

Abnormal Ultrasonographic Findings in Patients with Chronic HCV: An Egyptian Experience

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Abstract

Background: Ultrasound plays a crucial role in the non-invasive evaluation of chronic HCV patients, particularly in limited resources setting where it can provide an easy-to-use and cheap imaging modality. Ultrasound can evaluate the liver size, texture, liver edge, hepatic parenchyma, presence of liver nodules, and hepatic vascularity, as well as the affection of spleen and venous supply. In most hepatic centers, ultrasound is a part of the routine evaluation of chronic HCV to evaluate the stage of disease and the severity of fibrosis. The present study assessed the frequency of abnormal ultrasonographic findings in Egyptian patients with chronic HCV infection.

Aim of Study: This study assessed the frequency of abnormal ultrasonographic findings in Egyptian patients with chronic hepatitis C virus (HCV) infection.

Patients and Methods: A cross-sectional study was conducted on HCV patients presented to the Cairo University hospitals through the period from July 2014 to July 2015. All examinations were performed by the same operator.

Results: Three hundred patients were included in the present study. The mean age of the included patients was 48.1 ± 13 years old and nearly 60% of the patients were males. Overall, the prevalence of abnormal ultrasound findings during abdominal examination was 60.7% (n=180). Besides, 20% of the patients had enlarged spleen, with an average size of 13.9 ± 3 cm.

Conclusion: In conclusion, our findings highlight the high prevalence of abnormal ultrasound findings amongst Egyptian patients with chronic HCV. We found that more than 60% of the chronic HCV patients had variable degree of abnormalities during abdominal ultrasound findings. Thus, ultrasound examination should be implemented as routine investigation during evaluation of chronic HCV patients, which can provide an easy-to-use, reliable, and cheap modality in limited settings.

Key Words: Chronic HCV – Ultrasound – Chronic liver disease – Abnormalities.

Introduction

THE endemic of the hepatitis C virus (HCV) infection is a major public health problem with devastating long-term consequences. According to recent epidemiological figures, the seroprevalence of HCV is still increasing, especially in the Eastern Mediterranean and European Regions, with an estimated global prevalence of 2.5% [1,2]. Egypt has the highest prevalence rate of HCV worldwide with approximately 2 to 6 new cases per 1000 population every year [3]. Based on viral genome sequences, there are currently seven recognized genotypes of HCV; though HCV genotype 1 and 3 are the most prevalent worldwide, genotype 4 is the most commonly identified genotype in the Middle East [1,4]. HCV infection is transmitted mainly through blood contact and to a lesser extent by sexual contact or perinatally. Despite the fact that HCV infection is largely asymptomatic in the acute stage, chronic HCV is associated with a significant risk of mortality and liver-related complications [5]. Recently, it was reported that up to 30% of patients with chronic HCV had liver cirrhosis, while the prevalence of decompensated liver failure is 11% [6]; moreover, the current body of evidence shows that chronic HCV is a major risk for the development of hepatocellular carcinoma (HCC) [7]. In addition, the mortality rates secondary to chronic HCV showed a notable increase from 2006 to 2010 [6]. Chronic HCV represents a financial burden, both in national and global levels, as well; according to previous reports, it was estimated that the treatment expenses of HCV infection were \$6.5 billion in 2011 in the United States alone [8].

Ultrasound plays a crucial role in the non-invasive evaluation of chronic HCV patients, particularly in limited resources setting where it can

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provide an easy-to-use and cheap imaging modality [9]. Ultrasound can evaluate the liver size, texture, liver edge, hepatic parenchyma, presence of liver nodules, and hepatic vascularity, as well as the affection of spleen and venous supply. In most hepatic centers, ultrasound is a part of the routine evaluation of chronic HCV to evaluate the stage of disease and the severity of fibrosis [10,11]. The present study assessed the frequency of abnormal ultrasonographic findings in Egyptian patients with chronic HCV infection.

Material and Methods

The study was initially approved by the local ethics committee of Cairo University Hospital, and run in compliance with regulatory laws and the Declaration of Helsinki [12]. The manuscript was prepared per the recommendations of the STROBE guidelines [13]. All patients signed the written informed consent before enrollment.

