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# Impact of COVID-19 fear on Hepatitis C management

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**Ethics Committee Approval**
This study was approved by the ethics committee of Ondokuz Mayıs University Faculty of Medicine (Decision no: 2022/377 Date: 26.10.2022).
All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

**Conflict of Interest**
No conflict of interest was declared by the authors.

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## Abstract

**Background/Aim:** Hepatitis C virus (HCV) infection, a major cause of cirrhosis worldwide, is the most common cause of cirrhosis and hepatocellular carcinoma in Turkey. Today, HCV infection can be treated effectively and safely using direct-acting antiviral drugs, and therefore, the World Health Organization has announced elimination targets by 2030. During the pandemic, many social and personal restrictions were applied for fear of increasing the prevalence of coronavirus disease 2019 (COVID-19) infection. Here we investigate the effects of these restrictions on managing HCV infection in internal medicine departments that deal with both infections.

**Methods:** Patients who applied to the internal medicine departments of our hospital and tested for anti-HCV between 11 March 2020 and 09 April 2022, which was the time interval when official restrictions were applied in Turkey during the COVID-19 pandemic, were included in the study. Patients who were not tested for anti-HCV were excluded from the study. The study was planned as a retrospective cohort study, and patients' files tested for anti-HCV were scanned. Anti-HCV positivity, HCV RNA PCR testing, and treatment status in HCV RNA-positive patients were evaluated.

**Results:** During the official pandemic period when social restrictions were applied, anti-HCV positivity was revealed in 400 (1.9%) of 21,501 patients for whom anti-HCV tests were performed in internal medicine departments. HCV RNA was not tested in 64 of 400 patients with positive anti-HCV test (16%), and 83 (24.7%) of 336 patients tested for HCV RNA were found to be positive. It was determined that 17 (20.5%) of the HCV RNA-positive patients did not receive antiviral treatment.

**Conclusion:** In studies conducted in Turkey in the pre-pandemic period, it was determined that HCV RNA was not tested in approximately half of the anti-HCV-positive patients, while this rate was found to be only 16% during the pandemic period. This can be explained by the fact that patients infected with the COVID-19 virus were mostly followed-up by internal medicine clinics, where the awareness of viral hepatitis was high. It was determined that 20.5% of the patients with positive HCV RNA PCR tests remained untreated. This finding suggested that the social and personal restrictions applied during the pandemic led to patient follow-up and treatment disruptions.

**Keywords:** hepatitis C, management, pandemic

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## Introduction

Viral hepatitis due to the hepatitis C virus is accepted as a major public health problem today. The worldwide prevalence of hepatitis C (HCV) is estimated to be 1% [1,2]. The prevalence of the disease is especially high in the Eastern Mediterranean Region, Egypt, and China [1]. In the United States, HCV is recognized as the most common cause of chronic liver disease, hepatocellular carcinoma, and liver transplantation [3]. In Turkey, the prevalence of HCV is between 1% and 1.9% [4], and HCV is the most common cause of chronic liver disease and liver transplantation after the Hepatitis B virus [5,6].

A spontaneous eradication of acute HCV infection occurs in 15–45% of patients within 6 months, while 50–85% become chronic [2,7,8]. In 20–30% of chronic cases, chronic liver disease and cirrhosis develop over time [9–11]. HCV infection may also cause many immune-related extrahepatic clinical manifestations, such as cryoglobulinemic vasculitis, polyarthritis, monoarthritis, peripheral neuropathy, immune thrombocytopenic purpura, Sjogren's syndrome, and membranoproliferative glomerulonephritis [12].

Significant progress has been made in treating HCV using direct-acting antivirals (DAA), which provide virus elimination and cure with fewer side effects and better toleration [13,14]. DAA drugs significantly reduce HCV-related mortality and the need for liver transplantation, but it is estimated that only 20% of individuals with HCV infection know their diagnosis, and only 15% of those with known HCV infection have been treated [15].

