



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



# COVID-19-associated Guillain–Barrè Syndrome and Urinary Dysfunction: A case report

Marilena Gubbiotti <sup>a,\*</sup>, Wally Mahfouz <sup>b</sup>, Anastasios D. Asimakopoulos <sup>c</sup>, Ludovica Durante <sup>a</sup>, Giacomo Maria Pirola <sup>a</sup>, Daniele Castellani <sup>d</sup>, Emanuele Rubilotta <sup>e</sup>

<sup>a</sup> San Donato Hospital, Department of Urology, Arezzo, Italy

<sup>b</sup> Alexandria University, Department of Urology, Egypt

<sup>c</sup> Policlinico Tor Vergata Foundation, Urology Unit, Rome, Italy

<sup>d</sup> Le Marche Polytechnic University, Department of Urology, Ancona, Italy

<sup>e</sup> A.O.U.I. Verona University, Department of Urology, Italy

## ARTICLE INFO

### Keywords:

Guillain–Barrè Syndrome  
COVID-19  
Urinary dysfunction  
Urinary retention  
SARS-CoV-2

## ABSTRACT

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) viral infection can cause multiple systemic and neurological complications, including Guillain–Barrè Syndrome (GBS). In this report we describe for the first time, urinary dysfunction in a patient with COVID-19. We reported a 41-years-old female patient with complaints of an increased generalized muscular weakness associated with progressive difficulty in walking. Four days earlier, patient complained of fever, diarrhea, and general weakness, and the RT-PCR was positive for COVID-19 infection. Due to the worsening of neurological symptoms, a neurophysiological examination on nervous conduction was performed and the diagnosis was suggestive of GBS. Two weeks later, patient developed two consecutive episodes of acute urinary retention that requested the placement of indwelling transurethral catheter. Patient started assuming selective alpha-1 adrenergic antagonist in association with 4 clean intermittent catheterization/die. Four months later, women continued the therapy and the ultrasound evaluation revealed non-pathologic post-void residual volume. Therefore, patient started to void spontaneously again and alpha-blockers were discontinued. We report for the first time a case of severe voiding disorder in a patient with COVID-19 associated GBS. Timely bladder drainage should be adopted to avoid irreversible detrusor damage.

## 1. Introduction

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) may be associated to neurological complications, such as cerebrovascular diseases, ataxia, encephalopathy and impaired consciousness (somnolence, stupor, and coma) [1]. Few reports of Guillain–Barrè Syndrome (GBS) following SARS-CoV-2 infection have been also reported [2]. GBS is an acute immune-mediated disease of the peripheral nerves and nerve roots (polyradiculoneuropathy) that is usually elicited by various infections [3]. The main clinical manifestation is generally progressive, ascending, symmetrical flaccid limbs paralysis, along with areflexia or hyporeflexia and with or without cranial nerve involvement [4]. To our knowledge, no data regarding urinary dysfunction in patients affected by Covid19-associated GBS have been reported. This report describes the case of a female patient with de novo urinary dysfunction due to GBS following SARS-CoV-2 infection.

## 2. Case presentation

A 41-year-old woman with hypothyroidism, completely self-sufficient, with no history of neurological (Barthel Index pre-event: 100), urological and bowel diseases, arrived to our attention complaining of fever, malaise, diarrhea and general weakness on October 7, 2020. SARS-CoV-2 polymerase chain reaction (PCR) nasopharyngeal swab was performed and tested positive. She did not receive any specific treatment for COVID-19. Four days later, she complained of an increased generalized muscular weakness, particularly of the lower limbs with pain and tingling sensation, associated with progressive difficulty in both walking and standing up. On October 13, 2020, she was referred to the emergency department. Her clinical examination revealed no fever, severe weakness in both legs, inability to walk, coordination problems, unsteadiness combined to sensory symptoms as lower limbs paresthesia. On neurological examination, no alteration of

\* Correspondence to: San Donato Hospital, Department of Urology, Pelvic Unit, Arezzo, 52100, Italy.

