

A concomitant Guillain-Barre Syndrome with COVID-19: a first case-report in Colombia

Nuvia Mackenzie

Center for Clinical and Translational Research, La Misericordia Clinica Internacional, Barranquilla, Colombia

Eva Lopez-Coronel

Center for Clinical and Translational Research, La Misericordia Clinica Internacional, Barranquilla, Colombia

Alberto Dau

Center for Clinical and Translational Research, La Misericordia Clinica Internacional, Barranquilla, Colombia

Dieb Maloof

Center for Clinical and Translational Research, La Misericordia Clinica Internacional, Barranquilla, Colombia

Salvador Mattar

Center for Clinical and Translational Research, La Misericordia Clinica Internacional, Barranquilla, Colombia

Jesus Tapia Garcia

Center for Clinical and Translational Research, La Misericordia Clinica Internacional, Barranquilla, Colombia

Briyis Fontecha

Center for Clinical and Translational Research, La Misericordia Clinica Internacional, Barranquilla, Colombia

Cristina Lanata

Rosalind Russell/Ephraim P Engleman Rheumatology Research Center, University of California, San Francisco, San Francisco, California, USA

Hernan Felipe Guillen-Burgos (✉ heman.guillen@unisimonbolivar.edu.co)

Center for Clinical and Translational Research, La Misericordia Clinica Internacional, Barranquilla, Colombia

Case Report

Keywords: COVID-19, SARS-CoV2, Guillain-Barre Syndrome, Case Report

Posted Date: August 19th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-61279/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: During the COVID-19 pandemic, different neurological manifestations have been published. However, few cases of Guillain-Barre Syndrome and COVID-19 have been reported. We describe a concomitant Guillain-Barre Syndrome and COVID-19 patient.

Case presentation: a 39 years old woman was admitted in a teaching hospital in Barranquilla, Colombia with a history of progressive general weakness with lower limb dominance. A previous symptom as ageusia, anosmia and intense headache was reported. On admission, facial diplegia, quadriparesis with lower limbs predominance and Medical Research Council Scale 2/5 in lower limbs and 4/5 in upper limbs was reported. During clinical evolution, due to general areflexia, hypertensive emergency and progressive diaphragmatic weakness, the patient was admitted to intensive care unit. Cerebrospinal Serum Fluid revealed protein-cytologic dissociation and electromyography test were compatible with Guillain-Barre Syndrome. By symptoms before hospitalization, SARS-CoV2 diagnostic testing was performed with positive result in second test. Management to COVID-19 and Guillain Barre Syndrome was performed and patient was discharged after 20 days of hospitalization with clinical improvement.

Conclusions: Few cases have been published reporting COVID-19 and Guillain-Barre Syndrome. We report the first confirmed case of COVID-19 with concomitant Guillain-Barre Syndrome in Colombia. In patients with Guillain-Barre Syndrome, several viral and bacterial pathogens have been found in case-control studies but there are do not clarity in what triggers the immune-mediated destruction of nerves. More studies are needed to determine possible association among COVID-19 exposure and Guillain-Barre Syndrome.

Background

A novel coronavirus emerged from Wuhan, China at the late of December generating a pandemic disease named Coronavirus disease 2019 (COVID-19) produced by SARS-CoV2 virus [1]. The rapidly spread of virus from China to Europe, United States and currently to Latin American countries has generated several deaths and cumulative cases with overwhelmed sanitary systems in countries such as Italy, Spain, U.S and several regions at South America [2] United States and Brazil are the first and second hotspots countries with more cases and deaths reported, respectively [3]. In Colombia to date, there are more than 150.000 cumulative cases and more than 5.300 deaths [4] with clusters regions such as Bogota, D.C, and Barranquilla. In this brief report, we describe a case of COVID-19 and concomitant Guillain Barre syndrome (GBS) from the Hospital La Misericordia Clinica Internacional in Barranquilla, Colombia.

Case Presentation

During midterm of April 2020, a 39 years old woman was admitted after with a 6 days history of progressive general weakness, with predominance in lower limbs. Twenty days prior admission, she began with ageusia, anosmia and intense headache with multiples consultations to external emergency rooms without improvement of symptoms. She then developed intense myalgias and leg weakness, which progressed to impossibility to walk for which she was referred to our hospital. On admission, the patient reported headache, malaise, general myalgias, cough and failure to walk. Her vital signs were blood pressure of 167/88 mmHg, heart rate 74 beats per min, respiratory rate 18 breaths per min and SaO₂ 95%. She was found to have facial diplegia, quadriparesis with lower limbs predominance, Medical Research Council (MRC) muscular strength 2/5 in lower limbs and 4/5 in upper limbs. During the clinical evolution she had general areflexia and left arm paresthesia. Her past medical history was significant for hypertension, type 2 diabetes mellitus, and cholecystectomy. She was admitted to the intensive care unit due to hypertensive emergency, and progressive diaphragmatic weakness. Initial laboratory tests are shown in Table 1 which were remarkable for leukocytosis, neutrophilia, LDH and D-Dimer elevated. CSF analysis revealed protein-cytologic dissociation. Chest X-ray and chest CT scan were normal. An electromyography test (Table 2) confirmed the clinical evaluation of a GBS diagnosis. The patient was managed with supportive care, and plasmapheresis for 5 days, one session per day. After 3 sessions, the patient had neurologic improvement. During the hospitalization the patient had two nasal swabs tested for SARS-CoV2. First RT-PCR for SARS-CoV2 was negative, however, second RT-PCR SARS- CoV2 had positive result. She received hydroxychloroquine, 400mg twice first day, continue with 200 mg BID per 10 days plus dexamethasone 8mg every eight hours during 3 days, and standard care. She did not require supplemental oxygen and no alterations were evidenced in chest images. She was discharged after 20 days of hospitalization with improvement of neurologic (MRC 4/5 in lower limbs) and respiratory symptoms.

