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Outline of Low-Dose Gabapentin in a Pediatric Patient of Case Presentation

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Abstract

Although rare, primary erythromelalgia can have a major negative impact on a person's quality of life. There is no accepted standard of care for erythromelalgia, despite the fact that many individuals with this ailment need systemic therapy. Here, we present the case of a 7-year-old girl who, following therapy with low-dose gabapentin had her erythromelalgia symptoms resolve without any negative side effects. We also go through the effectiveness and safety of using low-dose gabapentin to relieve pain in youngsters.

Keywords: Gabapentin; Pediatric; Erythromelalgia

Introduction

A rare disorder called erythromelalgia is characterised by severe burning sensation, erythema, and elevated skin temperature, usually in the hands and feet. The symptoms might range from a constant scorching agony to sporadic episodes that last anywhere from minutes to days. Extreme pain from this condition has been compared by one patient to feeling "burned alive" and like a "scorching fire inside the limbs." [1] Pediatric patients who have erythromelalgia also have significantly higher mortality rates. One child died by suicide and two patients experienced the suicide death of a sibling who had the condition, according to a retrospective analysis of 15 paediatric patients with erythromelalgia [2]. There is no accepted standard of care for erythromelalgia, despite the fact that many individuals with this ailment need systemic therapy. Here, we present the case of a 7-year-old girl who, following treatment with low-dose gabapentin, saw her erythromelalgia symptoms disappear without experiencing any negative side effects.

Case presentation

A 7-year-old girl in good health reported with 5–6 months of bilateral palmar erythema, discomfort, and pruritus that only happened when taking a shower. She also mentioned skin peeling on her hands and sporadic solitary involvement. The patient and her mother experienced severe daily distress as a result of these symptoms. When she applied cold to her pain, she felt some pain relief; when she took diphenhydramine, she felt some relief from pruritus. Physical examination revealed no anomalies, although a recent appointment with her paediatrician revealed erythema over the palms and finger pads, along with slight skin peeling on the distal left palm. An unremarkable total blood count was obtained. Reflex sympathetic dystrophy, commonly known as complicated regional pain syndrome type I, was a possible differential diagnosis, but it seemed less plausible given the bilateral nature and lack of trauma history, and sporadic pain as opposed to ongoing discomfort. 3 A primary erythromelalgia diagnosis was made for the patient. The patient and her mother decided to try oral gabapentin after debating the advantages and disadvantages of numerous topical and systemic therapy (Table 1) alternatives. A maximum dose of 25 mg/kg/day of gabapentin was prescribed for the patient, which was given in three doses of 10 mg/kg/day each. At the 4-week follow-up, it was seen that the patient had significantly improved while using an oral gabapentin regimen of 300 mg twice day (12.5 mg/kg/day). Even upon taking a shower, the patient's problems completely disappeared, according to her mother. Her mother did see that symptoms returned when gabapentin dosages were missed. There were no negative side effects found, and the twice daily dosage had no negative effects on her academic schedule. At her follow-up appointments at four and ten months, her symptoms were still under good control on this regimen. Given that she improved on this treatment, there was no genetic testing done.

Discussion

Symptoms of erythromelalgia include severe burning pain, erythema, and elevated skin temperature, mainly in the hands and feet. The syndrome exhibits characteristics of neuropathic pain, including the existence of mechanical allodynia in the affected areas and a lack of response to opiate analgesics, even if the pathophysiology of the disorder is not fully understood. 4 Pathogenic mutations in the SCN9A gene have been linked to inherited erythromelalgia. Voltage-gated sodium channel Nav1.7, which is encoded by SCN9A, boosts the excitability of sympathetic and sensory ganglia. The purpose of erythromelalgia treatment is to lessen pain and reduce morbidity. There is currently no accepted gold standard of care for the disorder, which is frequently refractory. Interventions without the use of drugs include avoiding triggers and using cooling techniques like ice baths. While safe and frequently extremely successful, these treatments are frequently unaffordable for patients who work or go to school away from home. Numerous systemic agents have been described

Table 1: Dosage of horizant for patients with restless legs syndrome in accordance with creatinine clearance.

Creatinine Clearance (mL/min)	Target Dose Regimen
>60	600 mg per day
30-59	Start at 300 mg per day and increase to 600 mg as needed
15-29	300 mg per day

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in the literature, but there aren't enough peer-reviewed research on them, particularly on kids. In a retrospective study of 32 children with erythromelalgia, some symptom improvement was noted after treatment with aspirin, non-steroidal anti-inflammatory drugs, anti-depressants, vasodilators, gabapentin, acetaminophen, and physical methods, though success with these medications was inconsistent and most were, at best, only partially effective in relieving symptoms. [3] To date, there have been no randomised controlled trials. There have only been five case studies in the literature that mention using gabapentin to treat erythromelalgia in children, and each time it was combined with another medication. In combination with mexiletine at a dose of 15 mg/kg, [4,5] symptoms disappeared after 6 weeks. After four weeks of treatment with amitriptyline at a dose of 300 mg three times per day, symptoms disappeared. Symptoms subsided after 4-6 weeks at a dose of 300 mg five times daily when combined with carbamazepine [5]. Contrarily, our example demonstrates that treatment with low dosages of gabapentin alone can successfully manage symptoms within 4 weeks. Anticonvulsant and neuromodulator gabapentin is recommended for both children and adults for a wide range of conditions, including epilepsy and neuropathic pain. It has traditionally been believed to work by binding the voltage-gated calcium channel 2-1 subunit and regulating calcium inflow, which disrupts neuronal communication and lessens the body's response to pain signalling. [6,7] More recent research suggests that gabapentin inhibits the synaptic transport of NMDA glutamate by targeting a complex of 2-1-bound NMDA; Data on gabapentin's use in the management of epilepsy suggest the drug is well-tolerated in children, despite the paucity of data on its safety for the treatment of chronic pain in children and adolescents. [8,9] A prospective evaluation of the safety and effectiveness of gabapentin in children with epilepsy revealed that it was well tolerated at dosages far higher than our 12.5 mg/kg daily regimen. 10 Sedation is the side effect of gabapentin that is most frequently observed; however, patients typically become tolerant to this within a few weeks. 1 At mean dosages of 52 mg/kg per day, children have also experienced hypersalivation, hyperactivity, nausea, vomiting, tiredness, tremor, and rash, however these adverse effects were rare.

Conclusion

Erythromelalgia is a disorder that has a high rate of morbidity and little research to support treatment options, particularly in children. In this instance, low-dose oral gabapentin was used to successfully treat a 7-year-old girl who experienced daily flare-ups of her erythromelalgia. A dose of 12.5 mg/kg taken orally twice day was adequate to treat symptoms and had no negative side effects. The effectiveness of this drug in the general population has to be investigated further.

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Declaration of conflicting interests

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