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Sensory Motor Neuropathy, a Rare Presentation of Granulomatosis with Polyangiitis (GPA)

[1] Asif Islam, [2] Fatima Khurshid, [3] Rana Zohaib Munawar, [4] Tooba Fatima, [5] Muhammad Yaser Imran

[1] Assistant Professor, Department of Medicine & Rheumatologist, Ali Fatima Hospital, Lahore, Pakistan
[2] Medical Doctor, Department of Radiation Oncology, Shifa International Hospital, Islamabad, Pakistan
[3] Post Graduate Trainee, Department of Medicine, Mayo Hospital, Lahore, Pakistan
[4] Senior Registrar, Department of Medicine, Mayo Hospital, Lahore, Pakistan
[5] Assistant Professor, Department of Rheumatology, Mayo Hospital, Lahore, Pakistan

Corresponding Author: **Asif Islam**

Abstract

Granulomatosis with polyangiitis (GPA), also known as Wegener's granulomatosis, is a rare autoimmune illness characterized by necrotizing granulomatous inflammation with vasculitis of small to medium-sized blood vessels. GPA primarily affects the upper and lower respiratory tracts, as well as the kidneys, although it can also impact other organs and systems. GPA with neurological involvement is infrequent, and sensory motor neuropathy is a rare manifestation. The purpose of this case report is to present the clinical characteristics, diagnostic workup, therapy, and outcomes of a patient with sensory motor neuropathy as the early manifestation of GPA.

Keywords: Granulomatosis with Polyangiitis, GPA, Wegener's Granulomatosis, Sensory Motor Neuropathy, Autoimmune Disease, Vasculitis

Introduction

Granulomatosis with polyangiitis (GPA), often known as Wegener granulomatosis, is a rare multisystem autoimmune illness with an unknown cause [1]. GPA is a form of anti-neutrophil cytoplasmic antibody (ANCA) associated vasculitis (AAV) that primarily affects small to medium-sized arteries [2]. It can affect both men and women equally, with a reported mean age of onset of 55 years [3]. Granulomatosis with polyangiitis (GPA) is characterized by upper or lower respiratory tract symptoms as well as renal involvement. Although it usually affects the peripheral nervous system, with mononeuritis multiplex being the most common pattern, peripheral sensory-motor polyneuropathy as a presenting manifestation is quite uncommon. Digital gangrene is also relatively uncommon in GPA [4]. GPA is a relatively uncommon condition, with an estimated prevalence of 24-152 instances per million people [5]. If left untreated, the condition usually progresses quickly to death, with 82% of patients dying within a year [6]. Thus, precise and timely diagnosis of GPA is critical for improving prognosis [4]. Although a considerable proportion of GPA patients develop peripheral nervous system (PNS) dysfunction during the course of the disease, presentation with peripheral neuropathy is uncommon, as noted below. Furthermore, the prevalence of digital ischemia and gangrene in the GPA population is as low as 1%, according to the available literature [7]. We present a case of GPA with distal sensory-motor polyneuropathy and digital ischemia, both of which are unusual and uncommon symptoms of GPA.

Case Report

A 30-year-old female presented with complaints of right foot pain and edema that had persisted for three years, as well as associated bodyaches. A 3x3 cm enlargement on the right foot was discovered during a physical examinaton. Motor and sensory nerve conduction investigations were performed as diagnostic tests. The motor nerve conduction examination indicated diminished compound muscle action potentials of the right Common Peroneal nerve, as well as the absence of F-wave responses. Furthermore, compound muscle action potentials were drastically diminished in the left Common Peroneal and right Tibial nerves, with no F-wave responses. The left Tibial nerve did not respond. The sensory nerve conduction investigation revealed that the Sural and Superficial peroneal nerves were not responding. A Doppler scan of the right lower leg revealed competent saphenofemoral and saphenopopliteal junctions, as well as normal diameter and compressibility of the