Discussion And Conclusion

Neurological outcomes have been reported in patients with COVID-19. The neurological manifestations range from headache, dizziness, confusion, and although with few cases, more severe conditions such as encephalopathy, acute disseminated encephalomyelitis, and Guillain-Barre Syndrome, among others [5].

GBS is a neuroinflammatory disease with a global incidence of 1-2 per 100,000 person-years [6]. GBS is the most common cause of acute flaccid paralysis and diagnosis included patient history, neurological examination, electrophysiological test and cerebrospinal serum fluid (CSF) analysis [6]. Several viral and bacterial pathogens have been found in GBS patients in case-control studies but there are do not clarity in what triggers the immune-mediated destruction of nerve tissue [7]. Pathogens such as Cytomegalovirus, Epstein-Barr virus, Mycoplasma Pneumonia, Zika Virus, and the novel Coronavirus SARS-CoV2 has been reported with previous exposition to these agents and GBS outcome [8, 9, 10, 11, 12]

The first case of GBS and COVID-19 was reported in a patient with travel history to Wuhan [13] followed by other cases in countries with high incidence of SARS-CoV2 such as Italy [12], Iran [14] and Spain [15]. A possible hypothesis of GBS triggered by COVID-19 has been proposed, however only fewer cases has been reported. We speculate that whether the incidence of cases would be increasing and follow-up of recovered patients is conducted focusing on identify neurological outcomes, polyneuropathies as GBS could be found it. There is no certainty whether the infection preceded the GBS, or whether the infection is concomitant or is casualty in this group of patients. More studies are needed to determine if COVID-19 has a direct association with GBS, such as previous reported association with Zika Virus [11]. During the last outbreak of Zika Virus (ZIKV) in Colombia, the researchers reported virologic evidence of ZIKV in patients with GBS in Colombia [11].

In summary, we report the first case of GBS concomitant with COVID-19 in Colombia, with a favorable outcome. As the pandemic continues to unfold, we shall be able to see if there is a rise in GBS cases, supporting this potential association.

Abbreviations

BID: twice a day, *bis in die*

COVID-19: Coronavirus disease 2019 CSF: Cerebrospinal Serum Fluid GBS: Guillain-Barre Syndrome

LDH: Lactate dehydrogenase MRC: Medical Research Council

RT-PCR: Reverse transcription polymerase chain reaction SARS-CoV2: Severe acute respiratory syndrome coronavirus 2 ZIKV: Zika virus

Declarations

Ethical approval and consent to participate

This work was conducted according to Helsinki Declaration, Belmont Report, International Ethical Guideline for Biomedical Research Involving Human Subjects and Council of International Organizations of Medical Sciences (CIOMS). Written informed consent was obtained from the patient to participate as case- report with anonymized data.

Consent for publication

Written informed consent was obtained from the patient for publication as a case-report with anonymized data.

Available data and materials

All data are included in electronic medical record of the patient.

Competing interest

The authors declare that they have not conflict of interest.

Funding

The author(s) received no specific funding for this work.

Authors' contribution

Design of work (N.M, E.L-C, A.D, D.M, S.M, J.T.G, B.F, C.M.L H.F.G-B), acquisition and analysis (N.M, E.L-C, B.F, H.F.G-B), interpretation of data (N.M, H.F.G-B), writing and submission (N.M, C.M.L, H.F.G-B). all authors have read and approved the manuscript

Acknowledgment

Not applicable

References

1. Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., ... & Cheng, Z. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The lancet*, *395*(10223), 497-506.
2. Burki, T. (2020). COVID-19 in Latin America. *The Lancet Infectious Diseases*, *20*(5), 547-548.
3. Coronavirus Resource Center. Johns Hopkins University. Available in <https://coronavirus.jhu.edu/map.html>
4. Ministerio de Salud y Protección Social. Consultado 28 de Junio, 2020 en: <https://covid19.minsalud.gov.co>
5. Ellul, M., Benjamin, L., Singh, B., Lant, S., Michael, B., Kneen, R., ... & Solomon, T. (2020). Neurological Associations of COVID-19. *Available at SSRN 3589350*.
6. Sejvar, J. J., Baughman, A. L., Wise, M. & Morgan, O. W. Population incidence of Guillain-Barré syndrome: a systematic review and meta-analysis. *Neuroepidemiology* **36**, 123–133 (2011)
7. Hardy, T. A., Blum, S., McCombe, P. A., & Reddel, S. W. (2011). Guillain-barre syndrome: modern theories of etiology. *Current allergy and asthma reports*, *11*(3), 197-204
8. Orlikowski, D., Porcher, R., Sivadon-Tardy, V., Quincampoix, J. C., Raphaël, J. C., Durand, M. & Rozenberg, F. (2011). Guillain–Barré syndrome following primary cytomegalovirus infection: a

