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Unraveling the layers: Chronic pain in autoimmune myositis through the lens of pain sensitization and co - morbidities: A case report

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Abstract
Autoimmune myositis represents a group of rare inflammatory disorders characterized by muscle inflammation, weakness, and chronic pain, often influenced by complex physiological and psychological factors. This case report presents a 19-year-old female with a history of von Willebrand disease, depression, and attention deficit hyperactivity disorder, diagnosed with autoimmune myositis who experienced chronic bilateral lower extremity pain with neuropathic features, including allodynia, weakness, and paresthesias. The patient's symptoms were refractory to conventional treatments, including non-steroidal anti-inflammatory drugs, lumbar sympathetic nerve blocks, and various pharmacological agents, leading to significant functional decline.
Pain in autoimmune myositis is attributed to nociceptor sensitization driven by inflammation, pro-inflammatory cytokine cascades, and central sensitization, which amplifies pain perception. Comorbidities such as von Willebrand disease and mental health conditions further complicates pain management. These factors precluded the patient from undergoing a thoracolumbar spinal cord stimulator trial, which requires active patient engagement and regular follow-ups. Depression and attention deficit hyperactivity disorder exacerbate pain perception and complicate adherence to treatment regimens, necessitating targeted management strategies.
This case underscores the need for a comprehensive and multidisciplinary approach to managing pain in autoimmune myositis, integrating optimized treatment of comorbid conditions and multimodal therapies. Despite its limited impact on life expectancy, autoimmune myositis significantly impairs quality of life, making effective symptom control paramount. The findings emphasize the importance of understanding the mechanisms underlying pain sensitization and the psychosocial dynamics influencing chronic pain to achieve better outcomes.

Keywords: Autoimmune myositis, inflammatory muscle disorders, chronic pain, neuropathic pain

Introduction
Autoimmune myositis (AM) encompasses a group of rare autoimmune disorders characterized by muscle inflammation and weakness [1]. It includes conditions such as polymyositis, dermatomyositis, inclusion body myositis, immune-mediated necrotizing myopathy, antisynthetase syndrome, juvenile myositis. It typically occurs in patients aged 40 to 60 or in children aged 5 to 15 years old, females affected more than males. The incidence of myositis is increasing due to the improved detection rate [1]. Common symptoms include joint and muscle pain, muscle weakness, vasculitis, and skin rash. Pain associated with AM is a complex symptom influenced by a variety of physiological and psychological factors. Management often includes anti-inflammatory medications including NSAIDs and steroids, immunosuppressive drugs and biologics including immune globulins, as well as non-pharmacological approaches such as physical therapy and occupational therapy. Patient education and psychosocial support play a significant role in understanding disease processes and ways to mitigate symptoms.

Materials and Methods
We report a case of a 19 year old female with a past medical history of von willebrand disease (vWD), depression, and ADHD, diagnosed with AM who presented to an

interventional pain clinic with complaints of chronic peripheral inflammatory and neuropathic pain with allodynia of bilateral lower extremities. The patient reported severe bilateral lower extremity pain and burning sensation with associated weakness and paresthesias and a decline in physical function and ambulation. She denied trauma or associated low back pain. She denied bowel or bladder changes and saddle anesthesia. The patient failed NSAIDs, lumbar sympathetic nerve block, and trialled opioid medications. At the time of evaluation, the patient had recently started immunoglobulin infusions with IgG and took Baclofen, duloxetine, pregabalin, trazodone and recently prescribed suboxone with suboptimal relief. As the case report is devoid of patient identifiable information, it is exempt from IRB review requirements as per Larkin Health System Research policy.

Results

Prior literature reveals patients with AM experience significantly more pain compared to other rheumatic diseases [2]. AM involves an immune mediated insult on muscle tissues resulting in significant inflammation causing sensitization of nociceptors leading to heightened pain perception [3]. Furthermore, chronic inflammation and pain can result in central sensitization, where the central nervous system becomes more responsive to pain signals [4]. This explains the patients' neuropathy and allodynia. AM also triggers a cascade of pro-inflammatory cytokines and chemokines that add to pain sensitization by modulating pain pathways peripherally and centrally. In this case, there are many barriers to overcome in order to successfully treat her symptoms. Considering her co-morbidities, the main obstacles include bleeding risk due to vWD and treatment compliance and symptom overlap due to her depression and ADHD. The patient was evaluated for a thoracolumbar spinal cord stimulator (SCS) trial but was not a candidate due to her co-morbidities. Treatment with a SCS involves commitment to regular follow ups and a proactive approach to the management of one's own pain. Considering the patient's sub-optimally controlled depression and ADHD, she was not a suitable candidate. In fact, conditions like depression can further exacerbate pain perception [3]. The patient also has a bleeding risk given her vWD, which would not preclude her from minimally invasive procedures, however would require close follow up and patient involvement in her own health. Therefore, it is important to optimally manage these comorbidities for successful pain control.

The five-year survival rate was 95% and the 10-yr survival rate was 83.8% [5]. AM does not significantly impact life expectancy, however it is a chronic illness, thus managing the symptoms are key in these conditions. Pain is one that often impacts an individual's quality of life.

Conclusion

This case highlights the complexities of managing chronic pain in autoimmune myositis and the importance of optimally treating comorbidities for successful pain control. Pain sensitization in AM is a multifaceted process influenced by many factors. Pain psychology adds a layer of complexity in management when comorbidities such as depression and ADHD are uncontrolled. Chronic pain management in patients with AM requires a thorough understanding of the pain process and comprehensive multimodal approach to not only manage AM but also comorbidity treatment optimization.

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