

Sonographic Findings in patients of Hepatitis B & C

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ABSTRACT

Background: Role of Ultrasound into Acute Viral Hepatitis is inadequate for excluding jaundice surgical reasons. Though, here are definite features of ultrasound that may assist us for expect acute viral hepatitis in preliminary only some days previous to clinical jaundice onset.

Aim: To determine the sonographic findings in patients of Hepatitis B and Hepatitis C.

Methodology: A descriptive study was conducted at The university of Lahore Teaching Hospital Lahore after Ethical Review Board approval at university of Lahore faculty of Allied Health sciences, Lahore. On the basis of diagnosis inclusion criteria were included adult patients of both genders for abdominal ultrasound. And patients who are willing to participate. In exclusion Criteria excluded the Patient present with any known pathologies. Collection of data was done by the help of convenient technique of sampling according to gender, age as well as sonographic findings of patients with acute viral hepatitis B & C.

Results: Out of total number of 162 patients, 129(79%) were males and 33(20%) were females, 94(58%) patients had fever and 68(42%) had no fever. Out of total number of 162 patients, 57(35%) patients had positive Hepatitis B, 105(64%) had negative, 73(45%) patients had positive Hepatitis C, 89(54%) had negative, 67(41%) patients alter liver parenchymal echotexture, 68(42%) had coarse liver echotexture and 27 (16%) had normal homogenous echotexture. 63(38%) patients had irregular margins of liver and 99(61%) had regular margins of liver. 63(39%) had chronic liver disease, 25(15%) had hepatomegaly and 74(45%) had normal size.

Conclusion: From our study, we concluded that cirrhosis of liver related with Hepatitis B and Hepatitis C virus more ordinary within man than woman. Cirrhosis of liver related with Hepatitis B and Hepatitis C virus are majorly affect the rural areas.

Keywords: Hepatitis B & C, Ultrasonography, Chronic liver disease, Jaundice, liver parenchymal disease.

INTRODUCTION

Major causes of liver diseases in the world are Hepatitis B and Hepatitis C viruses. Virtual significance of Hepatitis B and Hepatitis C virus infections diverges significantly as of part of world to each other as well as alters over time¹.

Sero-prevalence of surface antigens of Hepatitis B virus and antibodies of Hepatitis C virus is about 2.5% and 4.8% correspondingly, among taken as a whole disease rate of 7.6% in common people.² Hepatitis B and Hepatitis C virus can emerge like co-infection because of same transmission mode. Numerous studies renowned that Hepatitis B and Hepatitis C virus co-infection accelerate the progression of disease of liver as well as boost hepato-cellular carcinoma risk moreover patients require elevated dosage of treatment of interferon. In prevalence of HCV (5%) Pakistan has second highest number after Egypt moreover the people suffering from HCV has second highest number after China. Survey of general prevalence of population of 2.5% for HBV and 4.9% for HCV reported in 2007 to 2008, correspondingly. Punjab has highest burden of hepatitis at provincial level³.

Analysis of Fibrosis as well as Cirrhosis in patients of liver among persistent hepatitis virus is of prognostic and therapeutic significance. While histological assessment of per-cutaneous Biopsy specimen is gold measure of Fibrosis as well as Cirrhosis severity, Biopsy is persistent moreover cannot be utilized frequently in follow up. Furthermore, Biopsy of liver may yield false negative results in about 20-30% of cases.⁴ Hence, it is significant for usage non-invasive techniques within discrimination among Fibrosis as well as Cirrhosis of liver⁵.

Both Hepatitis B and Hepatitis C virus have a tendency elect a-symptomatic until afterward periods.⁶ Hepatitis B and Hepatitis C virus can finish within cancer, Fibrosis as well as Cirrhosis of liver. Hence, this description argues Hepatitis B and Hepatitis C virus individually, as well as recognizes split serious aspects to support their eradication.⁷ Ultrasonography is a non-invasive as well as inexpensive process diagnoses central as well as disperse parenchyma liver disease. Though Ultrasonography cannot identify tiny alterations, we carried out eventual study for evaluating

Ultrasonography strength to diagnose liver Fibrosis among persistent hepatitis of liver with no biochemical and clinical confirmation of Cirrhosis.