prospective cohort study. *Clinical infectious diseases*, 52(7), 837-844

9. An, J. Y., Yoon, B., Kim, J. S., Song, I. U., Lee, K. S., & Kim, Y. I. (2008). Guillain-Barré syndrome with optic neuritis and a focal lesion in the central white matter following Epstein-Barr virus infection. *Internal Medicine*, 47(17), 1539-1542
10. Meyer Sauter, P. M., Roodbol, J., Hackenberg, A., de Wit, M. C. Y., Vink, C., Berger, C., ... & Jacobs, B. C. (2015). Severe childhood Guillain-Barré syndrome associated with Mycoplasma pneumoniae infection: a case series. *Journal of the Peripheral Nervous System*, 20(2), 72-78
11. Parra, B., Lizarazo, J., Jiménez-Arango, J. A., Zea-Vera, A. F., González-Manrique, G., Vargas, ... & Rizcala, K. H. (2016). Guillain-Barré syndrome associated with Zika virus infection in Colombia. *New England Journal of Medicine*, 375(16), 1513-1523.
12. Toscano, G., Palmerini, F., Ravaglia, S., Ruiz, L., Invernizzi, P., Cuzzoni, M. G., ... & Cavallini, A. (2020). Guillain-Barré syndrome associated with SARS-CoV-2. *New England Journal of Medicine*.
13. Zhao, H., Shen, D., Zhou, H., Liu, J., & Chen, S. (2020). Guillain-Barré syndrome associated with SARS-CoV-2 infection: causality or coincidence? *The Lancet Neurology*, 19(5), 383-384
14. Sedaghat, Z., & Karimi, N. (2020). Guillain Barre syndrome associated with COVID-19 infection: a case report. *Journal of Clinical Neuroscience*.
15. Romero-Sánchez, C. M., Díaz-Maroto, I., Fernández-Díaz, E., Sánchez-Larsen, Á., Layos-Romero, A., García-García, J., ... & Gracia-Gil, J. (2020). Neurologic manifestations in hospitalized patients with COVID-19: The ALBACOVID registry. *Neurology*.

Tables

Table 1. Admission laboratory testing.

Laboratory testing at admission		
Complete blood count		Reference range
Total leukocyte count	12.57 (10 ³ /mm ³)	4 - 10.04 (10 ³ /mm ³)
Neutrophils	79.9 %	34 - 71.1 %
Lymphocytes	13 %	19.3 – 51.7 %
Monocytes	6.6 %	4.7 – 12.6 %
Eosinophils	0.4 %	0.7 – 5.8 %
Basophils	0.1 %	0.1 – 1.2 %
Hematocrit	35.6 %	34.1 – 44.9 %
Hemoglobin	11.2 gr/dL	11.2 – 15.7 (gr/dL)
Platelets	232 10 ³ uL	150 – 450 (10 ³ uL)
Electrolytes		
Sodium	136 mmol/L	135 – 148 mmol/L
Potassium	4.57 mmol/L	3.3 – 5.1 mmol/L
Chloride	96.5 mmol/L	98 - 107 mmol/L
Blood Glucose Level		
Glycemia	240 (mg/dL)	70-105 (mg/dL)
Others		
Lactate dehydrogenase	306 (U/L)	140 – 280 U/L
Ferritin	114.5 ng/mL	15 -150 ng/mL
D-dimer	517 ng/mL	<250 ng/mL
Serum creatinine	0.51 mg/dl	0.5 – 1.1 mg/dl
Erythrocyte sedimentation rate (ESR)	65	0- 25 mm/hour

Table 2. Electromyography test

Nerve conduction study	Stimulation point	Record point	Distal latency (ms)	Amplitude (mV)	Velocity (m/s)
Motor NCS					
Right tibial nerve	Ankle-popliteal fossa	ABD halluc brevis	14.1	3.2.	19.9
Right common peroneal nerve	Ankle-head of fibula	EXT digitorum brevis	13.7	3.0	19.4
Left tibial nerve	Ankle-popliteal fossa	ABD halluc brevis	14.7	3.4	19.7
Right median nerve	Wrist-elbow	ABD pollicis brevis	26.3	4.2	23.8
Left median nerve	Wrist-elbow	ABD pollicis brevis	24.2	4.5	23.4
Sensitive NCS					
Rigth sural nerve	Ankle	Calf	14.9	3.2	-