Vol. 9 | 20
Nº 2 | 22 | International Journal of
Medical and Surgical Sciences

UNIVERSIDAD AUTONOMA DE CHILE
MÁS UNIVERSIDAD

Case Report

Acute Hepatitis in a Pediatric Patient with COVID -19

Hepatitis Aguda en un paciente pediátrico con COVID-19

Manuel Enrique de la O-Cavazos
Universidad Autónoma de Nuevo León, Hospital Universitario "Dr. José Eleuterio González", Department of Pediatrics, Monterrey, Nuevo Leon, Mexico.

Manuel Enrique de la O-Escamilla
Universidad Autónoma de Nuevo León, Hospital Universitario "Dr. José Eleuterio González", Department of Pediatrics, Monterrey, Nuevo Leon, Mexico.

Alberto Gómez-Orozco
Universidad Autónoma de Nuevo León, Hospital Universitario "Dr. José Eleuterio González", Department of Pediatrics, Monterrey, Nuevo Leon, Mexico.

Luis Adrían Álvarez-Lozada
Universidad Autónoma de Nuevo León, Hospital Universitario "Dr. José Eleuterio González", Department of Pediatrics, Monterrey, Nuevo Leon, Mexico.

Marco Antonio Flores Heredia
Universidad Autónoma de Nuevo León, Hospital Universitario "Dr. José Eleuterio González", Department of Pediatrics, Monterrey, Nuevo Leon, Mexico.

Corresponding author: *Manuel Enrique de la O Cavazos*
Address: Francisco I. Madero Pte. s/n y Av. Gonzalitos, 4to. Piso, Col. Mitras Centro, C.P. 64460 Monterrey N.L. México.
E-mail: manueldelao_94@hotmail.com

Receipt: 2022-05-06
Acceptance: 2022-05-30

ABSTRACT
COVID-19 typically courses with mild clinical manifestations; however, a pediatric patient might get severe sequelae and complications when there is an infection. There is no information about liver complications due to COVID-19 in children in Mexico. This case report will set a precedent about timely diagnosis for hepatitis as a complication for COVID-19 disease in young patients in Mexico. **Clinical case:** A 12-years-old man has intermittent generalized abdominal pain misdiagnosed and treated for irritable bowel syndrome 3 days prior. The abdominal pain stayed, and a day after the patient vomited 3 times (each one after every meal). The patient

started with orangish urine, weakness, fatigue and hyporexia 1 day prior to admission. The day of the admittance, a COVID-19 RT-PCR test was performed, giving a positive result. Once he was admitted, laboratory tests were made, showing an increase of liver enzyme levels, showing liver disease as a complication for the viral infection. **Conclusion:** Pediatrics patients might get Hepatitis due to COVID-19. In a patient with abdominal pain or other liver disease symptoms while coursing with the virus or even after the infection, further investigation must be made.

Keywords: Hepatitis, COVID-19, Pediatrics, Liver, abdominal pain.

1. Introduction

Hepatitis is the inflammation of the liver tissue that may result from multiple causes and the most common etiology are viruses. Patients with hepatitis may have symptoms such as fatigue, jaundice, fever, nausea, vomits, abdominal pain, weight loss, choluria, acholia, joint pain, among others.

COVID-19 is a disease caused by the virus "Severe Acute Respiratory Syndrome Coronavirus 2" (SARS-CoV-2) that was first identified in the city of Wuhan, China in December 2019.

COVID-19 in Mexico was first identified in Mexico City and Sinaloa on February 28th, 2020. Until February 25th, 2022, there were 5,763,299 positive cases and 331,958 deaths caused by the disease. (CONACYT, 2022)

The overall curse of the pandemic in the children population with COVID-19 has shown that they remain mostly asymptomatic or mildly symptomatic. The true prevalence of asymptomatic SARS-CoV-2 infection is most likely underestimated, as asymptomatic children are less frequently tested and there are other frequent pathologies frequent in children that should be considered, such as rhinovirus. (Nikolopolou, 2022)

Moreover, a recent study has shown a prevalence 5 times higher than considered in children in the USA, and a similar situation might be happening in Mexico. (Couture, 2022)

Currently, COVID-19 vaccines are not available in Mexico for children under 15 years old. However, children between 12 and 17 years old can be vaccinated if they have comorbidities such as chronic cardiac, pulmonary, gastrointestinal, neurological and endocrinological diseases; immunosuppression states as cancer, transplants, HIV, asplenia, congenital immunodeficiency disorders and Tuberculosis are also taken into account for vaccination.