MATERIALS AND METHOD

A descriptive study was conducted at the University of Lahore Teaching Hospital Lahore after Ethical Review Board approval at university of Lahore faculty of Allied Health sciences, Lahore. On the basis of diagnosis inclusion criteria were included adult patients of both genders for abdominal ultrasound. And patients who are willing to participate. In exclusion Criteria excluded the Patient present with any known pathologies. Collection of data was done by the help of convenient technique of sampling according to gender, age as well as sonographic findings of patients with acute viral hepatitis B & C. Total sample size was 162. Later than compilation, data were run in MS Excel Sheet as well as analyzed by SPSS version 21.

RESULTS

Out of total number of 162 patients, 129(79%) were males and 33(20%) were females, 94(58%) patients had fever and 68(42%) had no fever. Out of total number of 162 patients, 57(35%) patients had positive Hepatitis B, 105(64%) had negative, 73(45%) patients had positive Hepatitis C, 89(54%) had negative, 67(41%) patients alter liver parenchymal echotexture, 68(42%) had coarse liver echotexture and 27 (16%) had normal homogenous echotexture. 63(38%) patients had irregular margins of liver and 99(61%) had regular margins of liver. 63(39%) had chronic liver disease, 25(15%) had hepatomegaly and 74(45%) had normal size.

Table 1: Frequency of gender:

Gender	Frequency	%age
Female	33	20.4
Male	129	79.6
Total	162	100

Out of total number of 162 patients, 129 were males and 33 were females.

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Table 2: Frequency of descriptive statistics:

Descriptive Statistics						
Age	N	Range	Min.	Max.	Mean	Std. Deviation
	162	80.00	5.00	85.00	46.7469	16.46729
Valid N (listwise)	162					

Descriptive statistics shows that minimum age group were 5 years and maximum age group was 85 years.

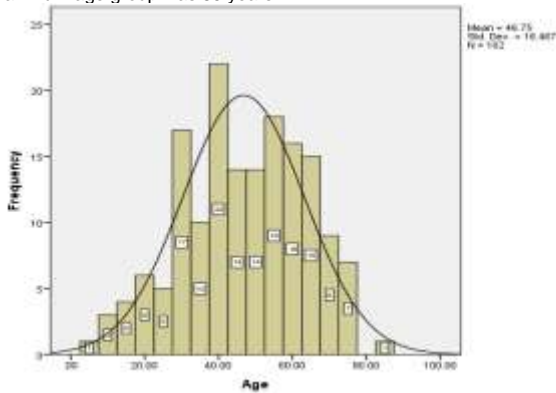


Table 3: Crosstabulation between hepatitis B and Fever:

Fever	Hepatitis B		Total
	Negative	Positive	
No	Count: 43	Count: 25	Count: 68
	% within Fever: 63.2%	% within Fever: 36.8%	100.0%
Yes	Count: 62	Count: 32	Count: 94
	% within Fever: 66.0%	% within Fever: 34.0%	100.0%
Total	Count: 105	Count: 57	Count: 162
	% within Fever: 64.8%	% within Fever: 35.2%	100.0%

Cross tabulation shows that out of total number of 162 patients, 43 patients had no fever and negative hepatitis B, but 25 had positive but no fever. 62 had fever but negative hepatitis B, 32 had fever and positive hepatitis B.

Table 4: Crosstabulation between hepatitis C and Fever

Fever	Hepatitis C		Total
	Negative	Positive	
No	Count: 36	Count: 32	Count: 68
	% within Fever: 52.9%	% within Fever: 47.1%	100.0%
Yes	Count: 53	Count: 41	Count: 94
	% within Fever: 56.4%	% within Fever: 43.6%	100.0%
Total	Count: 89	Count: 73	Count: 162
	% within Fever: 54.9%	% within Fever: 45.1%	100.0%

Cross tabulation shows that out of total number of 162 patients, 36 patients had no fever and negative hepatitis C, but 32 had positive but no fever. 53 had fever but negative hepatitis C, 41 had fever and positive hepatitis C.

