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CASE REPORT

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# Co-occurrence of Guillain–Barre syndrome and rheumatoid arthritis in a young female: A case report from a low middle-income country

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## Key Clinical Message

We present the case of an adult female who had rheumatoid arthritis at first but later tested positive for Guillain–Barré syndrome (GBS). In symptomatic GBS patients (related to large joints), physicians (and therapists) should consider rheumatoid arthritis when risk factors are present.

## Abstract

The co-existence of GBS and other autoimmune disorders is uncommon. We present the case of an adult female who had rheumatoid arthritis at first but later tested positive for GBS. Further details are provided regarding the interdisciplinary diagnostic and therapy strategy that led to the patient's complete recovery. An adult female patient with rheumatoid arthritis presented with progressive weakness in her lower limbs, affecting her arm and causing numbness in her left hand and bilateral lower limbs. She has not passed stool for the last 2 days and has experienced gastroenteritis with watery, profuse diarrhea. On admission, the patient was awake, alert, and able to communicate. She had a thorough history of vital signs, with no signs of dehydration, jaundice, pallor, or edema. The patient's lower limbs were hypotonic and her upper limbs were normal. She experienced loss of sensation in her lower limbs, vibration, and proprioception. The patient's EMG-NCS report indicated sensory and motor axonal neuropathy (AMSAN variant). Plasmapheresis sessions were finished in our patient, and a very good result was achieved. In symptomatic GBS patients (related to large joints), physicians (and therapists) should consider rheumatoid arthritis when risk factors are present. Appropriate clinical treatment, which includes prompt evaluation of alternate diagnoses in the case of therapeutic failure, can improve patient outcomes.

**KEYWORDS**

autoimmune disease, case report, GBS, physiotherapy, plasmapheresis, rheumatoid arthritis

## 1 | INTRODUCTION

Guillain–Barré syndrome (GBS) is an immune-mediated polyneuropathy that, despite its rarity, is the most prevalent cause of nontrauma-related acute neuromuscular paralysis. It is an acquired syndrome characterized by gradual, symmetrical tingling, and weakening at the proximal and distal extremities. Muscle stretch reflexes are diminished or nonexistent, and sensory loss is frequent. Males seem to be afflicted more often than females, while adults and older people seem to be more likely to develop the condition.[1]

Rheumatoid arthritis is another autoimmune disease that produces joint stiffness, immobility, swelling, and discomfort. Although the precise etiology of the condition is still unknown, it is assumed that environmental, hormonal, and genetic factors contribute to RA. An increased chance of getting RA exists among smokers, women, and those with a family history of the disease.[2]

It is uncommon for GBS and other autoimmune conditions to co-occur. We describe the case of an adult female who initially had rheumatoid arthritis but subsequently tested positive for GBS. The interdisciplinary diagnosis and therapeutic approach that resulted in the patient's full recovery are further described. According to the SCARE (Surgical CAse REport) standards, this work has been reported.[3]

## 2 | CASE PRESENTATION

A female patient in her 30s with a known case of rheumatoid arthritis for 10 years presented with a few day's history of progressive weakness in her lower limbs. The weakness progresses over hours to involve the arm. Since morning, the patient has been unable to stand or walk despite having reasonable strength. She also complained of numbness in the bilateral lower limbs and left hand. At that time, no difficulty in breathing was documented. The patient has not passed stool for the last 2 days. One week before admission, she had an episode of gastroenteritis with watery, profuse diarrhea lasting for 3–4 days, 4–5 episodes per day, foul-smelling and associated with abdominal cramps, nausea, body aches, and fatigue.

On admission, an anxious but otherwise healthy-looking, well-nourished young woman was awake, alert, and able to communicate, giving a thorough history with the vitals of temperature A/F, pulse 86 beats/min, respiratory rate 18 breaths/min, blood pressure 130/80 mmHg, and satO2 of 97% on room air indicating. There were no signs of dehydration, jaundice, pallor, or edema. No sign of respiratory distress. Air entry was equal on both sides, and the chest was clear. All pulses were present, there was mild tachycardia, no raised JVP, the apex beat was normally placed, and no murmurs were appreciated. The abdomen was hard and non-tender. Bowel sound present. The bladder was palpable, indicating urinary sphincter involvement. Higher functions were intact; gait could not be assessed because the patient was unable to walk or stand by herself; weakness was ascending and symmetrical. No cranial nerve involvement was appreciated.

Left Lower limb power was ⅖, Right lower limb power was 3/5, and Upper-limb left power was ⅘. The upper-limb right power was 5/5. The lower limbs, left and right, and the left upper limb were hypotonic; the upper limb's right tone was normal. Lower limb reflexes were 0/4 (areflexia). Upper-limb reflexes were 2+. Planters were mute. No primitive reflexes were elicited. Loss of sensation in the bilateral lower limbs, as well as loss of vibration and proprioception, were also present. Patients complained of paresthesias and numbness beginning in the toes and fingertips and progressing upward to the left wrist and bilateral ankles.

