FREQUENCY OF HEPATOMA IN CIRRHOTIC PATIENTS IN LOCAL POPULATION USING TRIPHASIC CT SCAN AS DIAGNOSTIC TOOL

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ABSTRACT

Objective: To determine frequency of hepatoma among cirrhotic patients using triphasic CT scan as diagnostic tool.

Methodology: A cross sectional study was conducted at Department of radiology, Kuwait teaching Hospital, Peshawar. Study duration was 6 months (July 2017- December 2017). Sample size of 288 patients was calculated using WHO calculator. Non probability consecutive sampling was used. Triphasic CT scan is used for diagnosis of Hepatoma. SPSS version 22.0 was used for data analysis. Chi-square test was applied to determine association between different variables. p value ≤0.05 considered significant

Results: Total 288 patients were included in study. There were 159(55%) males and 129(44%) females in study. Mean age of patients was 54.4±12.2SD. Among all the patients 288(100%), 142 (49%) were diagnosed with hepatoma while 146(51%) were diagnosed with other diseases. Higher frequency of hepatoma was found among males (p=0.01) and patients age > 40 years (p=0.000). A significantly high proportion of hepatoma patients were HCV positive (p=0.000) as compared to HCB (p=0.05).

Conclusion: Frequency of hepatoma is as high as 49% in local population using triphasic CT scan. HBV and HCV are leading causes of hepatoma. Early diagnosis using dynamic imaging is essential for potential identification and characterization of HCC.

Key words: Hepatoma, cirrhosis, Triphasic CT scan, Hepatitis C virus

INTRODUCTION

Hepatocellular carcinoma is 3rd major cause of cancer related mortality, worldwide[1]. Hepatocellular carcinoma (HCC) is ranked as 6th most common cancer. HCC is primary liver cancer that occurs secondary to chronic viral hepatitis[2]. Out of all HCC cases worldwide, three quarters are reported in Asia. Pakistan had highest burden of chronic viral hepatitis leading towards hepatocellular carcinoma and liver failure[3]. Literature showed that hepatitis C is most common cause of hepatocellular carcinoma in 58% of patients in Pakistan[4].

Early detection of HCC is a potentially important factor for improved outcome. Early disease patients are usually asymptomatic and most frequently diagnosed later. However, patients with liver cirrhosis having encephalopathy & jaundice are at high risk of developing HCC[5]. HCC patients most commonly present with weight loss, severe upper abdominal pain, diarrhea, palpable mass, early satiety, bone pain, severe intraperitoneal bleeding, dyspnea and paraneoplastic syndromes. Imaging tests are most favorable procedures for early detection and diagnosis of HCC according to European Association for the Study of Liver Disease (EASL)[6].

Currently, ultrasonography is used as screening modality for patients at high risk of developing HCC. However, magnetic resonance imaging (MRI) & dynamic/ multiphase contrast enhanced CT (computed tomography) are standard diagnostic techniques for detection of HCC. A Preferred CT technique for detection of HCC is Triphasic spiral CT due to high quality lesion differentiation and characterization. Triphasic spiral technique is very effective for imaging entire liver in arterial, portal and equilibrium phases. However imaging is usually conducted at different intervals corresponding to contrast phase enhancement following rapid intravenous infusion of contrast[7].

Hafeez et al. reported that triphasic CT scan technique is an important non invasive technique for differentiation of liver benign lesion from liver malignant lesions. They reported 100% sensitivity and 80% specificity of triphasic CT scan for HCC diagnosis[8]. Leeuwen et al. reported that triphasic liver CT scans helps to characterize most frequently occurring focal liver lesions. HCC appeared heterogeneous on CT scan mostly, leading towards reflection of intra-tumoral fibrous stranding, necrosis, fatty metamorphosis and calcification. Miller et al. reported that triphasic CT scan is very effective in detection and characterization of focal

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hepatic lesion among patients with neoplasms[9].

Data available on frequency of hepatoma in cirrhotic patients is inadequate to reach any conclusion. Thus, present study aims to determine frequency of hepatoma among cirrhotic patients using triphasic CT scan as diagnostic tool.