Table 5 Crosstabulation between hepatitis B and yellowness of skin

Yellowness of Skin	Hepatitis B		Total
	Negative	Positive	
No	Count: 43	Count: 25	Count: 68
	% within Yellowness of Skin: 63.2%	% within Yellowness of Skin: 36.8%	100.0%
Yes	Count: 62	Count: 32	Count: 94
	% within Yellowness of Skin: 66.0%	% within Yellowness of Skin: 34.0%	100.0%
Total	Count: 105	Count: 57	Count: 162
	% within Yellowness of Skin: 64.8%	% within Yellowness of Skin: 35.2%	100.0%

Cross tabulation shows that 25 patients had positive and but did not yellowness of skin, 32 had positive hepatitis B and yellowness of skin.

Table 5: Crosstabulation between hepatitis C and yellowness of skin:

Yellowness of Skin	Hepatitis C		Total
	Negative	Positive	
No	Count: 36	Count: 32	Count: 68
	% within Yellowness of Skin: 52.9%	% within Yellowness of Skin: 47.1%	100.0%
Yes	Count: 53	Count: 41	Count: 94
	% within Yellowness of Skin: 56.4%	% within Yellowness of Skin: 43.6%	100.0%
Total	Count: 89	Count: 73	Count: 162
	% within Yellowness of Skin: 54.9%	% within Yellowness of Skin: 45.1%	100.0%

Cross tabulation shows that 32 patients had positive hepatitis C and but did not yellowness of skin, 41 had positive hepatitis C and yellowish of skin

Table 6: Crosstabulation between hepatitis B and Liver Size:

Liver Size	Hepatitis B		Total
	Negative	Positive	
Enlarged	Count: 19	Count: 9	Count: 28
	% within Liver Size: 67.9%	% within Liver Size: 32.1%	100.0%
Normal	Count: 54	Count: 16	Count: 70
	% within Liver Size: 77.1%	% within Liver Size: 22.9%	100.0%
Shrunked	Count: 32	Count: 32	Count: 64
	% within Liver Size: 50.0%	% within Liver Size: 50.0%	100.0%
Total	Count: 105	Count: 57	Count: 162
	% within Liver Size: 64.8%	% within Liver Size: 35.2%	100.0%

Cross tabulation shows that out of total number of 162 patients, 32 had patients had positive Hepatitis B and shrunken liver.

Table 7: Crosstabulation between hepatitis B and Liver Size:

Liver Size	Hepatitis C		Total
	Negative	Positive	
Enlarged	Count: 16	Count: 12	Count: 28
	% within Liver Size: 57.1%	% within Liver Size: 42.9%	100.0%
Normal	Count: 40	Count: 30	Count: 70
	% within Liver Size: 57.1%	% within Liver Size: 42.9%	100.0%
Shrunked	Count: 33	Count: 31	Count: 64
	% within Liver Size: 51.6%	% within Liver Size: 48.4%	100.0%
Total	Count: 89	Count: 73	Count: 162
	% within Liver Size: 54.9%	% within Liver Size: 45.1%	100.0%

Cross tabulation shows that out of total number of 162 patients, 31 had patients had positive Hepatitis C and shrunken liver.

Table 8: Crosstabulation between hepatitis B and gender

Gender	Hepatitis B		Total
	Negative	Positive	
Female	Count: 21	Count: 12	Count: 33
	% within Gender: 63.6%	% within Gender: 36.4%	100.0%
Male	Count: 84	Count: 45	Count: 129
	% within Gender: 65.1%	% within Gender: 34.9%	100.0%
Total	Count: 105	Count: 57	Count: 162
	% within Gender: 64.8%	% within Gender: 35.2%	100.0%

Cross tabulation shows that 12 females had positive and 45 males had positive hepatitis B.

