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### COVID INFECTION AND GUILLAN-BARRE SYNDROME

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### კოვიდ ინფექცია და გიენ-ბარეს სინდრომი

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### რეზიუმე

**თემის აქტუალობა.** ორ წელზე მეტია COVID-19 საქართველოში, ისე, როგორც მთელ მსოფლიოში, მძვინვარებს.

**თემის მიზანია,** შემოვთავაზოთ საინტერესო კლინიკური შემთხვევა, რომელიც კოვიდ ინფექციასა და გიენ-ბარეს სინდრომს უკავშირდება. დავსახოთ პრევენციის გზები.

**გამოყენებული მასალა და მეთოდები.** ჩვენს მიერ შესწავლილი იყო კლინიკაში კოვიდ ინფექციის დიაგნოზით პაციენტები 2020 წლის ოქტომბრიდან 2021 წლის პირველ თებერვლამდე. სულ კლინიკას მომართა 544 პაციენტმა, სტაციონარული მკურნალობა ჩაიტარა 477 პაციენტმა. აქედან კაცი 242- იყო, ქალი-240. მათგან მხოლოდ ერთს. ხოლო პოსტკოვიდურ პერიოდში ორი კვირიდან სამ თვემდე სტაციონარს მომართა 270 პაციენტმა, მათგან მხოლოდ 3 მათგანს დაუფიქსირდა გიენ-ბარეს დაავადება.

სტატიაში ვახილულია ორი შემთხვევა ჩვენს კლინიკაში მოხვედრილი სამი პაციენტიდა, რომელთაც გიენ-ბარეს სინდრომი დაუდასტურდათ

ჩვენი აზრით, დიაგნოზის დასასმელად საკმარისია პაციენტის სიმპტომების გათვალისწინება და მისი ფიზიკური შემოწმება. ამ დაავადების ტიპურ სურათს წარმოადგენს კუთების (პროგრესირებადი) სისუსტის სწრაფი გამოვლენა, რასაც თან სდევს რომლებიც სხეულის ორივე მხარეს უჩვეულო შეგრძნებები, მყეს-ძვალთა არეფლექსია. ამრიგად, პირველი დიაგნოსტიკური ნაბიჯები ანამნეზის შეკრება და პაციენტის გასინჯვა იყო, შემდეგ ჩატარდა ლუმბალური პუნქცია. თავისა და ზურვის ტვინის გამოსაკვლეველ ასევე ჩატარდა ელექტრომიოგრაფია – ჩონჩხის კუნთების ელექტრულ პოტენციალთა რეგისტრაცია ნერვებისა და მათ მიერ ინერვირებული კუნთების მოქმედებას გამოსაკვლეველად. სადაც ნერვის გამტარობა ნელა და ბევრად ჩამორჩებოდა ნორმას. ასევე ჩატარდა ხერხემლის მაგნიტურ-ბირთვულ რეზონანსული კვლევა, სადაც ზურვის ტვინის ფესვები ზომებში მომატებული .

ამრიგად, SARS-CoV-ის ინფექციის დროს ზიანდება პერიფერიული ნერვული სისტემა. საჭიროა ყურადღება მივაქციოთ იმ კოვიდპაციენტებს, რომლებშიც დაავადების პირველი ნიშანი სწორედ ნევროლოგიური გამოვლინება შეიძლება იყოს. დაავადების ადრეულ ეტაპზე დიაგნოსტიკა მისი სწორად მართვისთვის და ვირუსის გავრცელების თავიდან ასაცილებლად იქნება მნიშვნელოვანი. დაავადების პრევენცია გულისხმობს სამედიცინო დანესეებულებაში დროულ მიმართვას, რადგან დაავადების პროგნოზი პირდაპირ არის დამოკიდებული დროულად ჩატარებულ გამოკვლევებსა და მკურნალობაზე.

