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Original article

DETERMINANTS OF HEPATOCELLULAR CARCINOMA IN CLINICAL ONCOLOGY AND NUCLEAR MEDICINE DEPARTMENT IN ZAGAZIG UNIVERSITY HOSPITALS: A RETROSPECTIVE ANALYSIS OF 538 CASES

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ABSTRACT

Background: Hepatocellular carcinoma (HCC) is one of the most common malignant tumors in the world and it`s prevalence in Egypt has been rising in the last few years. The aim was to study determinants of HCC in Clinical Oncology and Nuclear Medicine Department in Zagazig University Hospitals.

Methods: This is a retrospective chart review of 538 patients with HCC conducted from 2012 to 2017. Analysis of data in files was done to study the determinants of HCC.

Results: The majority of cases (77%) were male, about 71.7% of patients were from urban areas. Age of majority of cases was in 50s (40%). (99.71%) of patients were of cirrhotic liver. HCV antibody was detected in serum of (89.92%) of studied cases while hepatitis B virus infection was detected in only (3.10%) of cases.

Conclusion: HCC is a major health problem in Zagazig and its incidence is increasing. The high prevalence of HCV infection makes screening programs and following up of HCV patients is a very important tool for early detection of mild HCCs cases.

Keywords: HCC, Cirrhosis, HCV and HBV.

INTRODUCTION

HCC is the fifth most common cancer in the world and the third cause of cancer mortality [(1), (2)]. There were nearly 782000 HCC diagnosed cases all over the world in 2012; most of cases were diagnosed in developing countries [(3)]. There is a difference in the age around which HCC is diagnosed which depends on sex, residence, and exposure to certain risk factors leading to cancer development. At the age of sixty, the most common cause of HCC development is chronic liver diseases (CLD) including chronic infection by hepatitis C virus (HCV) and Hepatitis B virus (HBV) .Moreover, congenital liver disorders are the most common causes of HCC in children and adolescents, generally females are diagnosed at age older than that of males [(4)].HCC in Egypt is linked to HCV related cirrhosis more than non-viral causes of CLD, Egypt has the highest infection by HCV in the world (genotype 4 is the most common type), which has been caused by public health plans for treatment of patients infected by schistosomiasis [(5)] .

To study the determinants of HCC in Zagazig, we comprehensively analyzed patients with HCC from 2012 to 2017 with regard to their age, sex, residence, laboratory and radiological profile.

PATIENTS AND METHODS

This is a retrospective chart review of HCC patients done in the period from January 2012 to December 2017 for those who attended Clinical Oncology and Nuclear Medicine department in Zagazig University Hospitals.

Minimum data set within the patient record was predefined before collection of data to include a record in this retrospective study. HCC cases in Clinical Oncology and Nuclear Medicine in Zagazig University Hospitals were diagnosed according to American Association for the

Study of Liver Diseases (AASLD) practice guidelines [6].

Written informed consent was obtained from all participants and the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University.

STATISTICAL METHODS

Data analysis was performed using IBM SPSS statistics. Mean and Standard Deviation were used for quantitative parametric measures, Median Percentiles for nonparametric ones and both number and percentage for categorized data.

RESULTS

The demographical data of HCC cases was presented in table 1. As for age, it was observed that most of cases were in their 50s (40%), male to female ratio was 3:1 and nearly 72.1% of cases were from urban areas.

As regard to laboratory (HCV, HBV) and radiological data (cirrhosis) of studied patients. It was noticed that in the majority of cases (89.96%), HCV was positive while only 3.15% of patients had positive HBV results. About 99.07% of patients had cirrhotic liver as detailed in table2.

Table1. Demographic data of HCC patients in Zagazig

Age **M ± SD**	60.2 ± 8.9	
Median	60.0	
Age category		
21-30	2	0.37%
31-40	9	1.67%
41-50	62	11.5%
51-60	216	40%
61-70	188	34.9%
71-80	57	10.6%
81-90	4	0.74%
Sex		
Males	416	77%
Females	122	23%
Residence		
Urban	388	72.1%
Rural	150	27.8%

Table2. Viral markers and radiological (cirrhotic) data of the studied patients

Viral markers		%
HCV+	484	89.96%
HCV-	29	5.39%
HBV+	17	3.15%
HBV-	108	20.07%
HCV+/HBV+	13	2.41%
HCV-/HBV+	4	0.74%
HCV-/HBV-	8	1.48%
HCV+/HBV-	100	18.59%
Cirrhotic liver	533	99.07%
Non cirrhotic liver	5	0.93%

DISCUSSION

HCC is the most common primary liver malignancy. Incidence is rising and HCC has increased to become the fifth most common type of cancer in the world and the 3rd leading cause of cancer mortality [7]. There is wide spreading of HCC all over the world including both developed and less developed countries like Egypt which is related to HCV transmission by the reuse of needles for injection of tartar emetic to get rid of schistosomiasis back in 1950 and until thirty years after [8].