MATERIAL & METHODS

A cross sectional study was conducted at Department of radiology, Kuwait teaching Hospital, Peshawar. Study duration was 6 months (July 2017- December 2017). A sample size of 288 patients was calculated using WHO calculator with prevalence 25%10, level of significance 5% and confidence interval 95%. Non probability consecutive sampling was used for recruitment of patients. Ethical approval was taken from ethical review board of hospital. Consent forms were taken from participants. Patients aged greater than 18 years of both genders and patients suspected for focal hepatic lesions were included. Patients with other focal benign and inflammatory lesions, history of chronic renal failure (CRF), pregnant and breast feeding mothers were excluded from study. Triphasic CT scanning of liver was performed using 16 slice Philips CT scanner. Patients were given 1.5ml/kg of intra venous contrast with overall dose ranging from 80 to 100ml. According to department protocols, patient's preparation through administration of 2000 ml of water or gastrograffin as oral contrast is used before 30-60 minutes of examination. After that patients liver were scanned in arterial, portal and equilibrium phases with scanning delay 20-40 seconds, 60-90 seconds and 2-5 minutes respectively. On basis of triphasic CT scan, hepatomas show hyperenhancement in arterial phase, Iso/mixed enhancement in porto-venous phase and iso/mixed enhancing pattern in equilibrium phase. Data was analyzed using SPSS version 22.0. Mean & standard deviation were calculated for quantitative data like age. Frequency and percentages were calculated for gender, HCC, alternate diseases, alternate tumors and cause of HCC. Effect modifiers like age and gender were controlled by stratification. Post stratification chi square test was applied. P value < 0.05 was considered significant.

RESULTS

Total 288 patients were included in study. There were 159(55%) males and 129(44%) females in study. Mean age of patients was 54.4±12.2SD. There were 42(15%) patients in 18-40 years age group while 246(85%) patients were in age group >40 years. There were 23(8%) hepatitis B virus positive patients while 265(92%) were negative. However, 94(33%) patients were hepatitis C virus positive while 194(67%) were virus negative. Among all the patients 288(100%), 142 (49%) were diagnosed with hepatoma while 146(51%) were diagnosed with other diseases (Figure 1)

Patients diagnosed with other alternative diseases were portal vein thrombosis 1(0.3%), chronic liver disease 146(50.7%), metastasis 14(4.9%), hemangioma 19(6.6%), liver metastasis 13(4.5%), hydatid cyst 9(3.1%), liver abscess 5(1.7%), dysplastic nodule 3(1.0%), biliary cystadenoma 1(0.3%), exophytic lesion 1(0.3%), hepatic deposits 3(1.0%), abscesses 4(1.4%), simple cysts 2(0.7%), cholangitis 1 (0.3%), cholecystitis 1(0.3%), cholelithiasis 3(1.0%), benign hepatic and pancreatic lesions 4(1.4%), Budd-chiari syndrome 1(0.3%), ascites 2(0.7%). Tumors other than hepatoma were renal tumors 3(1.0%), cholangiocarcinoma 5(1.7%), gall bladder tumors 4(1.4%), bronchogenic carcinoma 1(0.3%), lymphadenopathy 1(0.3%), adrenal hemorrhages 2(0.7%), lymphoma 1(0.3%), breast carcinoma 3(1.0%), rectal carcinoma 1(0.3%), primary unknown tumors 4(1.4%), pancreatic tumors 13(4.5%), common bile duct tumor 1(0.3%), urinary bladder tumor 1(0.3%), esophageal mass 2(0.7%), stomach tumor 3(1.0%), pulmonary metastasis 2(0.7%), sigmoid colon tumor 1(0.3%), and bone metastasis 1(0.3%).

Among all the males 159(31.9%), 92(31.9%) were diagnosed with hepatoma while 67(23.3%) were diagnosed with tumors other than hepatoma. Similarly, among all the females 129(44.8%), 50(17.4%) had hepatoma while 79(27.4%) were not diagnosed with hepatoma. Frequency of hepatoma was more significant among males as compared to females (x^2 =10.397, p=0.01, df =2). Among all the patients who were in age group 18-40 years 42(14.6%), 6(2.1%) had hepatoma while 36(12.5%) were not diagnosed with hepatoma. Similarly among all those who were in age group >40 years, 136(47.2%) had hepatoma while 110(38.2%) were not diagnosed with hepatoma. A significantly high proportion of hepatoma was found in age group > 40 years (x^2 =324.126, p=0.000, df =2) as shown in table 1.