common femoral, superficial femoral, and popliteal veins. There was no evidence of deep vein thrombosis or cellulitis. The laboratory results revealed abnormal liver function tests, including ALP at 104, ALT at 79, and AST at 52. The creatinine level was 0.5. At 1.89, ANCA-C was positive, whereas ANCA-P was negative. The ESR was 30 and the CBC was within normal limits. Anti-HCV and HBsAg testing came out negative. Peripheral neuropathy was diagnosed based on these clinical symptoms. The diagnosis of granulomatosis with polyangiitis (GPA) manifesting as sensory motor neuropathy was obtained based on the clinical presentation and laboratory findings. The patient was begun on high-dose corticosteroids (prednisone) as well as immunosuppressive therapy with cyclophosphamide. The patient's symptoms gradually improved over the course of several months of therapy, leading to ulcer healing and neuropathy improvement. The treatment was helpful since the patient found alleviation from their foot pain, edema, and accompanying bodyaches.

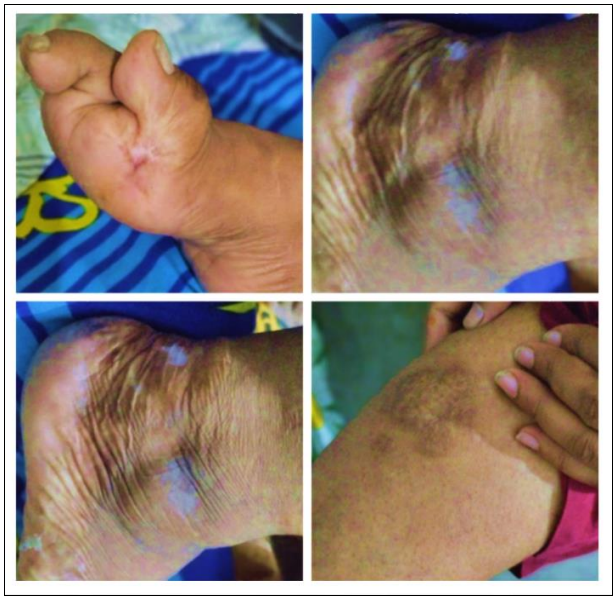

Fig 1: Post Treatment healed ulcer

Discussion

Granulomatosis with Polyangiitis (GPA) is a rare autoimmune condition that damages blood vessels and can cause a variety of symptoms, including involvement of the pulmonary, renal, and peripheral neurological systems. Sensory motor neuropathy is a rare form of GPA, with only a few cases recorded in the literature [8]. Up to 90% of individuals with GPA initially appear with upper airway disease, which also frequently involves the ears, nose, and throat. Other clinical symptoms that may be present in patients with lung or airway involvement include cough, dyspnea, stridor, wheezing, and hemoptysis. A common occurrence is renal involvement, with glomerulonephritis eventually occurring in 77–85% of patients over the course of the disease. Leukocytoclastic angiitis, urticaria, livedo reticularis, and nodules on the skin, as well as uveitis, conjunctivitis, episcleritis, scleritis, corneal ulceration, optic neuropathy, and retinal vasculitis in the orbits, are additional locations where GPA can present [9, 10, 11]. Neurologic symptoms of GPA are rare at the time of presentation. They may exhibit numerous mononeuritis, sensory neuropathy, abnormalities of the cranial nerves, mass lesions of the central nervous system, external ophthalmoplegia, and sensorineural hearing loss [12]. Clinical signs of peripheral and central nervous system involvement can also be seen in GPA patients. The most prevalent condition in this population is peripheral neuropathy. Rarely does the central nervous system get involved. In a study of 128 GPA patients, De Groot *et al*. found that over half of the patients experienced neurologic symptoms. Only 7% of individuals had central nervous system involvement, whereas 43.8% of those had peripheral nervous system involvement in the form of sensorimotor polyneuropathy or mononeuritis multiplex [13]. In general, neurologic involvement at GPA presentation is rare. The identical observation was seen in our patient, making this instance a peculiar GPA presentation. It was difficult to diagnose two cases of small- and medium-sized vasculitis because of peroneal nerve involvement, according to Ripellino *et al* [14].Uncertainty surrounds the pathophysiology of the neurological symptoms associated with GPA. The blood arteries supplying the peripheral nerves are thought to become inflamed as a result of immune complex deposition. As a result, there are sensory and motor deficiencies because of ischemia and injury to the nerve fibers [1]. GPA-related sensory motor neuropathy might be difficult to diagnose since a high index of suspicion is needed. Clinical manifestations of inherited neuropathies or diabetes mellitus may resemble other causes of peripheral neuropathy. However, some characteristics, such as systemic symptoms (such as fever, weight loss), upper respiratory tract involvement (such as sinusitis, otitis media), and renal abnormalities, may arouse suspicion for GPA [15]. The diagnosis of GPA depends mostly on laboratory tests. ESR and CRP levels that are elevated indicate inflammation often. Despite not being unique to this illness, the presence of c-ANCA with PR3 specificity strongly suggests GPA. To check for renal involvement, a typical symptom of GPA, renal function tests and a urinalysis should be carried out [16]. In circumstances where the diagnosis of vasculitis is in doubt, a nerve biopsy might give conclusive evidence. A necrotizing vasculitis with granulomatous inflammation in tiny blood vessels is frequently seen on histopathology. However, because nerve biopsy is an intrusive process, it should only be used when the diagnosis is ambiguous or when other therapeutic options are being examined [17]. The treatment of sensory motor neuropathy associated with GPA involves a multidisciplinary approach. It includes immunosuppressive therapy to control the underlying autoimmune process and supportive measures to manage symptoms and prevent complications. Corticosteroids, such as prednisone, are the mainstay of treatment to induce remission. Other immunosuppressive agents like cyclophosphamide, rituximab, and methotrexate may be used as adjunctive therapy or alternatives. Supportive measures include pain management, physical therapy, occupational therapy, the use of assistive devices, and regular follow-up with healthcare professionals. The treatment approach should be individualized based on the patient's specific clinical presentation and response to therapy, and consultation with specialists experienced in managing GPA is crucial [15, 18, 19].