Although much research has been done in the pathogenesis of COVID-19, there is still much to be discovered. It has been proved that COVID-19 affects primarily the respiratory tract, however, there have been reports about affections in different organs and systems, such as neurologic, cardiologic, rheumatologic, gastroenterologic, etc. (Peramo-Álvarez, 2021; Yang, 2020)

We present the case of a pediatric patient that was diagnosed with COVID-19

Hepatitis with uneventful resolution. With the present case report it is expected to set a precedent for further research in the area, as it is the first case of Hepatitis by COVID-19 as far as our research went.

2. Clinical case

A 12-year-old man presents with intermittent and generalized abdominal pain, which is why the patient is hospitalized for further investigation. The condition began 3 days prior to admission with

intermittent and generalized abdominal pain. Two days prior to admission, the patient vomited 3 times, each time after every meal. One day prior to admission, the patient began with orange-like urine, weakness, fatigue and hyporexia. On the day of admission, a COVID-19

RT-PCR was performed, showing a positive result. Physical Examination was not practiced due to COVID-19 positive test. Abdominal ultrasound was performed, showing no abnormalities in neither liver, gallblader, kidney, pancreas or spleen. The family denies any important diagnosed medical, familiar and psychosocial history. The patient had no history of COVID vaccines and the rest of the vaccination scheme was complete.

A comprehensive metabolic panel the first day of admission showed abnormal levels with total bilirubin of 3.2, direct of 1.78, indirect bilirubin of 1.51, AST in 1275, ALT in 1568, ALP in 499 and LDH in 752. A Complete Blood Count showed erythrocytosis, monocytosis, and eosinopenia.

Serology markers for viral Hepatitis were negative.

The therapeutic intervention included Normosol (49.3cc/h); Omeprazol (40mg); Acetaminophen (850mg); Ondansetron (8mg); and a clear liquid diet. All of this was prescribed until the patient improved the symptoms.

Patient showed good development and adequate tolerance to oral intake. 5 days later of hospitalized the bilirubin levels and the liver enzymes came back to normal levels. Due to the improvement, the patient was discharged with alarm signs.

3. Discussion

Adult patients diagnosed with COVID-19 may present hepatitis as a complication of the viral infection. Liver enzyme levels show an increase in COVID-19 patients (14.8% to 53%), and this is more common in patients with a severe infection (compared with patients with a mild illness). (Ali, 2021)

Liver function tests may be altered due to viral hepatitis, pharmacology toxicity, inflammation and disease severity. Also, these tests may be a prognosis and severity marker. (León Gómez, 2020)

Nevertheless, there is no information about liver affection due to COVID-19 in the pediatric population. Information gathered shows that liver injury in pediatric cases in 22% of the cases occurred mostly between 2 and 18 days of hospitalization. (Wang, 2020)

A study published in the United States shows an increase in mild aminotransferase level (that does not exceed 2x upper limit of normal). (Pokorska-Spiewak, 2020) Information gathered for this case report, suggest that the absence of significant respiratory or other symptoms may be associated with pediatric acute severe hepatitis and even acute liver failure. (Antala, 2022)

This is relevant because the patient did not present respiratory symptomatology, however, he did present hepatic symptomatology.

Fortunately, a COVID-19 test was performed by protocol when the patient arrived at the hospital. This, plus the symptoms described before, and the information currently published stating Hepatitis as a sequelae for COVID-19 infection.

Currently, there is no treatment for COVID-19 Hepatitis, but in the United States, the use of Remdesivir has been approved by the FDA for hospitalized patients over 12 years of age and weighing over 40 kilograms. (FDA, 2021) This could have helped this patient (even though he did not have a severe Hepatitis) but Remdesivir has not been approved in Mexico, so symptomatic treatment was the only one used for this patient.

In Mexico, COVID-19 vaccine is not available in this population, so it could help them to be candidates to receive the vaccine. COVID-19 usually has a mild presentation in the pediatric population, but it is unclear why most children present less severe disease than adults. (Patel, 2020). This do not make it less susceptible to get infected nor to get sequelae because of the COVID-19, so it is suggested to reconsider the population who can receive the vaccine for COVID-19, and approve the vaccine for children over 5 years, as it is approved in other countries.

At first, the suspicion was an acute bowel disease because of the abdominal pain of the patient. Later, with all the symptomatology and lab tests with hepatic enzymes altered, the suspicion was Viral Hepatitis. As the serology for VAC, VBC and VBC tests were negative and the COVID-19 positive test, the main suspicion was Hepatitis due to COVID-19.