Among all the patients diagnosed with hepatoma 142(49.3%), 16(5.6%) were HBV positive while 126(43.8%) were HBV negative. Similarly, among all those who were not diagnosed with hepatoma 146(50.7%), 7(2.4%) were HBV positive while 139(48.3%) were HBV negative (x^2 =4.105, p=0.05, df =2). Among all the patients diagnosed with hepatoma 142(49.3%), 71(24.7%) were HCV positive while 71(24.7%) were

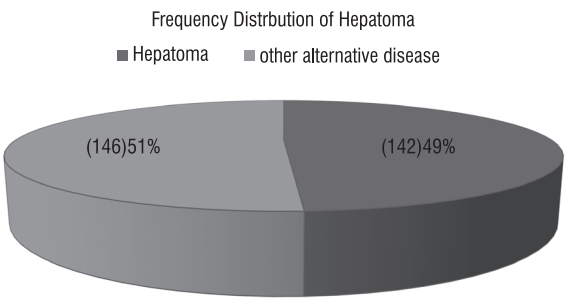

Figure 1: Frequency Distribution of hepatoma

Table No 1: Association between gender, age & hepatoma

Gender	Hepatoma		Total	Chi-square	P value
	No	Yes			
Male	67(23.3%)	92(31.9%)	159(55.2%)	10.397	0.01
Female	79(27.4%)	50(17.4%)	129(44.8%)		
Total	146(50.7%)	142(49.3%)	288(100%)		
Age					
18-40 years	36(12.5%)	6(2.1%)	42(14.6%)	24.126	0.000
>40 years	110(38.2%)	136(47.2%)	246(85.4%)		
Total	146(50.7%)	142(49.3%)	288(100%)		

Table No 2: Association between HCV, HBV and Hepatoma

HBV	Hepatoma		Total	Chi-square	P value
	No	Yes			
Negative	139(48.3%)	126(43.8%)	265(92.0%)	4.105	0.05
Positive	7(2.4%)	16(5.6%)	23(44.8%)		
Total	146(50.7%)	142(49.3%)	288(100%)		
HCV					
Negative	123(42.7%)	71(24.7%)	194(67.4%)	38.401	0.000
Positive	23(8.0%)	71(24.7%)	94(32.6%)		
Total	146(50.7%)	142(49.3%)	288(100%)		

HCV negative. Similarly, among all those who were not diagnosed with hepatoma 146(50.7%), 23(8%) were HCV positive while 123(42.7%) were HCV negative (x^2 =38.401, p=0.000, df =2). A significantly high proportion of hepatoma patients were HCV positive (p=0.000) as compare to HCB (p=0.05).

DISCUSSION

Hepatocellular carcinoma is a primary malignant hepatic lesion. Patients with chronic hepatic parenchymal diseases are more prone to develop HCC[11]. Early diagnosis of HCC is associated with better care and treatment modalities for patient. A strong negative correlation exists between diagnostic delay and prognosis of HCC[12].

In present study, total 288 patients were included. There were 159(55%) males and 129(44%) females in study. Mean age of patients was 54.4±12.2SD. Among all the patients 288(100%), 142 (49%) were diagnosed with hepatoma while 146(51%) were diagnosed with other diseases. Kanwal et al reported that frequency of HCC in United States increases from 9% to 18.5% in 10 years[13]. Mittal & Serag reported frequency of HCC as high as 65% as a result of data base surveillance[14]. Tariq et al reported frequency of HCC in Karachi 5.7%[15].

In present study, frequency of hepatoma was more significant among males as compared to females (x^2 =10.397, p=0.01, df =2). Serag & Meson reported that a higher incidence of HCC was found among dark skinned males as compared to light skinned females (p>0.05)[16]. Another similar study reported that prevalence of HCC was high among males as compared to females[17].

Present study reported a significantly high proportion of hepatoma in age group > 40 years (x^2 =324.126, p=0.000, df =2). Tan et al. reported that overall survival with HCC was lower (p<0.05) among older age patients (>70 years) than younger patients[18]. Butt et al. reported that frequency of hepatoma was relatively high among patients aged 50-60 years in comparison to younger patients (p=0.00)[6].

Present study reported that a significantly high proportion of hepatoma patients were HCV positive (p=0.000) relative to HCB (p=0.05). Yoshizawa reported 80% of HCC patients were HCV positive indicating HCV a leading risk for hepatoma development[19]. Shi et al reported that HBV positive patients are 15 to 20 times more prone to develop hepatoma than uninfected individuals[20]. Donato et al. reported that HCV positive patients are 17 times more likely to develop hepatoma as compared to HBV[21].

Limitation

Study center was a referral centre in Peshawar. So frequency of hepatoma might be overestimated limiting generalizability of study.

CONCLUSION

Frequency of hepatoma is as high as 49% in local population using triphasic CT scan. HBV and HCV are leading causes of hepatoma. Early diagnosis using dynamic imaging is essential for potential identification and characterization of HCC.

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