Acute hepatitis, an atypical manifestation of the novel virus, COVID-19

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Background

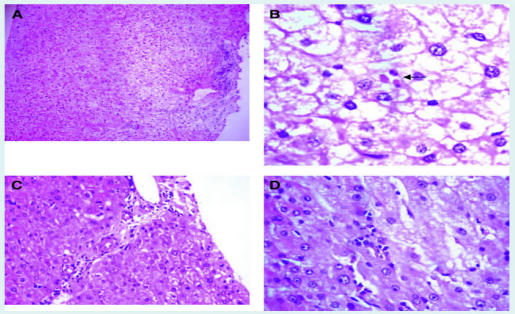
The novel SARS-CoV-2 virus (severe acute respiratory syndrome) is a highly contagious pathogen which primarily manifests as a respiratory infection with symptoms ranging from mild upper respiratory complaints to severe acute respiratory distress syndrome. However, with ongoing research and increasing cases, it has been demonstrated that COVID-19 can affect several other organ systems, including the liver. Approximately 44% of patient's affected with COVID-19 may have liver function test (LFT) abnormalities. Nonetheless, the exact mechanism of how this virus impacts the liver remains unknown. Current scientific literature suggests that liver-directed treatment is unnecessary, unless fulminant hepatic failure is present.

Case Description

A 25-year-old female presented to the hospital with complaints of abdominal pain, nausea, vomiting and diarrhea. She tested positive for COVID-19 nine days prior, which is when her GI symptoms began. She had minor respiratory complaints which resolved prior to presentation. Of note, she did not complete any treatment for COVID. Additionally, she denied any new medications, drinking alcohol, or taking supplements. Laboratory studies were notable for transaminitis with alanine aminotransferase (ALT) of 420, aspartate transaminase (AST) of 276, and normal bilirubin. Hepatology recommended autoimmune panel, viral hepatitis panel, and liver ultrasound with doppler to rule out thrombus, all of which was negative. Due to persistent GI complaints and increasing transaminitis with peak ALT of 1069 and AST of 527, a liver biopsy was performed. Biopsy revealed mild acute hepatitis, mild macrovesicular steatosis, and mild zone 3 sinusoidal dilatation, which could be related to COVID. She was discharged with close Hepatology follow up.

Results

Although elevated liver function tests may commonly be seen in hospitalized patients with COVID-19, it cannot be assumed these findings are a direct manifestation of COVID-19. In this patient case, autoimmune laboratory studies including ANA, SMA, and mitochondrial antibodies were negative. A viral pathogen panel including Hepatitis A, B, C, and E were negative, along with Epstein-Barr virus, herpes simplex virus and cytomegalovirus serologies. A toxicology evaluation demonstrated undetectable Tylenol levels, negative urine drug screen, and negative ethyl glucuronide. An ultrasound of the liver showed normal hepatic parenchyma, no bile duct dilation, and patent portal and hepatic veins. Although it would be highly unlikely in her age group, hemochromatosis and alpha-1 antitrypsin deficiency was ruled out. Ultimately, a thorough liver evaluation was performed, with no other etiology identified for her transaminitis and abdominal pain aside from her active COVID infection. Therefore, a liver biopsy was performed with findings consistent of acute COVID hepatitis.



Histology examples of SARS-associated hepatitis
Image source: https://aasldpubs.onlinelibrary.wiley.com/doi/10.1002/hep.20111
(Image used for educational purposes.)

Discussion

According to current research, liver biopsy findings consistent with hepatocellular injury secondary to COVID-19 frequently include findings of macrovesicular steatosis, mild acute hepatitis, and mild portal inflammation with lymphocytic infiltration (demonstrated on image below.) Based on common histologic findings, LFT abnormalities and liver injury is likely induced by viral-mediated cytopathic effects. In this case, a multifactorial approach included input from Internal Medicine, Infectious Disease, and Hepatology. Given that the patient had successfully created antibodies against COVID-19, convalescent plasma was deemed inapplicable. Instead, her symptoms were managed with supportive treatment including intravenous hydration and anti-emetics. At the time of outpatient evaluation, her liver function tests had improved gradually within 2 months of discharge. She experienced a full recovery, with complete resolution of her gastrointestinal manifestations.

References

1. Bertolini, A., van de Peppel, I. P., Bodewes, F. A. J. A., Moshage, H., Fantin, A., Farinati, F., ... & Peserico, G. (2020). Abnormal Liver Function Tests in Patients With COVID-19: Relevance and Potential Pathogenesis. Hepatology, 72(5), 1864-1872.
2. Gavriatopoulou, M., Korompoki, E., Fotiou, D., Ntanasis-Stathopoulos, I., Psaltopoulou, T., Kastritis, E., ... & Dimopoulos, M. A. (2020). Organ-specific manifestations of COVID-19 infection. Clinical and experimental medicine, 1-14.
3. Lagana, S. M., Kudose, S., Iuga, A. C., Lee, M. J., Fazlollahi, L., Remotti, H. E., ... & Verna, E. C. (2020). Hepatic pathology in patients dying of COVID-19: a series of 40 cases including clinical, histologic, and virologic data. Modern Pathology, 33(11), 2147-2155.