In the pediatric population 50% of COVID-19 cases have abdominal pain, among other signs and symptoms such as fever, cough and dyspnea. (Mantovani, 2021) It seems like as being a highly prevalent symptom, abdominal pain should be further analyzed and taken into consideration in the workup diagnosis of COVID-19 affection and should not be taken just as another manifestation of the broad range of symptoms.

The clinical course of COVID-19 in the pediatric population has shown to be different among its stages. Whereas the first stages (infants, toddlers, preschool) report fever, abdominal pain, and vomit, the school age and adolescents tend to show mild disease in 44.8% of the cases, respiratory tract affection in 18.5%, fever without a cause in 16-2%, multisystem inflammatory syndrome in children (MISC) in 10% and gastrointestinal tract affection only in 10%. (Cui, 2021)

There has been reported many sequels and its most common signs or symptoms due to COVID-19, such as respiratory (Diffusion Capacity of Carbon Monoxide decreased and a Restrictive Pattern), cardiac (decreased right ventricular ejection fraction, myocardial oedema suggestive of myocarditis, and fibrosis), neurological (anosmia, ageusia, headache and dizziness), psychiatric (anxiety, mood disorders and insomnia), thrombotic, (Peramo-Álvarez, 2021) gastrointestinal (diarrhea, nausea, vomiting and anorexia), and hepatic (abnormalities in liver function and hepatic enzymes) sequelae. (Yang, 2020) With all of this, COVID-19 and its pandemic has taught us that it could be everything but a mild clinical course, even in the pediatric population. Even though the clinical scenario showed an overall mild course, the sequelae are still under careful consideration and yet to be discovered.

As far as our search went, there are no reported cases of COVID-19 Hepatitis in the pediatric population. The present report serves as a precedent for further cases that might arise. It is relevant to point out the fact that hepatitis by hepatitis viruses have different courses in the long term, hence it is yet unknown the course COVID-19 hepatitis will take. It is intended to serve as a call for awareness, and to build up the literature information regarding COVID-19. As this is a disease from which we are all still learning, and the multiple manifestations it might have, it is important to consider this virus as the etiology of different clinical scenarios that we have not thought of before. Hepatitis for COVID-19 should be considered as a complication when a patient is diagnosed with the virus and has liver enzymes elevated or abdominal pain. This suspicion may apply in the adult or pediatric population.

4. Conclusion

Abdominal pain should be further analyzed and taken into consideration in diagnosis of COVID-19, not just as a common symptom. Sequelae are to be considered, even though the clinical scenario has shown to be an overall mild course. It is yet unknown what COVID-19 causes in the long term in the

liver, and it precises further investigation. We are still learning about COVID-19, so different clinical scenarios must be thought of now of the diagnosis.

5. Funding Source

Universidad Autónoma de Nuevo León, Hospital Universitario "Dr. José Eleuterio González", Department of Pediatrics, Monterrey, Nuevo Leon, Mexico.

6. Conflicts of interest

There are no conflicts of interest for this publication.

We have the permission of the patient to report this case. Manuel de la O is acting as a guarantor of the case report.

7. Special Thanks

Department of Pediatrics, Hospital Universitario "Dr. José Eleuterio González", Universidad Autónoma de Nuevo León, Monterrey, N.L. Mexico.

References

Ali, S., Prakash, S., & Murali, A. R. (2021). Hepatic Manifestations of Nonhepatotropic Infectious Agents Including Severe Acute Respiratory

Syndrome Coronavirus-2, Adenovirus, Herpes Simplex Virus, and Coxiella burnetii. *Gastroenterology clinics of North America*, *50*(2), 383–402. https://doi.org/10.1016/j.gtc.2021.02.012

Antala, S., Diamond, T., Kociolek, L. K., Shah, A. A., & Chapin, C. A. (2022). Severe Hepatitis in Pediatric COVID-19. *Journal of pediatric gastroenterology and nutrition*. https://doi.org/10.1097/MPG.0000000000003404

CONACYT. (2022, 14 marzo). *COVID-19 Tablero México*. COVID - 19 Tablero México. Recuperado 15 de marzo de 2022, de https://datos.covid-19.conacyt.mx

Couture, A., Lyons, B. C., Mehrotra, M. L., Sosa, L., Ezike, N., Ahmed, F. S., Brown, C. M., Yendell, S., Azzam, I. A., Katić, B. J., Cope, A., Dickerson, K., Stone, J., Traxler, L. B., Dunn, J. R., Davis, L. B., Reed, C., Clarke, K., Flannery, B., & Charles, M. D. (2022). Severe Acute Respiratory Syndrome Coronavirus 2 Seroprevalence and Reported Coronavirus Disease 2019