All relevant workups were sent. An IV line is maintained. As per her EMG-NCS report, she has sensory and motor axonal neuropathy (AMSAN variant).

### 2.1 | EMG-NCS report

#### 2.1.1 | Interpretation

Bilateral median and ulnar motor nerves have normal amplitudes, normal distal latencies, normal conduction velocities, and normal F-wave latencies. Bilateral posterior tibial nerves have low amplitudes, normal distal latencies, normal conduction velocities, and normal F-wave latency on the right and unrecordable F-wave latency on the left side. The right peroneal and posterior tibial nerves have normal amplitudes, normal distal latencies, normal conduction velocities, and normal F-wave latencies. The right peroneal (EDB) nerve has normal amplitudes, normal distal latency, normal conduction velocity, and normal F-wave latency. The left peroneal (EDB) is unrecordable. The bilateral peroneal (TA) nerve has normal amplitude on the right and low on the left, normal distal latencies, and normal conduction velocities. Bilateral facial nerves have normal amplitudes and normal distal latencies. Bilateral median and ulnar sensory nerves have normal amplitudes, normal peak latencies, and normal conduction velocities. Bilateral sural nerves are not recordable. The H-reflex is unrecordable on the left and poorly formed on the right side.

She was diagnosed with GBS. The patient was on conservative management. Close monitoring of motor autonomic (BP, pulse, and respiratory rate) was done. Skin

integrity, color and moisture, texture, temperature care, and 2-hourly positioning were done as per the established turning protocol. As soon as the diagnosis was made, plasmapheresis sessions were started. The following medical tests Amylase, ANA profile, anti-CCP, APTT, vitamin B12, calcium (CA), complete blood count (CBC), fibrinogen, potassium (K), liver function tests (LFT), lipase, magnesium (MG), phosphate (PO4), prothrombin time/international normalized ratio (PT/INR), total leukocyte count (TLC), thyroid-stimulating hormone (TSH), urinalysis with CBC and electrolytes (U/C/E), and vitamin D are analyzed from Jan 14, 2023 to Jan 20, 2023 details of which are shown in Table 1.

Following the plasmapheresis sessions, the patient's clinical condition gradually improved over 2 weeks. The patient received intense physiotherapy, and her symptoms continued to resolve with time. Post-plasmapheresis sessions, she regained her motor and sensory function, and she was able to walk again, although some residual weakness remained in her lower limb. She has a good prognosis and is expected to be fully recovered within 7–10 months.

## 3 | DISCUSSION

The autoimmune disease rheumatoid arthritis can cause agonizing pain and have a significant influence on a person's quality of life. It is a chronic, systemic inflammatory disease that is mostly caused by auto-antibodies that are aimed at small joints and organs.[4] Infection is more common in RA patients; however, it can be difficult to discern between infection and inflammation in this disease. In this report, we discuss the case of an adult female patient who had had rheumatoid arthritis for 10 years and had recently developed growing weakness in her lower limbs. Later, diagnosed with GBS. The distinguishing feature of our case was the emergence of GBS along with rheumatoid arthritis. GBS affects peripheral nerves and is an autoimmune demyelinating polyneuropathy. Muscle weakness and possibly paralysis follow this injury. GBS is an uncommon disease since, according to the CDC, only 3000–6000 Americans develop it annually.[5] Numerous pathogens were discovered to be linked to GBS, including Campylobacter jejuni, Mycoplasma pneumoniae, the influenza virus, Epstein–Barr virus, hepatitis, HIV, and others.[6] Our patient came with symptoms indicative of GBS. She had gone through a period of symmetrical and rising weakness. Feeling loss in both lower limbs. Proprioception and vibration loss were both evident. Patients reported paresthesias, or numbness, that started in their toes and fingertips and spread up to their left wrist and both ankles. Our patient's electromyogram and nerve conduction study indicated sensory motor axonal polyneuropathy, which is regarded as an AMSAN variant of GBS (acute motor sensory axonal neuropathy). These tests were used to corroborate the diagnosis of GBS. AMSAN is one of the uncommon GBS variants. Axonal loss of both motor and sensory nerve fibers is the main pathophysiology. AMSAN has a quick start and more severe symptoms, which makes it significantly more disabled. The positive ANA blot test verified that the condition was GBS. The diagnosis was aided by laboratory tests that showed anti-SSA/RO52 antibodies in the positive range. Rheumatoid arthritis, systemic lupus erythematosus (SLE), which affects 40%–60% of patients, and Sjogren syndrome, an autoimmune illness that largely affects the salivary and lacrimal glands (up to 90% of cases), are three connective tissue disorders that are associated with SSA antibodies.[7] The sensitive biomarker of systemic inflammation known as C-reactive protein (CRP), which was shown to be elevated in our patient with a value of 30 mg/dL, may also serve as a signal for an elevated risk of developing RA. In this particular instance of overlap syndrome, three autoimmune diseases—SLE, RA, and Sjogren's syndrome—coexisted. However, lab results showed that the levels of vitamin D and vitamin B12 were insufficient, so replenishment was done. Based on the clinical symptoms and examination results, the current case's diagnosis was made. It is important to note that the patient started using HCQ and steroids as part of their therapy. The following dosages were started: 10 mg of prednisolone, 200 mg of hydroxychloroquine, 5 mg of folic acid, and 10 mg of propranolol.

