

Case Report**COVID-19 and Hepatitis a Coinfection: A Case Report****Ali Mehri^{1, †}, Sepideh Hasanzadeh^{2, 3, †}, Kiarash Ghazvini^{2, 4}, Mahnaz Mozdorian^{5, *}**¹Endoscopic and Minimally Invasive Surgery Research Centre, Mashhad University of Medical Sciences, Mashhad, Iran²Antimicrobial Resistance Research Centre, Mashhad University of Medical Sciences, Mashhad, Iran³Department of Medical Laboratory Sciences, Varastegan Institute for Medical Sciences, Mashhad, Iran⁴Department of Microbiology and Virology, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran⁵Lung Diseases Research Centre, Mashhad University of Medical Science, Mashhad, Iran**Email address:**

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Abstract: Elevated levels of liver enzymes have been identified as a common manifestation of coronavirus infection. However, it is essential to recognize that abnormal liver enzyme elevations in COVID-19 patients can also be attributed to acute hepatitis. This case report presents a clinical scenario involving a 61-year-old female patient who exhibited typical symptoms of COVID-19, including fever, nausea, anorexia, and abdominal pain. Initially, the suspicion was solely focused on COVID-19 infection. Nevertheless, subsequent investigation utilizing the acute hepatitis panel examination unveiled positive reactivity to HAV IgM, indicating a concomitant Hepatitis A virus coinfection. Throughout the course of hospitalization, the patient's clinical condition exhibited gradual improvement, leading to her discharge with an oxygen saturation level (Spo2%) exceeding 90%. Follow-up examinations conducted in the outpatient setting demonstrated the restoration of normal liver enzyme levels. This case serves as an exemplification of hepatitis coinfections, underscoring the diagnostic challenges associated with distinguishing between these two infectious conditions. It highlights the paramount importance of accurate diagnosis, preventive strategies, and optimal management approaches to effectively address such complex comorbidities. By recognizing the significance of precise diagnosis, comprehensive prevention, and appropriate management, healthcare professionals can navigate COVID-19 and hepatitis coinfections more effectively. This case report serves as a valuable reminder of the multifaceted nature of viral infections and underscores the need for a holistic approach to patient care when encountering overlapping symptomatology.

Keywords: Co-infection, Coronavirus, COVID-19, Hepatitis, Liver

1. Introduction

Since December 2019, severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), first reported in Wuhan, China, as it has spread rapidly around the world, it has created new threats and challenges to health. As of March 11, 2020, Coronavirus 2019 (COVID-19) was declared a global epidemic by the WHO. As of 16 July 2022, there have been more than 256M confirmed cases and 6.36M deaths of COVID-19 worldwide. In Iran, 7.24M people are infected with COVID-19, and 141K have died at the time this article has been written. The most clinical

manifestation include fever, dry cough, dyspnea, muscle pain, and fatigue [1, 2].

Several studies have provided evidence that COVID-19 is associated with gastrointestinal complications, acute cardiac injury, and acute renal damage [3].

The presence of abnormal liver enzymes in COVID-19 infection has not yet been established. The most results have revealed that more than 20-30% of patients with COVID-19 have an abnormal level of liver enzymes [4]. Here, we present the case of a 60-year-old woman with acute hepatitis A and COVID-19 infection concurrently.

2. Case Presentation

A 61-year-old woman with a history of hypertension and took one pill of amlodipine 5mg twice a day. She had fever, malaise, progressive nausea/vomiting, anorexia, abdominal pain, one week before admission and confusion one night before coming to the emergency room (ER). She denied taking any herbal or over-the-counter (OTC) medicine.

In the initial examination, oxygen saturation 88% without O2 therapy, respiratory rate: 120 breaths/ min, temperature: 38°C, pulse rate: 120 bpm, and blood pressure: 130/80 mm Hg.

On further examination, she was confused during the examination, but she opened her eyes by calling and was also responsive. In heart, lungs, and abdomen examinations, she was tachycardic and had coarse crackles in bases, mild tenderness in the right upper quadrant (RUQ) respectively. The rest of the examination was normal. There was no spider angioma, ascites, or other signs of chronic liver diseases. She was admitted with an initial diagnosis of COVID-19 infection. On the first day of hospitalization, a Blood investigation was done and shown in table 1.

Table 1. The primary blood examination.

VBG	PH: 7.45	CBC	WBC:10000	BS: 116	INR:1.2
	PCO2: 50		HB:12.6	Cr: 0.9	PT:14
	HCO3: 35		PLT:201000	UREA: 47	PTT:28
			PMN:89%, LYMPH: 7%	CRP: 113	
		Bilirubin	Total:1.2	Na:135	
			Direct:0.5	K:4.8	

According to high CRP level, lymphopenia and pulmonary symptoms, PCR test for COVID-19 was done, the result was positive and she was transferred to the COVID-19 wards. Lung HRCT was done to assess the grade of lung involvement.