Table 9: Crosstabulation between hepatitis C and gender:

Gender	Hepatitis C		Total
	Negative	Positive	
Female	Count: 17	Count: 16	Count: 33
	% within Gender: 51.5%	% within Gender: 48.5%	100.0%
Male	Count: 72	Count: 57	Count: 129
	% within Gender: 55.8%	% within Gender: 44.2%	100.0%
Total	Count: 89	Count: 73	Count: 162
	% within Gender: 54.9%	% within Gender: 45.1%	100.0%

Cross tabulations show that 16 females had positive and 57 males had positive hepatitis C

Table 10: Crosstabulation between hepatitis B and liver margins:

Liver Margin	Hepatitis B		Total
	Negative	Positive	
Irregular	Count: 32	Count: 31	Count: 63
	% within Liver Margin: 50.8%	% within Liver Margin: 49.2%	100.0%
Regular	Count: 73	Count: 26	Count: 99
	% within Liver Margin: 73.7%	% within Liver Margin: 26.3%	100.0%
Total	Count: 105	Count: 57	Count: 162
	% within Liver Margin: 64.8%	% within Liver Margin: 35.2%	100.0%

Cross tabulation shows that 31 patients had positive hepatitis B and irregular margin, and 26 had positive hepatitis B and regular margins.

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.887 ^a	1	.003		
Continuity Correction	7.909	1	.005		
Likelihood Ratio	8.815	1	.003		
Fisher's Exact Test				.004	.003
N of Valid Cases	162				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 22.17.

b. Computed only for a 2x2 table

Table 11: Crosstabulation between hepatitis C and liver margins

Liver margin		Hepatitis C		Total
		Negative	Positive	
Irregular	Count	32	31	63
	% within Liver Margin	50.8%	49.2%	100.0%
Regular	Count	57	42	99
	% within Liver Margin	57.6%	42.4%	100.0%
Total	Count	89	73	162
	% within Liver Margin	54.9%	45.1%	100.0%

Tabulation shows that 31 patients had positive hepatitis C and irregular margin, and 42 had positive hepatitis C and regular margins.

Table 12: Crosstabulation between hepatitis B and Liver echotexture:

Liver Echotexture		Hepatitis B		Total
		Negative	Positive	
Alter	Count	48	19	67
	% within Liver Echotexture	71.6%	28.4%	100%
Coarse	Count	34	34	68
	% within Liver Echotexture	50.0%	50.0%	100%
Homo-geneous	Count	23	4	27
	% within Liver Echotexture	85.2%	14.8%	100%
Total	Count	105	57	162
	% within Liver Echotexture	64.8%	35.2%	100.0%

Cross tabulation shows that 34 patients had coarse liver echotexture and had positive hepatitis B.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.826 ^a	2	.002
Likelihood Ratio	13.317	2	.001
N of Valid Cases	162		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.50.

Fig 1: Liver is normal in size measuring 14.6 cm and shows coarse heterogenous echotexture with irregular margins, sonographic features are suggestive of possibility of hepatitis C.



Table 13: Crosstabulation between hepatitis C and Liver echotexture:

Liver Echotexture		Hepatitis C		Total
		Negative	Positive	
Alter	Count	43	24	67
	% within Liver Echotexture	64.2%	35.8%	100%
Coarse	Count	35	33	68
	% within Liver Echotexture	51.5%	48.5%	100%
Homo-geneous	Count	11	16	27
	% within Liver Echotexture	40.7%	59.3%	100%
Total	Count	89	73	162
	% within Liver Echotexture	54.9%	45.1%	100.0%

Cross tabulations shows that 33 had coarse liver echotexture and had positive hepatitis C.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.840 ^a	2	.089
Likelihood Ratio	4.870	2	.088
N of Valid Cases	162		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.17.

DISCUSSION

Pre-marital Disease viewing is of substantial importance like prohibits next generation illness as well as be able to too give an imminent in to happening of certain diseases. Mandatory pre-marital Screening plan into Pakistan people gives brilliant plat-form for estimating diverse illness occurrence within common people⁸. Among elevated hepatitis occurrence and it became highly important for obtaining datum on disease prevalence⁹.

In our study, we designed sonographic findings in patients of hepatitis B and C. On analytic presentation base to exclude hepatitis B as well as C ultrasound is considered as reliable method for diagnosis of sonographic findings among hepatitis B and C indications. In current study, attempt was made to determine sonographic findings in patients of hepatitis B and C. Collection of data was done by the help of convenient technique of sampling according to gender, age, clinical history and sonographic findings of liver. Total number of 162 patients (79% of men and 20% of women) was collected. They were clinically suspected cases of findings of hepatitis B and C. In accordance with consequences, out of 162 patients, 57% had positive Hepatitis B and 73% had positive hepatitis C.