**INTRODUCTION.** For three years COVID-19 has been raging in Georgia as well as all over the world. Many clinics including ours have become a battle place against covid infection [1,2]. According to scientists lengthening of symptoms is very common for many virus and bacterial infections [5,6,7]. MERS-CoV can cause severe scattered encephalomyelitis. There were cases of encephalitis after brainstem infection and Guillan-Barre syndrome. Severe scattered encephalomyelitis can be formed in case of HCoV-OC43 infection. Immunosuppressed people are particularly at high risk. The virus was found in the brain tissue of immunosuppressed people having encephalomyelitis caused by HCoV-OC43. The same doubt exists towards SARS-CoV2 [1,2,3,4].

The Guillan-Barre syndrome is not uncommon in the post infection period. The frequency of Guillan-Barre syndrome after 30 days from any kind of flu equals 16,6 cases from 100 000 people (in vaccinated people the frequency is 0,76 from 100 000 people). In Great Britain 21,5 Guillan-Barre cases were described for every 10 million vaccinated people during 6 weeks after the vaccination [8,9].

**MATERIAL AND METHODS.** We have studied patients with covid infection in our clinic from October 2020 to February 2021. In total 544 patients were admitted to the clinic, 477 were treated on a stationary basis. Among them 242 were men and 240 – women, the median age was 47 years. In the post-covid period 270 patients were re-admitted to clinic within two weeks to three months. Among them only 3 had Guillan-Barre disease (GBS). All the patients had a Brighton criteria level of diagnostic certainty 1 or 2.

The majority of the patients were admitted to the intensive care unit for severe respiratory distress, and peripheral nervous system involvement became evident at weaning off sedation and gaining conscience. In accordance with the Brighton criteria, the interval between coronavirus diagnosis and the beginning of weakness was between 24 h and 35 days.

The aim of our manuscript is to introduce interesting clinical cases which are related to covid infection associated Guillan-Barre syndrome and to find ways of prevention.

**RESULTS.** Patient - 61year-old male, had covid-19 one month prior to the onset of symptoms. Disease started with severe tiredness, weakness of lower limbs and progressed during the day. Symptoms started in both limbs with symmetrical muscle weakness, which started from the proximal parts of lower limbs and spread to upper limbs in several hours. The weakness was followed by paresthesia in fingers. Paresthesia (a feeling of an ant crawling) and numbness of legs “socks” and hands – as “gloves” was accompanied by pain in the back area. There were autonomic changes, including increased blood pressure, sinus tachycardia, sweat, face reddening, reflexes were decreased and later disappeared. We diagnosed the person by clinical symptoms, nerve conduction studies, analysis of cerebrospinal fluid, MRI of the spine was done as well.

A female patient, 55 years old, on admission to the clinic, was complaining about balance difficulty and inability to walk or climb stairs, difficulties in face and eye movement, including swallowing, chewing and speaking, severe pain in limbs and back, which worsened at night, complications in urination and defecation, accelerated heartbeat, breath difficulties. When she was admitted to the clinic she had symmetrical weakness – areflexia, atonia, the feeling of pin pricking in fingers and toes, ankles and wrists, leg weakness which later spread to the upper part of the body.

On the eighth day a patient had dry cough and  $38 \pm 2^\circ \text{C}$ . We have seen vitreous blurring of both lungs with X-ray images of chest cavity. The analysis of nose smear confirmed positive analysis of SARS-CoV-2. After three days the strength in lower limbs was 4 points, but in the upper limbs it was 3, clinical laboratory analysis showed lymphocytopenia. On the fifth day there weren't F waves during nerve conduction studies.

To diagnose this patient, we took into consideration the patient's symptoms and her physical check-up. The typical image of this disease is quick ongoing weakness, which is followed by unusual feelings in the limbs and areflexia. Therefore, the first diagnostic steps were to collect anamnesis and check the patient, then we did lumbar puncture. We did electromyography- electrical potential registration of skeleton muscles to examine the action of nerves and innervated muscles, where nerve conductivity was slow and significantly lagged to the norm. We also conducted MRI research on the spine, where the roots of the spinal cord were increased in size. So, during SARS-CoV infection, the peripheral nervous system damages too.