Conclusion

In conclusion, sensory motor neuropathy associated with GPA is a rare symptom of the disease that poses diagnostic

and therapy issues. The specific mechanism driving its development is unknown, however it is thought to be associated to GPA's inflammatory and immune-mediated activities. The diagnosis is based on a thorough examination of clinical symptoms, test data, and imaging findings. Once identified, the treatment generally focuses on immunosuppressive medicine to regulate the autoimmune response. However, due to the complicated nature of neuropathy and the individual variety of patient presentations, therapy should be customized to the specific needs and reactions of each patient. Continued research and collaboration among healthcare experts with experience managing GPA and its associated neuropathy will help to future advancements in diagnostic and successful treatment techniques.

References

1. Garlapati P, Qurie A. Granulomatosis with Polyangiitis. [Updated 2022 Dec 5]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing, Jan, 2023. https://www.ncbi.nlm.nih.gov/books/NBK557827/
2. Jennette JC, Falk RJ, Bacon PA, Basu N, Cid MC, Ferrario F, *et al*. 2012 revised International Chapel Hill Consensus Conference Nomenclature of Vasculitides. Arthritis Rheum. 2013; 65(1):1-11. Doi: 10.1002/art.37715. PMID: 23045170
3. Seo P, Stone JH. The antineutrophil cytoplasmic antibody-associated vasculitides. Am J Med. 2004; 117(1):39-50. Doi: 10.1016/j.amjmed.2004.02.030. PMID: 15210387
4. Wathurapatha W, Rathnamali BGA, Dissanayake U. Sensory-Motor Polyneuropathy and Digital Ischemia: A Rare Presentation of Granulomatosis with Polyangiitis. Case Rep Rheumatol, 2021, 5353575. Doi: 10.1155/2021/5353575. PMID: 34751236; PMCID: PMC8572124.
5. Cho U, Kim SK, Ko JM, Yoo J. Unusual presentation of granulomatosis with polyangiitis causing periaortitis and consequent subclavian steal syndrome: A case report. World J Clin Cases. 2021; 9(6): 1433-1438. Doi: https://dx.doi.org/10.12998/wjcc.v9.i6.1433
6. Greco A, Marinelli C, Fusconi M, Macri GF, Gallo A, De Virgilio A, *et al*. Clinic manifestations in granulomatosis with polyangiitis. Int J Immunopathol Pharmacol. 2016; 29(2):151-159. Doi: 10.1177/0394632015617063. Epub 2015 Dec 18. PMID: 26684637; PMCID: PMC5806708.
7. Francès C, Du LT, Piette JC, Saada V, Boisnic S, Wechsler B, *et al*. Wegener's granulomatosis. Dermatological manifestations in 75 cases with clinicopathologic correlation. Arch Dermatol. 1994; 130(7):861-867. PMID: 8024273.
8. Ann George, Azin Azarfar, Shazia Bég, Maria Farooq. Case Report: GPA Presenting as Neuropathy. The Rheumatologist, December 16, 2021. https://www.the-rheumatologist.org/article/case-report-gpa-presenting-as-neuropathy