Another study in 2009 revealed that A study conducted in 2009 showed that HBV occurrence in pair experienced throughout pre-marital Screening Program was 1.31%, while it was 0.33% for HCV and HCV pervasiveness in 2008 was 0.1%, in 2009 was 3% and in 2010 was 3%¹⁰.

Another study was introduced by Shahid Sarwar, and Anwar A. Khan in 2017. In this study, 216 patients included, liver cirrhosis was available in 112(51.9%) patients, and 69(31.9%) were treatment experienced¹¹. Liver sickness was decompensated in 37(17.1%) patients. 206 patients who finished examination convention, 173(83.1%) accomplished SVR12, 89.2% (25/28) with triple treatment, and 82.2% (148/180) with so fosbuvir / ribavirin treatment. Treatment reaction was comparative between treatment innocent 86.2% (119/138) and treatment experience 79.4% (54/68) patients (p value 0.9) SVR12 was mediocre in cirrhosis patients 75.4% (80/106) when contrasted with those with no cirrhosis 93%(93/100) (p value <0.000)¹². It was considerably lesser in those with decompensated liver ailment 68.8% (24/35). In results of our study, out of total number of 162 patients, 63 had chronic liver disease, 25 had hepatomegaly and 74 had normal size¹³.

Median, mean, inter-quartile, and upper and lower limits of SWV of normal liver were 1.07m/sec, 0.97 to 1.16m/sec, as well as 0.85 to 1.26m/sec, correspondingly in this study. These values are alike to those reported by Liao et al., who got to confidence interval of 95% of median and mean SWV of normal livers measured at S 5/8 were 0.81 to 1.27 as well as 0.82 to 1.27m/sec, correspondingly.¹⁴ Though, our results are conflicting among consequence of Hu et al., that mean SWV of normal liver was 1.31± 0.25m/sec. For the moment, Median SWV among Biopsy established Cirrhosis was established elect minor than patients of decompensate Cirrhosis (1.39m/sec vs. 2.02m/sec), representative to diverse stage of cirrhosis are related among diverse stages of liver tautness. In results of our study Out of total number of 162 patients, 63 had chronic liver disease, 25 had hepatomegaly and 74 had normal size, 67 patients alter liver parenchymal echotexture, 68 had coarse liver echotexture and 27 had normal homogenous echotexture^{15,16}.

CONCLUSION

From our study, we concluded that cirrhosis of liver related with Hepatitis B and Hepatitis C virus more ordinary within man than woman. Cirrhosis of liver related with Hepatitis B and Hepatitis C virus are majorly affect the rural areas.