The World Health Organization (WHO) aims to reduce new chronic HCV infections by 90% and mortality by 65% by 2030 through newly developed effective treatments [16]. One of the most important obstacles to reaching this goal is the low awareness of both patients and healthcare providers about chronic hepatitis C in Turkey and worldwide. During the pandemic, various restrictions – such as the obligation to wear a mask, curfew, intercity travel ban, and online education – were implemented by the national health authorities due to the concern about the increase in the prevalence of the coronavirus disease 2019 (COVID-19) infection. In addition, patients and healthcare professionals applied some personal restrictions in addition to these due to the fear of contamination. Restrictions and changes in the delivery of health services during this period shifted clinicians' attention to COVID-19 and related conditions. In the pre-pandemic period, internal medicine departments were clinics where the diagnosis and treatment of patients with HCV infection were made frequently, and they also played an important role in the diagnosis and treatment of COVID-19 patients during the pandemic period when restrictions were applied.

Here we examine the effects of the restrictions during the pandemic on the diagnosis, follow-up, and treatment of HCV in patients who applied to the internal medicine departments of our hospital.

## Materials and methods

During the COVID-19 pandemic in Turkey, official restrictions were implemented between 11 March 2020 and 09 April 2022. During this period, the files of the patients who applied to the internal medicine departments of our hospital were retrospectively reviewed. Patients tested for anti-HCV were included in the study, and those without anti-HCV testing were excluded. Then, the files of the patients included in the study were scanned retrospectively. The clinics visited by anti-HCV-positive patients and HCV RNA PCR testing status were recorded. The patients with HCV RNA positivity who received antiviral treatment and who remained untreated were investigated in the e-pulse system of the Ministry of Health (a database integrated into the social health system). Anti-HCV-positive patients who died without receiving treatment were retrieved from the death notification system (a database integrated into the social health system). Patients who were alive and needed treatment were reached using the phone numbers registered in the hospital database. After obtaining verbal consent from the patients, they were asked whether they had knowledge about the diagnosis of HCV infection. After informing the untreated patients about the diagnosis and treatment, it was explained that they could apply to the appropriate centers if they were interested.

**Approval of the ethics committee**

The study protocol was permitted by the ethics committee of Ondokuz Mayıs University Faculty of Medicine (decision no:2022/377, date:26.10.2022), and the procedures were in accordance with the Helsinki Declaration.

**Statistical analysis**

Statistical analysis was performed using the Windows SPSS program (version 22.0, SPSS Inc., Chicago, IL). In our study, the Kolmogorov-Smirnov test was applied for age, which was the only numerical data, and it was expressed as mean (SD) since it showed a normal distribution. Categorical data were expressed as n (%).

## Results

We reviewed 21,501 anti-HCV tests performed in the department of internal medicine, Ondokuz Mayıs University Faculty of Medicine, between 2020 and 2022 during the COVID-19 pandemic. Anti-HCV positivity was revealed in 400 of these patients. Of the patients, 220 (55%) were female, and 180 (45%) were male. The mean age was 64.3 (14.0) years. HCV RNA was not tested in 64 of 400 cases with positive anti-HCV test (16%). Of 336 patients tested for HCV RNA, 83 (24.7%) were positive, and 253 (63%) were negative. Of the patients with HCV RNA positivity, 27 (32.5%) died without receiving treatment, 38 (45.8%) were able to receive antiviral treatment, 17 (20.5%) could not receive any treatment, and 1 (1.2%) became negative spontaneously without treatment. This patient was evaluated as having acute hepatitis C (Figure 1).

When the distribution of anti-HCV-positive patients was considered by clinical departments of internal medicine, as can be expected, most cases (227 patients) were detected in the Gastroenterology clinic. The lowest percentage of patients who did not have HCV RNA testing (10%) were also in Gastroenterology. The distribution of anti-HCV-positive patients by departments of internal medicine is shown in Table 1.

Figure 1: Distribution of anti-HCV positive patients, HCV RNA results, and antiviral treatment status.