HCC was observed in nearly 4.7% of chronic liver disease cases in Egypt [9].

In 2005, El-Zayadi et al., noticed a very high rise in the percentage of HCC among chronic liver disease patients (from 4% to 7.2%) in more than a decade [10].

This rise may be related to the increase of risk factors such as hepatitis C and B virus infection as well as the improvement of the screening programs and methods of diagnosis [11].

The current work was done to study the determinants of HCC in clinical oncology and nuclear medicine in Zagazig University Hospitals patients with HCC.

In this study, age of HCC cases was 60.2 ± 8.9 years with a median age of 60 years. The highest rates were noticed at ages between 51 and 70 years (50s then 60s). Similarly, 56 years old was the median age of Egyptian HCC cases according to Mohamed et al., also 52 years old was the median age of HCC cases included in a study conducted by Kumar et al.[12], [13]. According to Bosch, HCC development probability rises with age [14]. HCC is not common before 40s in western people. Most of HCC cases according to some Indian studies were in 60s and 70s as and this is compatible with this study [15].

Percentage of males in all age groups was higher than females in most populations with an average male to female proportions between 2:1 and 4:1 [16].

In the present study, 3:1 was the male to female ratio which is compatible with most records. Exposure of men in some areas to certain risk factors makes them more susceptible than women to HCC development.

For example, men working as farmers in rural areas in Egypt were more susceptible to be infected by HCV during eradication of bilharziasis which is a major risk factor for development of liver cirrhosis and HCC [8]. In this study, majority of patients (72.1%) were from urban areas and only 27.8% of patients were from rural areas as population from urban areas seek medical advice and more concerned with health issues and may be also related to that patients tend to tell the nearest urban areas instead of their real rural residence.

In this study, 89.96% of patients were infected by HCV, 3.15% by HBV, 2.41% by both HBV and HCV together and 1.48% of patients were free of viral infection. Mohamed et al. noticed in their study that HCV has a high prevalence as HCV was presented in 64.4%

and HBV was in only 17.5% while combined infection was detected in 11.2% [12].

High prevalence of HCV was the main cause for increasing HCC prevalence [17]. Nearly 14% of Egyptian people were infected by HCV [18]. HCV causes HCC through both cirrhosis and viral mutagenic effect on hepatocytes [19]. In this study 89.96% of patients were infected by HCV.

According to El-Zayadi et al. study which was applied from the beginning of 1993 to the end of 2002, 86.9% of HCC Egyptian patients were infected by HCV and 28.4% of them were infected by HBV, they also observed that there was a decrease in HBV proportion, increase in HCV proportion and decrease in proportion of both HCV and HBV together. They clarified that HBV infection decreased due to good measures taken in consideration for safe blood transfusion applied within the mid-1970s and somewhat due to the development of HBV infection with some sort of mutation, which needs high costly diagnostic tests [10]. In this study HCV related HCC incidence rate is much higher than that of HBV this may be related to HBV immunization programs. In this study, viral markers were -ve in 1.5% of cases. About 14.5% of HCC cases who were included in El-Serag study having non cirrhotic liver and without specific risk factors [17]. This could be due to exposure to risk factors like aflatoxins, excess alcohol intake or DM. Bilharziasis is still acting a great role in HCC development [20]. In Egypt, Bilharziasis is a major health problem and infection with Schistosoma mansoni acts the major role in development of liver disease. In the period between 1950 to 1980, public health programs for getting rid of bilharziasis by injection of tartar emetic using contaminated needles led to wide spread of HCV infection predominantly genotype 4 [21]. There is a proof that bilharziasis and hepatitis C virus infection together can cause more serious complications like development of early portal hypertension with rapid progression to fibrosis and liver cancer, this occurs quicker than in cases that do not have a bilharzial parasite infection [5].

CONCLUSION

It is concluded that hepatocellular carcinoma is a major health problem in Zagazig and its incidence is increasing. The high prevalence of HCV infection makes screening programs, and the surveillance of those patients represents a very important tool for early detection of small HCCs cases. Further studies focusing on risk factors other than viral infections are warranted.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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