Cases in US Children, August 2020-May 2021. *Open forum infectious diseases*, *9*(3), ofac044. https://doi.org/10.1093/ofid/ofac044

Cui X, Zhao Z, Zhang T, Guo W, Guo W, Zheng J, Zhang J, Dong C, Na R, Zheng L, Li W, Liu Z, Ma J, Wang J, He S, Xu Y, Si P, Shen Y, Cai C. A systematic review and meta-analysis of children with coronavirus disease 2019 (COVID-19), J Med Virol. 2021;93(2):1057-1069. DOI: 10.1002/jmv.26398

León Gómez, J., Gómez Aldana, A. J., & Tapias Mantilla, M. L. (2020). Implicaciones hepáticas en la pandemia por COVID-19. *Revista Colombiana De Gastroenterología*, *35*(Supl. 1), 30-36. https://doi.org/10.22516/25007440.535

Nikolopoulou, G. B., & Maltezou, H. C. (2022). COVID-19 in Children: Where do we Stand?. *Archives of medical research*, *53*(1), 1–8. https://doi.org/10.1016/j.arcmed.2021.07.002

Patel N. A. (2020). Pediatric COVID-19: Systematic review of the literature. *American journal of otolaryngology*, *41*(5), 102573. https://doi.org/10.1016/j.amjoto.2020.102573

Peramo-Álvarez, F. P., López-Zúñiga, M. Á., & López-Ruz, M. Á. (2021). Medical sequels of COVID-19. *Medicina clinica (English ed.)*, *157*(8), 388–394. https://doi.org/10.1016/j.medcle.2021.04.008

Pokorska-Śpiewak, M., & Śpiewak, M. (2020). Management of hepatitis C in children and adolescents during COVID-19 pandemic. *World journal of hepatology*, *12*(8), 485–492. https://doi.org/10.4254/wjh.v12.i8.485

U.S. Food & Drugs Administration. (2021, 2 julio). *Coronavirus (COVID-19) | Drugs*. U.S. Food and Drug Administration. Recuperado 23 de marzo de 2022, de https://www.fda.gov/drugs/emergency-preparedness-drugs/coronavirus-covid- 19-drugs

Wang, D., Ju, X. L., Xie, F., Lu, Y., Li, F. Y., Huang, H. H., Fang, X. L., Li, Y. J., Wang, J. Y., Yi, B., Yue, J. X., Wang, J., Wang, L. X., Li, B., Wang, Y., Qiu, B. P., Zhou, Z. Y., Li, K. L., Sun, J. H., Liu, X. G., … Chen, Y. N. (2020). *Zhonghua er ke za zhi = Chinese journal of pediatrics*, *58*(4), 269–274. https://doi.org/10.3760/cma.j.cn112140-20200225-00138

Yang, R. X., Zheng, R. D., & Fan, J. G. (2020). Etiology and management of liver injury in patients with COVID-19. *World journal of gastroenterology*, *26*(32), 4753–4762. https://doi.org/10.3748/wjg.v26.i32.4753

RESUMEN

El COVID-19 típicamente cursa con manifestaciones clínicas leves, sin embargo, un paciente pediátrico puede presentar secuelas y complicaciones graves cuando existe una infección. No hay información sobre complicaciones hepáticas por COVID-19 en niños en México. Este reporte de caso sentará un precedente sobre el diagnóstico oportuno de hepatitis como complicación de la enfermedad COVID-19 en pacientes jóvenes en México. Caso clínico: Varón de 12 años con dolor abdominal generalizado intermitente mal diagnosticado y tratado por colon irritable 3 días antes. El dolor abdominal se mantuvo, y al día siguiente el paciente vomitó 3 veces (cada una después de cada comida). El paciente comenzó con orina anaranjada, debilidad, fatiga e hiporexia 1 día antes de su ingreso. El día del ingreso se le realizó una prueba de RT-PCR de COVID-19 dando positivo. Una vez que ingresó, se realizaron exámenes de laboratorio que mostraron un aumento de los niveles de enzimas hepáticas, lo que mostró una enfermedad hepática como complicación de la infección viral. Conclusión: Los pacientes pediátricos pueden contraer hepatitis por COVID-19. En un paciente con dolor abdominal u otros síntomas de enfermedad hepática mientras cursa con el virus o incluso después de la infección, se debe realizar una investigación adicional.

Palabras Clave: Hepatitis, Covid-19, Pediatría, hígado, Dolor Abdominal