The second blood investigation showed high levels of liver enzymes as AST: 1080, ALT: 1160, ALP: 320. Due to increased levels of liver enzymes to more than 1000, which is less reported in the course of COVID-19 infections, other causes of a severe increase in liver enzymes were investigated. Due to the severe pain of the patient in RUQ abdominal sonography was done, liver and bile ducts were normal.

She was admitted with an initial diagnosis of COVID-19 infection. The serum level of acetaminophen was undetectable and the urine toxicology screen was negative. Acute hepatitis panel examination was performed and the test results are HBS Ag: Negative, HBc Ab: Negative, HCV Ab: Negative and HAV Ab: IgM Positive.

According to the test results, the patient was diagnosed as co-infection of acute hepatitis A infection and COVID-19. During hospitalization she received isotonic IV fluid, a single dose of Ondansetron (4mg IV slowly) due to nausea, Dexamethasone 8 mg every 12 hours, Heparin 5000 units every 8 hours. Due to the increased liver enzymes, Remdesivir was not started for the patient. During the hospitalization, the patient's general condition gradually improved and the fever stopped. The oxygen level reached above 90% and the CRP level decreased. Liver enzymes also decreased as AST: 490, ALT: 600, ALP: 290. She was discharged with the explanation of danger signs. After 4 days, she returned to the clinic with lab results as AST: 14, ALT: 21, ALP: 217, the rest of the tests were normal.



Figure 1. Diffuse ground glass opacification with consolidative abnormalities.

3. Discussion

The manifestations of COVID-19 infection present in various ways, causing extensive harm. While COVID-19 is widely recognized for its impact on the respiratory system, it can also give rise to several non-respiratory manifestations [5]. These encompass complications related to blood clotting, dysfunction and irregularities in the heart, occurrences of acute coronary syndromes, damage to the kidneys, symptoms affecting the gastrointestinal tract, liver cell impairments,

elevated blood sugar levels and ketosis, diseases affecting the nervous system, ocular symptoms, and complications involving the skin [6].

Another commonly observed symptom of COVID-19 infection involves the presence of abnormal liver enzyme levels. This particular symptom has been noted in over 76% of individuals affected by COVID-19 [7]. In most reported cases, the elevation in liver enzymes was mild, with an increase of less than twice the upper limit of normal (ULN). Only a small percentage, approximately 6%, experienced more severe changes in liver enzymes, exceeding five times the ULN [6]. While this symptom is predominantly seen in hospitalized COVID-19 patients, there have been rare instances where abnormalities in liver enzymes have been reported in individuals infected with COVID-19, even in the absence of respiratory symptoms [8].

Hepatitis A virus (HAV) is an RNA virus that is primarily transmitted through the oral-fecal route, resulting in symptoms such as fatigue, weakness, lethargy, fever, and jaundice [9]. In cases of hepatitis A, the levels of ALT and AST enzymes in the liver can rise above 1000 U/dL; however, the total bilirubin levels typically remain below 10 mg/dL [9]. The diagnosis of acute hepatitis A infection is made by detecting the presence of anti-HAV IgM in the serum. Currently, there is no specific treatment available for hepatitis A infection, and individuals experiencing symptoms should receive supportive care [9, 10].

Within this article, we present a case study of a patient who experienced simultaneous infection with two viruses. The patient contracted both COVID-19 and HAV infections concurrently, leading to a worsening of liver function and the development of severe acute hepatitis. However, with the aid of supportive treatment, all liver function and coagulation markers returned to normal levels within a few months after the initial onset of symptoms. Several occurrences of coinfection associated with COVID-19 have been documented, incorporating not solely other hepatitis viruses like HBV and HCV but also supplementary viral pathogens such as EBV, HIV, and dengue fever [11-15].

Therefore, it is crucial for physicians to carefully evaluate and consider all potential causes of acute hepatitis when encountering a patient with COVID-19 infection and abnormal liver enzymes. It is important not to attribute all liver enzyme changes solely to COVID-19. Timely and accurate diagnosis plays a significant role in the management of patients and the underlying condition, highlighting the importance of thorough assessment and appropriate medical intervention.

4. Conclusion

Elevated liver function tests (LFTs) frequently occur in individuals with COVID-19 pneumonia. It is important to investigate worsening increases in transaminase levels, considering alternative viral causes like hepatitis A virus (HAV) due to potential coinfection. Our case study suggests

that HAV should be taken into consideration as a potential diagnosis in patients experiencing deteriorating LFTs.

Ethical Statement

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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