Study design and patients:

In this study conducted a cross-sectional study that recruited Egyptian patients with chronic HCV who were being followed at the outpatient clinics of Cairo University hospitals through the period from July 2014 to July 2015. Patients were deemed eligible if they aged >18 years old and had a laboratory-confirmed chronic HCV, regardless of the state of the cirrhosis. Patients were excluded if they had concurrent hepatitis B virus (HBV), autoimmune disease, malignancy, or cryoglobulinemia.

Data collection and ultrasound evaluation:

Patients were assessed for demographic characteristics, routine laboratory assessment, and abdominal ultrasound (US) examination. The ultrasound examination was performed using B-mode ultrasound (Philibis infinity 70) with a 7.5 MHz linear array transducer. A single ultrasound operator performed all ultrasound examinations. The primary outcome of the present study was to assess the frequency of abnormal ultrasonographic findings in Egyptian patients with chronic HCV infection.

Statistical analysis:

The statistical software MINITAB (16.0) was used for data processing and analysis. According to the normality of data distribution, the central tendency and variability of the numerical data were presented in the form of mean \pm standard deviations (SD) or median with interquartile range (IQR). Frequency counts and percentages summarized categorical variables.

Results

Three hundred patients were included in the present study. The mean age of the included patients was 48.1 ± 13 years old and nearly 60% of the patients were males. The mean and standard deviation of the laboratory and imaging findings were estimated as shown in Table (1). The mean hemoglobin level was 11.5 ± 2.1 g/dL, while the mean of white blood cells and platelet count was $5.4 \pm 2.5 \times 10^3$ and $147.5 \pm 80 \times 10^6$, respectively. The mean direct bilirubin level was 1.4 ± 1.6 mg/dL. The liver enzymes (ALT and AST) were mostly within the average range, as well as the serum albumin level. The mean alpha fetoprotein (AFP) was 8.6 ± 4.3 ng/dL.

Overall, the prevalence of abnormal ultrasound findings during abdominal examination was 60.7% (n=180), Fig. (1). Besides, 20% of the patients had enlarged spleen, with an average size of 13.9 ± 3 cm.

Table (1): Characteristics of the studied groups.

Variables	Patients (N=300)
<i>Age (years):</i>	
Mean \pm SD	48.1 \pm 13
Range	18-85
<i>Sex (n, %):</i>	
Male	182 (60.7%)
Female	118 (39.3%)
<i>Laboratory findings:</i>	
HB	11.5 \pm 2.1
WBCs	5.4 \pm 2.5
Platelets	147.5 \pm 80
Total bilirubin	2.2 \pm 2.3
Direct bilirubin	1.4 \pm 1.6
ALT	57 \pm 23
AST	60 \pm 26
Albumin	3.2 \pm 0.9
PT	15.2 \pm 4
INR	1.4 \pm 0.3
AFP	8.6 \pm 4.3

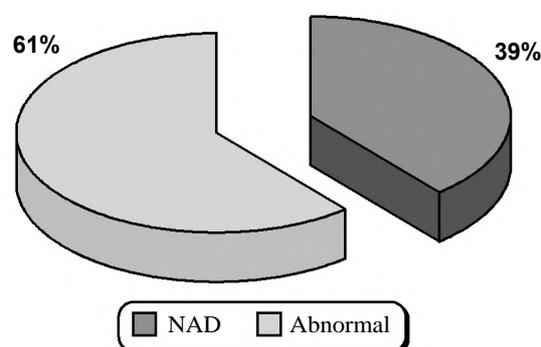


Fig. (1): Pelvi-abdominal ultrasonography findings.

Discussion

Ultrasound plays a crucial role in the non-invasive evaluation of chronic HCV patients, particularly in limited resources setting where it can provide an easy-to-use and cheap imaging modality [9]. Ultrasound can evaluate the liver size, texture, liver edge, hepatic parenchyma, presence of liver nodules, and hepatic vascularity, as well as the affection of spleen and venous supply. In most hepatic centers, ultrasound is a part of the routine evaluation of chronic HCV to evaluate the stage of disease and the severity of fibrosis [10,11]. The present study assessed the frequency of abnormal ultrasonographic findings in Egyptian patients with chronic HCV infection.