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REFERENCES

- Zhang HC, Zhu T, Hu RF, Wu L. Contrast-enhanced ultrasound imaging features and clinical characteristics of combined hepatocellular cholangiocarcinoma: comparison with hepatocellular carcinoma and cholangiocarcinoma. *Ultrasonography*. 2020 Oct;39(4):356.
- Du Y, Fang Z, Jiao BJ, Xi G, Zhu C, Ren Y, Guo Y, Wang Y. Application of ultrasound-based radiomics technology in fetal lung texture analysis in pregnancies complicated by gestational diabetes or pre-eclampsia. *Ultrasound in Obstetrics & Gynecology*. 2020 Apr 6.
- Wei Y, Gao F, Zheng D, Huang Z, Wang M, Hu F, Chen C, Duan T, Chen J, Cao L, Song B. Intrahepatic cholangiocarcinoma in the setting of HBV-related cirrhosis: Differentiation with hepatocellular carcinoma by using Intravoxel incoherent motion diffusion-weighted MR imaging. *Oncotarget*. 2018 Jan 30;9(8):7975.
- Wu W, Chen J, Bai C, Chi Y, Du Y, Feng S, Huo L, Jiang Y, Li J, Lou W, Luo J. The Chinese guidelines for the diagnosis and treatment of pancreatic neuroendocrine neoplasms (2020). *Journal of Pancreatology*. 2021 Mar 1;4(1):1-7.
- Malone CD, Fetzter DT, Monsky WL, Itani M, Mellnick VM, Velez PA, Middleton WD, Averkiou MA, Ramaswamy RS. Contrast-enhanced US for the interventional radiologist: Current and emerging applications. *Radiographics*. 2020 Mar;40(2):562-88.
- Leenknecht B, Moore S, Fang C, Kibriya N, Gregory S, Cancuri O, Sidhu PS, Yusuf G. Using contrast-enhanced ultrasound to guide a successful biopsy of a splenic sarcomatoid carcinoma. *Ultrasound*. 2020 Feb;28(1):58-61.
- Sparchez Z, Mocan T, Hagiuc C, Kacso G, Zaharie T, Rusu I, Al Hajjar N, Leucuta DC, Sparchez M. Real-Time Contrast-Enhanced-Guided Biopsy Compared with Conventional Ultrasound-Guided Biopsy in the Diagnosis of Hepatic Tumors on a Background of Advanced Chronic Liver Disease: A Prospective, Randomized, Clinical Trial. *Ultrasound in medicine & biology*. 2019 Nov 1;45(11):2915-24.
- Kang HJ, Kim JH, Lee SM, Yang HK, Ahn SJ, Han JK. Additional value of contrast-enhanced ultrasonography for fusion-guided, percutaneous biopsies of focal liver lesions: prospective feasibility study. *Abdominal Radiology*. 2018 Dec;43(12):3279-87.
- Nolsøe CP, Nolsøe AB, Klubien J, Pommergaard HC, Rosenberg J, Meloni MF, Lorentzen T. Use of ultrasound contrast agents in relation to percutaneous interventional procedures: a systematic review and pictorial essay. *Journal of Ultrasound in Medicine*. 2018 Jun;37(6):1305-24.
- Pang EH, Chan A, Ho SG, Harris AC. Contrast-enhanced ultrasound of the liver: optimizing technique and clinical applications. *American Journal of Roentgenology*. 2018 Feb;210(2):320-32.
- Eso Y, Takai A, Takeda H, Matsumoto T, Lee M, Inuzuka T, Takahashi K, Ueda Y, Marusawa H, Seno H. Sonazoid-enhanced ultrasonography guidance improves the quality of pathological diagnosis in the biopsy of focal hepatic lesions. *European journal of gastroenterology & hepatology*. 2016 Dec 1;28(12):1462-7.
- Gilani SA, Khan MA, Latif MZ, Malik AA, Arif M, Bukhari I. Epidemiological Study of Anti HCV Antibodies in Rural Punjab. *Annals of King Edward Medical University*. 2017;23(2).
- Asad M, Ahmed F, Zafar H, Farman S. Frequency and determinants of Hepatitis B and C virus in general population of Farash Town, Islamabad. *Pakistan journal of medical sciences*. 2015;31(6):1394.
- Papatheodoridis G, Thomas HC, Golna C, Bernardi M, Carballo M, Cornberg M, Dalekos G, Degertekin B, Dourakis S, Flisiak R, Goldberg D. Addressing barriers to the prevention, diagnosis and treatment of hepatitis B and C in the face of persisting fiscal constraints in Europe: report from a high level conference. *Journal of viral hepatitis*. 2016 1;23(S1):1-2.
- Kleiman RE, Goulet O, Mieli-Vergani G, Sanderson IR, Sherman PM, Shneider BL. Walker's pediatric gastrointestinal disease: physiology, diagnosis, management. Hamilton: BC Decker INC. 2008;2008:712-3.
- Sheen CL, Lamparelli H, Milne A, Green I, Ramage JK. Clinical features, diagnosis and outcome of acute portal vein thrombosis. *Qjm*. 2000 Aug 1;93(8):531-4.
- Xie B, Lin W, Ye J, Wang X, Zhang B, Xiong S, Li H, Tan G. DDR2 facilitates hepatocellular carcinoma invasion and metastasis via activating ERK signaling and stabilizing SNAIL1. *Journal of Experimental & Clinical Cancer Research*. 2015;34(1):101.