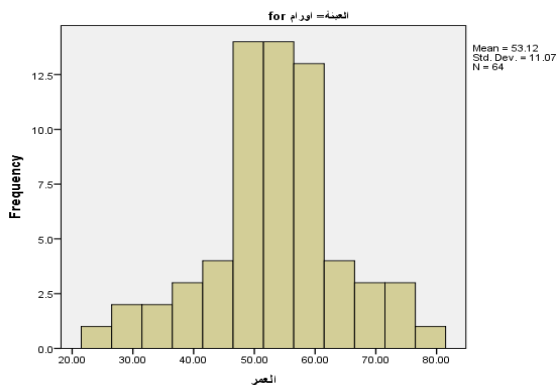
3. Distribution of HCV Antibodies in Patients Tumor Population

The study sample included 64 patients, where the number of antibody-negative 59 patients was 92.2%, while the number of positive 5 patients was 7.8%. When we distributed the negative and positive HCV antibodies from the sample of oncological patients for both sex and age, it turned out that the P-value values are respectively 0.709, 0.716, which is higher than the limit value of 0.05, and therefore there are no significant differences between the sexes in terms of the distribution of HCV antibodies, and there are no significant differences between the age groups in terms of the distribution of antibodies. For tumor types, the following table shows the distribution of HCV antibodies in patients with percentages for each group so as to ensure the negative and positive ratios for the antibodies.

Table 2: Distribution of HCV Antibodies in Patients Tumor Population.

Total	HCV Antibodies		Tumor type	
	Positive	Negative		
6	1	5	N	PROSTATE
9.4%	20.0%	8.5%	%	
1	1	0	N	PERITONEAL
1.6%	20.0%	0.0%	%	
1	0	1	N	PHARYNX
1.6%	0.0%	1.7%	%	
22	2	20	N	Breast
34.4%	40.0%	33.9%	%	
4	0	4	N	Larynx
6.2%	0.0%	6.8%	%	
1	0	1	N	Testes
1.6%	0.0%	1.7%	%	
3	0	3	N	Brain
4.7%	0.0%	5.1%	%	
9	0	9	N	Lung

14.1%	0.0%	15.3%	%	
2	0	2	N	**Sarcoma**
3.1%	0.0%	3.4%	%	
1	0	1	N	**Uterus**
1.6%	0.0%	1.7%	%	
1	0	1	N	**KIDNEY**
1.6%	0.0%	1.7%	%	
5	0	5	N	**Colon**
7.8%	0.0%	8.5%	%	
2	0	2	N	**Ovary**
3.1%	0.0%	3.4%	%	
1	0	1	N	**Bladder**
1.6%	0.0%	1.7%	%	
1	0	1	N	**Oesophagus**
1.6%	0.0%	1.7%	%	
1	0	1	N	**Rectum**
1.6%	0.0%	1.7%	%	
3	1	2	N	**Stomach**
4.7%	20.0%	3.4%	%	
64	5	59	N	**Total**
100.0%	100.0%	100.0%	%	

DISCUSSION
The study sample included 64 people, with 36 males (56.3%), and 28 females (43.7%) who were diagnosed with tumors before having any type of treatments.

When performing the Mann-Whitney test, it turned out that the P-value is less than 0.05 and therefore we say that the differences in ranks are a statistical function. That is, there are differences between the healthy and oncological groups in the distribution of HCV antibodies.

Thus, we can say that there is an association between hepatitis C infection and different types of tumors, but we cannot say for sure that HCV infection will inevitably lead to tumors, and this is consistent with most international studies.[13,14,15]

CONCLUSION AND RECOMMENDATIONS
- ❖ It is recommended to use Real time PCR as a sensitive and qualitative rapid diagnostic method in the diagnosis of Mycobacterium Tuberculosis.
- ❖ Suggestion to replace the traditional methods used in the diagnosis of tuberculosis with polymerase chain reaction PCR in real time, especially in the diagnosis of extrapulmonary Tuberculosis.

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