E-mail addresses: [marilena.gubbiotti@gmail.com](mailto:marilena.gubbiotti@gmail.com) (M. Gubbiotti), [wallymahfouz77@gmail.com](mailto:wallymahfouz77@gmail.com) (W. Mahfouz), [tasospao2003@yahoo.com](mailto:tasospao2003@yahoo.com) (A.D. Asimakopoulos), [ludovicadurante89@gmail.com](mailto:ludovicadurante89@gmail.com) (L. Durante), [gmo.pirola@gmail.com](mailto:gmo.pirola@gmail.com) (G.M. Pirola), [castellanidaniele@gmail.com](mailto:castellanidaniele@gmail.com) (D. Castellani), [emanuele.rubilotta@aovr.veneto.it](mailto:emanuele.rubilotta@aovr.veneto.it) (E. Rubilotta).

<https://doi.org/10.1016/j.contre.2022.100017>

Received 19 May 2022; Received in revised form 20 October 2022; Accepted 30 October 2022

the mental functions was encountered. However, the motor system examination revealed bilateral absence of the deep tendon reflexes in both knees and ankles with absent plantar reflex as well. Over the following 4–5 days, the severity of lower limb weakness increased along with the progressive involvement of the upper limbs. Cerebrospinal fluid analysis revealed cytoalbuminologic dissociation with 34 mg/dL of white blood cells (79% neutrophils) with normal glucose and proteins levels. On October 16, a neurophysiological examination on nervous conduction was performed, which was suggestive of a demyelinating polyradiculoneuropathy; thus, the diagnosis was viral (COVID-19) GBS. Pharmacologic treatment with intravenous immunoglobulin (IVIg) in a dose of 0.4 g/kg/day for 5 days in addition to enoxaparin 6000 UI was started.

On October 22, the patient developed acute urinary retention and an indwelling urinary catheter (IUC) was fixed. Urinary retention was diagnosed through the anamnesis and physical examination: patient complained of painful distress secondary to suprapubic discomfort, difficulty spontaneously voiding and bladder sensation was preserved. Suprapubic area, the external genitalia, the perineum and lower limbs were examined with the feedback of abdominal resentment. Transabdominal ultrasound confirmed a post-void residual urine equal to 500 mL. After catheterization, the volume of residual urine (VUR) was 520 mL. The patient also complained of *de novo* constipation. Constipation was managed with high-fiber diet, supplements and osmotic agents (Polyethylene Glycol). At 2 months from the acute event, patient complained of an improvement of bowel condition. Seven days post-treatment, the patient showed an improvement in both respiratory and neurological functions and started physiotherapy. On November 28, after a complete remission of COVID-19 infection, an attempt of IUC removal was elicited, but acute urinary retention recurred, necessitating re-insertion of IUC after 3 h after removal of the bladder catheter. Patient had a bladder sensation and she complained of a strong need to urinate with suprapubic pain before re-catheterization. Urinary retention was evaluated with ultrasonography. Severe constipation was reported during this period. Urological evaluation was performed and a selective alpha-1 adrenergic antagonist (alfuzosin, off-label therapy) in association with clean intermittent catheterization (CIC) 4 times/day, were advised. The patient's bladder sensation was present also at the time of the catheterization, remaining preserved throughout the period of the execution of CIC. At first CIC also, the volume of residual urine (VUR) was 560 ml. Afterwards, mean ( $\pm$  SD) VUR for each CIC was: 380 ( $\pm$  83) ml. At 1 and 2-months follow-up, mean ( $\pm$  SD) of VUR was progressively decreased to 230 ( $\pm$  62) ml and 190 ( $\pm$  60) ml, respectively. Further urological consultation recommended CIC to be done twice daily. Since January 23, there was a recovery of neurological signs in lower limbs and at the follow-up urological-visit on February 10, the patient was able to walk spontaneously.

On March 2, (last follow-up), patient continued to assume alfuzosin and the ultrasound evaluation revealed non-pathologic VUR. The patient was able to void spontaneously with no evidence of urinary tract infections, and no associated constipation. Alpha blockers were discontinued and the patient was advised to also suspend CIC. The lag period between motor and bladder function recovery was about 5 weeks. However, the patient still had residual motor deficits of all four limbs, particularly weakness of the lower limbs.