Additionally, it was advised to take vitamin D3 capsules containing 2 lac units once per week for 5 weeks along with methylcobal injection 1000 mcg for 6 days, once weekly for 4 weeks, and then once monthly for 6 months. A strategy for plasmapheresis was developed with the involvement of the neuro medicine team. After five sessions of plasmapheresis, which were completed without any complications, a very satisfactory result was obtained. Over 2 weeks, the patient's clinical state steadily improved following the plasmapheresis procedures. The patient was released on oral medications after being clinically better and vitally stable. Considering that it gives a possibility for recovery, plasmapheresis should only be used in cases of severe GBS after all other treatment alternatives have been exhausted. The importance of early diagnosis cannot be overstated since efficient, supportive treatment and plasmapheresis can lower morbidity and hasten recovery.

**TABLE 1** Investigations of the patient that were performed from Jan 14, 2023 to Jan 20, 2023 (blood group O+).

| Lab | Results | | | | | |
|---|---|---|---|---|---|---|
| | **Jan 14, 2023** | **Jan 16, 2023** | **Jan 17, 2023** | **Jan 18, 2023** | **Jan 19, 2023** | **Jan 20, 2023** |
| Albumin | 2.6 | 2.8 | | 3.74 | 3.73 | |
| Amylase | 316 | | | | | |
| Ana profile | | | | | | |
| ANTICCP | <7 | | | | | |
| APTT | 29.3 | 33.3 | 22.3 | 22 | | |
| B12 | | | | | 203 | |
| CA | 8.1 | 7.7 | 8.1 | 1.0 (ionized) | 8.82 | |
| CBC | 12.3/17.5/616 | 9.6/15.7/458 | 9.1/12.6/336 | 8.8/10.4/238 | 10.5/8.9/375 | |
| Fibrinogen | | 452 | 291 | 402 | 218 | |
| K | | | | | | 4.5 |
| LFT | 0.32/0.15/0.17/11/140/26/15 | | | | | |
| Lipase | 270 | | | | | |
| MG | | 1.92 | 2.02 | | | |
| PO4 | | 2.9 | 2.7 | | | |
| PT/INR | 11.2/1.1 | 10.8/1.09 | 10.1/1.01 | 10.1/1.01 | 10.3/1.03 | |
| TLC | | | | | | 14.10 |
| TSH | 0.93 | | | | | |
| U/C/E | 17/0.6/101/129/3.3/22 | 8/0.46/101/135/3.0/20 | 10/0.46/101/136/3.8/26 | 8/0.63/100/134/4.2/29 | 13/0.53/98/135/4/22 | |
| Vit D | 11 | | | | | |

## 4 | CONCLUSION

As mentioned above, a case report is provided along with a unique complication of rheumatoid arthritis patients with GBS. In our patient, sessions of plasmapheresis were completed, and a very positive outcome was attained. When risk indicators are present, doctors (and therapists) should consider rheumatoid arthritis in symptomatic GBS patients (related to big joints). Patient outcomes can be enhanced by appropriate clinical care, which includes quick assessment of alternative diagnoses in the event of therapy failure.

## AUTHOR CONTRIBUTIONS

**Zainab Nazir:** Conceptualization; data curation; formal analysis; methodology; resources; software; writing – original draft. **Ashna Habib:** Conceptualization; data curation; formal analysis; investigation; methodology; resources; writing – original draft. **Tooba Ali:** Conceptualization; data curation; formal analysis; investigation; methodology; software; validation; writing – original draft. **Kiran Shafiq Khan:** Conceptualization; data curation; funding acquisition; methodology; software; visualization; writing – original draft. **Samar Abbas Jaffri:** Conceptualization; data curation; formal analysis; investigation; methodology; visualization; writing – original draft. **Md Ariful Haque:** Data curation; methodology; project administration; software; supervision; validation; visualization; writing – review and editing.

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## CONFLICT OF INTEREST STATEMENT

The authors declare that they have no financial conflicts of interest with regard to the consent of this report.

## DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

## ETHICS STATEMENT

Not applicable.

## CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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