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

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Case Report

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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, quadriplegia 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, quadriparesthesis 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.

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**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

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**Tables**
| Laboratory testing at admission                          | Reference range                      |
|----------------------------------------------------------|---------------------------------------|
| **Complete blood count**                                 |                                       |
| Total leukocyte count                                    | 4 - 10.04 (10^9/mm^3)                 |
| Neutrophils                                              | 34 - 71.1 %                           |
| Lymphocytes                                              | 19.3 - 51.7 %                         |
| Monocytes                                                | 4.7 - 12.6 %                          |
| Eosinophils                                              | 0.7 - 5.8 %                           |
| Basophils                                                | 0.1 - 1.2 %                           |
| Hematocrit                                               | 34.1 - 44.9 %                         |
| Hemoglobin                                               | 11.2 - 15.7 (gr/dL)                   |
| Platelets                                                | 150 - 450 (10^3 uL)                   |
| **Electrolytes**                                         |                                       |
| Sodium                                                   | 135 - 148 mmol/L                      |
| Potassium                                                | 3.3 - 5.1 mmol/L                      |
| Chloride                                                 | 98 - 107 mmol/L                       |
| **Blood Glucose Level**                                  |                                       |
| Glycemia                                                 | 70-105 (mg/dL)                        |
| **Others**                                               |                                       |
| Lactate dehydrogenase                                    | 140 - 280 U/L                         |
| Ferritin                                                 | 15 - 150 ng/mL                        |
| D-dimer                                                  | <250 ng/mL                            |
| Serum creatinine                                         | 0.5 - 1.1 mg/dl                       |
| Erythrocyte sedimentation rate (ESR)                     | 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 digitum 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**      |                   |              |                    |                |                |
| Right sural nerve      | Ankle             | Calf         | 14.9              | 3.2            | -              |