### 3. Discussion

In SARS-CoV-2 patients, neurological sequelae are common, including rare reports of Guillain-Barré Syndrome; however, no post-COVID-19 GBS associated with vesico-sphincter dysfunctions have been reported. Herein, we report for the first time a case of severe voiding disorder in a female patient with COVID-19 associated GBS. In such cases, prompt bladder drainage should be adopted to avoid irreversible

detrusor damage. CIC regimen may be preferable to IUC or suprapubic tube to preserve bladder capacity and function, provided that the patient maintains manual dexterity. IUC and suprapubic catheterization could be alternative when CIC is not possible to perform. Drug therapy alone is likely to be useless until the patient is cured from SARS-CoV-2, together with improvement of symptoms of GBS. In our case, almost 6 months were necessary to restore the normal voiding function of the bladder, which occurred after almost complete resolution of the symptoms of GBS.

Following the EAU and ICS Guidelines, diagnosis of urinary retention was performed only with transabdominal ultrasound, because as first line evaluation in a young patient without any pathological condition, urodynamics is not mandatory. [5] The neurological evaluation clearly identified a condition of GBS, and the urological evaluation evidently documented urinary retention. There was a quite concomitance of neurological and urological diagnosis. Therefore, urodynamics data was not necessary to achieve the diagnosis of urinary retention secondary to this neurological condition. Urodynamics may have better shown the pathophysiological mechanisms of urinary retention; however, in women affected by GBS, urodynamics diagnosis of bladder outlet obstruction due to dyssynergia/hyperactivity of the sphincter is rare, while impaired detrusor contraction is the most common finding. [6] It is crucial to highlight that this event happened during the COVID-SARS pandemic, a period of high emergency, in which many outpatient services had been closed (including urodynamics) to make room for the reception of covid-patients. Therefore, it would not have been possible to perform urodynamics for the period of severe emergency. In the future this type of case should have urodynamics in the diagnosis in order to establish a more precise diagnosis and to be able to carry out a correct follow-up.

Hence, it is likely that voiding disorders may be related to the most critical period of neurological disease. To date, the duration of urinary symptoms is not predictable in these cases. However, the duration of urinary dysfunction is likely to be related to the course of SARS-CoV-2 and GBS. In each case, it appears that a periodic bladder ultrasound, with the evaluation of the post-void urinary residual volume (PVR) should be adopted for at least six months [7].

### 4. Conclusion

Severe urinary dysfunction is rare in patients with Guillain-Barré Syndrome caused by SARS-CoV-2. Prompt treatment with bladder drainage preferably with CIC is advisable. The pharmacologic effect of Alpha-blocker medications is usually of slow onset and not clinically manifest during the acute phase of the neurologic disease. A periodic evaluation of the PVR should be adopted to monitor the evolution of the lower urinary tract voiding symptoms.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### References

- [1] A. Shingai, A. Budhiraja, Guillain-barré syndrome following SARS-COVID-19 infection: A case report from India, *Case Rep. Infect. Dis.* 27 (2021) 4676659.
- [2] L. Mao, H. Jin, M. Wang, Y. Hu, S. Chen, Q. He, J. Chang, C. Hong, Y. Zhou, D. Wang, X. Miao, Y. Li, Neurologic manifestations of hospitalized patients with coronavirus disease 2019 in wuhan, china, *JAMA Neurol.* (2020).
- [3] J.J. Sejvar, A.L. Baughman, M. Wise, O.W. Morgan, Population incidence of Guillain-Barré syndrome: a systematic review and meta-analysis, *Neuroepidemiology* 36 (2011) 123–133.

- [4] Z. Sedaghat, N. Karimi, Guillain Barre syndrome associated with COVID-19 infection: A case report, *Case Rep. J. Clin. Neurosci.* 76 (2020) 233–235.
- [5] P. Abrams, L. Cardozo, M. Fall, et al., The standardisation of terminology of lower urinary tract function: report from the standardisation sub-committee of the inter-national continence society, *Neurourol. Urodyn* 21 (2) (2002) 167–178.
- [6] R. Sakakibara, T. Uchiyama, S. Kuwabara, M. Mori, T. Ito, T. Yamamoto, Y. Awa, C. Yamaguchi, N. Yuki, S. Vernino, M. Kishi, K. Shirai, Prevalence and mechanism of bladder dysfunction in Guillain-Barré syndrome, *Neurourol. Urodyn.* 28 (5) (2009) 432–437.
- [7] A.D. Asimakopoulos, C.De. Nunzio, E. Kocjancic, A. Tubaro, P.F. Rosier, E. Finazzi-Agrò, Measurement of post-void residual urine, *Neurourol Urodyn.* 35 (1) (2016) 55–57.