We found that the prevalence of abnormal ultrasound findings during abdominal examination was 60.7% (n=180). Besides, 20% of the patients had enlarged spleen, with an average size of 13.9 ± 3 cm. In a previous report by Måaji et al., the rate of abnormal ultrasound findings amongst patients with chronic liver disease was nearly 43%. Besides, nearly 93% of the cohort showed hepatic edge irregularities [9]. In another report, the rate of abnormal ultrasound findings was 32% [14]. In Weickert et al., study, the rate of abnormal ultrasound findings was 55% [15]. Other reports showed similar findings [16].

The current body of evidence shows that ultrasound examination can yield high sensitivity and reliability in assessing the severity of liver fibrosis. The multidimensional value of ultrasound cannot be overstated. In Choong et al., it was confirmed that routine abdominal ultrasound was sensitive and reliable for differentiating early stage of liver fibrosis, with nodularity being the most distinguished feature [17]. Other reports demonstrated that abnormal hepatic surface is a useful indicator of liver fibrosis and the need for liver biopsy [18]. Abnormalities in ultrasound was even found to have higher diagnostic yield when they combined with abnormal liver functions (albumin level < 3.5 g/dL) [19]. Martinez et al., recommended non-invasive tests can be combined with abdominal ultrasound to differentiate clinically-significant fibrosis [20].

This study has some limitations including the small sample size and the single-center setting of the study that may hinder the generalizability of our data. In addition, we could not assess the patterns of abnormalities due to the insufficiency of the data. Moreover, the implication of these abnormalities on HCV condition in form of clinical severity and response to treatment was not assessed.

In conclusion, our findings highlight the high prevalence of abnormal ultrasound findings amongst Egyptian patients with chronic HCV. We found that more than 60% of the chronic HCV patients had variable degree of abnormalities during abdominal ultrasound findings. Thus, ultrasound examination should be implemented as routine investigation during evaluation of chronic HCV patients, which can provide an easy-to-use, reliable, and cheap modality in limited settings. Further research should be performed to examine whether high frequency probe can enhance the sensitivity of ultrasound examination, and whether ultrasound examination can replace liver biopsy.

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التغيرات التي تحدث في الموجات الصوتية على البطن في مرضى التهاب الفيروسي الكبدي سي المزمن

الهدف من هذه الدراسة هو تحديد التغيرات التي تحدث في الأشعة الموجات الصوتية على البطن في مرضى التهاب الفيروسي الكبدي سي المزمن وتعتبر الموجات الصوتية من أرخص وأسرع الطرق التي تستخدم لاكتشاف التغيرات التي تطرأ في مرضى فيروس سي المزمن ومن هذه التغيرات التي تطرق على الكبد (دهون الكبد - تليف الكبد - أورام الكبد).

التغيرات التي تطرق على الطحال من تضخم وارتفاع ضغط الوريد البابي الكبدي والاستسقاء الغشاء البريتوني.

هذه دراسة مسحية مسبقة تم إجرائها من الفترة يونيو ٢٠١٤ - يونيو ٢٠١٥ في مستشفيات كلية طب القصر العيني وقد شملت ثلاثمائة مريض مصاب بالتهاب الكبد الفيروسي نوع سي جرى تعريضهم لسلسلة من الفحوصات السريرية والمناعية بالإضافة إلى التشخيص بالموجات الصوتية.

وتعتبر أيضاً الأشعة التلفزيونية من الفحوصات الدورية التي يتم عملها لمرضى التهاب الفيروسي الكبدي سي وتليف الكبد كل ٦ شهور لمتابعة ظهور أى أورام بالكبد وأى مضاعفات من التليف.

وتبين من هذه الدراسة أوضحت تغيرات في أكثر من ٦٠٪ من مرضى التهاب الفيروسي الكبدي سي لذا يعتمد عليها في التشخيص والمتابعة.