Third patient, a male, is 37 years old and became symptomatic 10 days after vaccination. The disease began with a tingling sensation in the fingers and toes, a weakness started in the feet and covered the upper extremities as well, with difficulty climbing stairs, swallowing, and speaking was affected too. Symptoms within a few days were accompanied by difficulty urinating, tachycardia, low blood pressure.

Areflexia was noted during the neurological examination. The patient underwent lumbar puncture and electroneurography, where acute motor-axonal neuropathy was seen. The patient underwent several plasmapheresis sessions after diagnosis as well as immunoglobulin was administered intravenously for five days.

About two weeks after the onset of the first symptom, the patient's condition was improved and he was able to walk independently in six months.

The patients were treated with low molecular weight heparin at high doses for primary prevention of SARS-CoV-2 induced thrombosis. In the one patient who performed CSF analysis, reverse transcription polymerase chain reaction assay on CSF for SARS-CoV-2 was negative. Nerve conduction studies demonstrated acute inflammatory demyelinating polyneuropathy in 3 cases, according to Hadden criteria.

Interestingly only three cases of GBS were admitted to our hospital. We believe it worthwhile to communicate our experience and to raise awareness to healthcare professionals dealing with COVID-19 patients regarding the frequent peripheral nervous system involvement of SARS-CoV-2 infection.

Two patients underwent a blink reflex test, which showed a demyelinating pattern in either the facial and/or the trigeminal nerves, suggesting frequent cranial nerve involvement. Neuromuscular weakness is a common occurrence in the intensive care unit; nevertheless, it is usually due to critical illness myopathy and neuropathy, the differential diagnosis of which is based on electrophysiological tests. Both of these diseases usually present as symmetric flaccid limb weakness; however, they must promptly be distinguished considering the proven effectiveness of intravenous immunoglobulin or plasma exchange in GBS. Amongst our cohort, 3 patients were treated with intravenous immunoglobulin and two received plasma exchange.

**DISCUSSION.** As COVID 19 is an easily contagious disease, which caused the worst pandemic in the 21st century, it is important to pay attention to patients whose first signs may be neurological symptoms. Diagnosis at the early stage of the disease will be important later on to manage correctly symptoms. Disease prevention means applying to the hospital on time, because disease course directly depends on relevant examination and timely treatment.

Intensivists should bear in mind that difficulties in spontaneous breathing and failure of weaning from mechanical ventilation should be a red flag of GBS. Neurologists should be aware of the major significance of proper diagnosis, as GBS related to Covid infection can be treated with excellent results. Both must have in mind that treatments, particularly efficacious when administered in the early phase of the disease.

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#### SUMMARY

**Introduction.** For three years COVID-19 has been raging in Georgia as well as all over the world. Many clinics including ours have become a battle place against covid infection.

**The aim** of this work is to introduce interesting clinical cases which are related to covid infection associated Guillain-Barre syndrome and to find ways of prevention.

**Materials and methods.** We have studied patients with covid infection in our clinic from October 2020 to February 2021. In total 544 patients were admitted to the clinic, 477 were treated on a stationary basis. Among them 242 were men and 240 – women, the median age was 47 years. In the post-covid period 270 patients were re-admitted to clinic within two weeks to three months. Among them only 3 had Guillan-Barre disease (GBS). All the patients had a Brighton criteria level of diagnostic certainty 1 or 2.

**Results and conclusion.** As COVID 19 is an easily contagious disease which caused the worst pandemic in the 21st century, it is important to pay attention to patients whose first signs may be neurological symptoms. Diagnosis at the early stage of the disease will be important to manage correctly and prevent its spread. Disease prevention means applying to the hospital on time, because disease course directly depends on relevant examination and treatment.

**Keywords:** COVID-19, Guillan-Barre syndrome