9. Gómez-Puerta JA, Hernández-Rodríguez J, López-Soto A, Bosch X. Antineutrophil cytoplasmic antibody-associated vasculitides and respiratory disease. Chest. 2009 Oct;136(4):1101-1111. doi: 10.1378/chest.08-3043. PMID: 19809051.
10. Hoffman GS, Kerr GS, Leavitt RY, Hallahan CW, Lebovics RS, Travis WD, *et al*. Wegener granulomatosis: An analysis of 158 patients. Ann Intern Med. 1992; 116(6):488-498. Doi: 10.7326/0003-4819-116-6-488. PMID: 1739240
11. Fauci AS, Haynes BF, Katz P, Wolff SM. Wegener's granulomatosis: Prospective clinical and therapeutic experience with 85 patients for 21 years. Ann Intern Med. 1983; 98(1):76-85. Doi: 10.7326/0003-4819-98-1-76. PMID: 6336643
12. Nishino H, Rubino FA, DeRemee RA, Swanson JW, Parisi JE. Neurological involvement in Wegener's granulomatosis: An analysis of 324 consecutive patients at the Mayo Clinic. Ann Neurol. 1993; 33(1):4-9. Doi: 10.1002/ana.410330103. PMID: 8388187
13. De Groot K, Schmidt DK, Arlt AC, Gross WL, Reinhold-Keller E. Standardized neurologic evaluations of 128 patients with Wegener granulomatosis. Arch Neurol. 2001; 58(8):1215-1221. Doi: 10.1001/archneur.58.8.1215. PMID: 11493161
14. Ripellino P, Varrasi C, Maldi E, Cantello R. Peroneal nerve involvement as initial manifestation of primary systemic vasculitis. BMJ Case Rep, 2014, p.bcr2014204084. Doi: 10.1136/bcr-2014-204084. PMID: 24686810; PMCID: PMC3975554
15. Lehmann HC, Wunderlich G, Fink GR, Sommer C. Diagnosis of peripheral neuropathy. Neurol Res Pract. 2020; 2:20. Doi: 10.1186/s42466-020-00064-2. PMID: 33324924; PMCID: PMC7650053.
16. Zheng Y, Zhang Y, Cai M, Lai N, Chen Z, Ding M. Central Nervous System Involvement in ANCA-Associated Vasculitis: What Neurologists Need to Know. Front Neurol. 2019; 9:1166. Doi: 10.3389/fneur.2018.01166. PMID: 30687221; PMCID: PMC6335277
17. Bennett DL, Groves M, Blake J, Holton JL, King RH, Orrell RW, *et al*. The use of nerve and muscle biopsy in the diagnosis of vasculitis: A 5 year retrospective study. J Neurol Neurosurg Psychiatry. 2008; 79(12):1376-1381. Doi: 10.1136/jnnp.2008.151126. Epub 2008 Sep 26. PMID: 18819942; PMCID: PMC2582330
18. Geetha D, Kallenberg C, Stone JH, Salama AD, Appel GB, Duna G, *et al*. Current therapy of granulomatosis with polyangiitis and microscopic polyangiitis: The role of rituximab. J Nephrol. 2015; 28(1):17-27. Doi: 10.1007/s40620-014-0135-3. Epub 2014 Sep 4. PMID: 25185728; PMCID: PMC4322237
19. Samman KN, Ross C, Pagnoux C, Makhzoum JP. Update in the Management of ANCA-Associated Vasculitis: Recent Developments and Future Perspectives. Int J Rheumatol, 2021, article-5534851. Doi: 10.1155/2021/5534851. PMID: 33927768; PMCID: PMC8049818