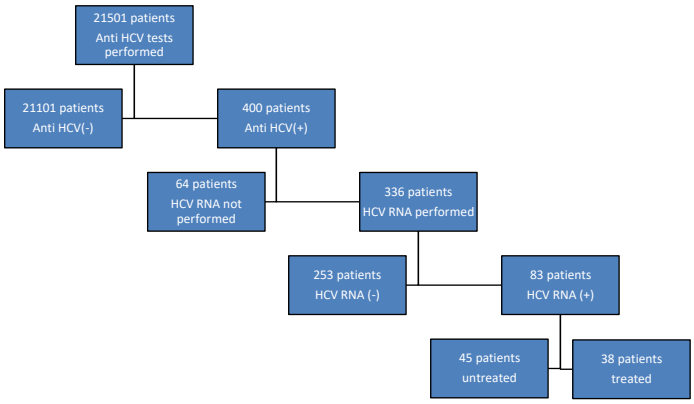


Table 1: Distribution of anti-HCV positive patients by departments of internal medicine

| | HCV RNA (-) n=253 | HCV RNA (+) n=83 | HCV RNA (?) n=64 | Total n=400 |
|---|---|---|---|---|
| **Gastroenterology** | 145 (63.9%) | 58 (25.6%) | 24 (10.6%) | 227 (100%) |
| **Nephrology** | 31 (60.8%) | 8 (15.7%) | 12 (23.5%) | 51 (100%) |
| **Hematology** | 30 (56.6%) | 10 (18.9%) | 13 (24.5%) | 53 (100%) |
| **Oncology** | 33 (73.3%) | 5 (11.1%) | 7 (15.6%) | 45 (100%) |
| **Rheumatology** | 10 (55.6%) | 2 (11.1%) | 6 (33.3%) | 18 (100%) |
| **Endocrinology** | 4 (66.7%) | 0 (0%) | 2 (33.3%) | 6 (100%) |

## Discussion

HCV is a viral infection that causes chronic infection in 70 million people worldwide and is one of the most common causes of chronic liver disease, cirrhosis, and hepatocellular carcinoma in Turkey [4]. Recently used combinations of direct-acting antiviral agents lead to the eradication of HCV in 99% of cases [17]. Considering the role of HCV in chronic liver disease and clinical manifestations associated with extrahepatic immunity, no patient should be denied the chance to access treatment for this highly curable disease in today's conditions. A study investigating HCV awareness in the community found that only 49% of 393 patients infected with HCV knew the diagnosis, and only 80% consulted a doctor for anti-HCV positivity [18].

In the studies conducted in two different tertiary centers in Turkey before the COVID-19 pandemic, patients with positive anti-HCV test results were retrospectively evaluated, and the reported rates of HCV RNA PCR testing were 52.5% and 53.1% [19,20]. In our study, this rate was determined as 84% in internal medicine departments during COVID-19. Different inclusion criteria can explain this in other studies. The study was conducted in internal medicine departments with relatively higher awareness of HCV than other clinics and increased awareness due to the viral pandemic. Even in the gastroenterology department, which primarily deals with HCV infection, the presence of patients with anti-HCV positivity but no HCV RNA testing indicated that the awareness of HCV infection decreased during the pandemic period. It is known that people socially avoided entering communities during the COVID-19 pandemic, and restrictions increased this behavior. In a study conducted in China, it was demonstrated that most of the people in the Hubei region preferred e-health services to avoid social environments and comply with restriction rules during the pandemic period, and 79% of those who participated in the study applied to these services to minimize the risk of contact with COVID-19 [21].

Although the pre-pandemic HCV infection data from Turkish tertiary centers was similar to our hospital, an important limitation is that these tertiary center reports did not include our hospital's data and only included those patients who applied to internal medicine clinics. However, we believe our study holds value in light of the finding that roughly 20% of patients with HCV RNA positivity were unable to begin treatment, even at our tertiary gastroenterology clinic, during the COVID-19 pandemic.

### Conclusion

Based on our findings, Turkey fell behind national and global targets in terms of HCV diagnosis, follow-up, and treatment during the COVID-19 pandemic. This was likely because of patients' reluctance to come to the hospital during the pandemic, difficulties in reaching the doctor, travel restrictions, increased workload of doctors, changes in working patterns, and difficulty in accessing treatment. It may still be possible to achieve national and global targets for treating HCV infection with retrospective HCV case screenings for the pandemic and identifying and treating cases needing treatment.

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