



Relationship between trigeminal neuralgia and multiple sclerosis : A Systematic Review

Leonardo José Rodrigues de Araújo Melo; Leonardo Elias Araujo dos Santos;

Francisco Luciano Honório Barreto Cavalcante; David Augusto Batista Sá Araújo; Pedro Vítor Ferreira Rodrigues; Ana Cecilia Neves Rios Parente; Ana Luiza Souza Santos; Leslie Mateus de Sousa Nunes; Cássia Caroline Aguiar da Ponte; Júlia Viana de Castro; Pedro Lucas Grangeiro de Sá Barreto Lima; Rodrigo Mariano Ribeiro; Lucas Soares Radtke;

Sophia Costa Vasconcelos; Fernando Antonio Guimaraes Junior

Universidade Federal Do Ceará(UFC), Fortaleza - CE - Brazil.

Categoria: Neuralgia do Trígêmeo e outras Neuropatias Cranianas

Introduction

Multiple sclerosis (MS) is an autoimmune disease that affects the central nervous system characterized by demyelinating lesions and clinical episodes of transient focal neurological deficits that remit. Among MS patients, there is a significant correlation with trigeminal neuralgia (TN), a condition in which chronic episodes of unilateral trigeminal nerve pain occur.

Objective

To conduct a literature review to understand the epidemiological, pathophysiological, clinical, and treatment relationship between MS and TN.

Methods

A literature search was performed using the DeCS/MeSH descriptors "trigeminal neuralgia" and "multiple sclerosis." The boolean operator 'AND' was used between the descriptors, and the search was conducted in the scientific databases PubMed and Web of Science. Inclusion criteria for articles were original research works published in English or Portuguese between 2000 and 2023.

Results

A total of 230 articles were found according to the search mechanism, of which 22 were included, analyzed by two independent authors, following PRISMA recommendations.

Regarding epidemiology, patients with MS have a significantly higher prevalence of TN than the general population, with TN being the most common neuropathic pain form related to MS. The prevalence of TN in MS patients ranges from 1.1% to 6.6%, with a higher frequency in females and older patients. Regarding pathophysiology, the relationship between TN and MS is not well understood, but preclinical studies suggest activation of glial cells and metabolic changes due to MS in the trigeminal nerve may be involved in trigeminal axis sensitization and the origin of TN. Additionally, magnetic resonance imaging (MRI) studies suggest that MS lesions in regions of the trigeminal root entry zone, trans-cisternal nerve, or pontine nucleus are more likely to develop TN, potentially indicating that TN originates from demyelination of trigeminal system afferents. Moreover, there is a significant association between TN and lesions in the anterior cingulate cortex, dorsolateral prefrontal cortex and secondary somatosensory cortex. In terms of clinical presentation, MS patients with TN experience shorter and less enduring episodes of pain than those with primary TN, but the pain is significantly more intense than in primary TN patients. As for treatment, first-line therapy for MS patients with TN includes anticonvulsants, such as carbamazepine and calcium channel blockers, like gabapentin, to alleviate neuropathic pain symptoms. Tricyclic antidepressants like amitriptyline have also shown significant effects on neuropathic pain. Opioids, such as morphine and oxycodone, are second-line treatments, primarily for acute crises, but are used cautiously due to the risk of dependency.

Surgical treatments are indicated for refractory patients, with microvascular decompression being more effective in patients with lower MS symptom burdens and less medication use. Another treatment with similar effectiveness is trigeminal nerve glycerolysis. Gamma Knife Radiosurgery is a non-invasive radiosurgery where two gamma ray beams are directed at TN lesions, and it has proven highly effective with low symptom recurrence in patients with both TN and MS.

Conclusion

Patients with MS have a statistically significant association with TN compared to the general population and experience TN symptoms more frequently and intensely. The pathophysiological relationship between TN and MS is not well understood, but there is a correlation between increased TN in MS patients with lesions near the pons. First-line treatment for MS patients with TN primarily includes gabapentin and carbamazepine, while surgical treatments are indicated for refractory patients. Further studies are needed to understand the relationship between MS and TN, particularly those correlating MS lesions with TN.

Keywords: Multiple sclerosis; Trigeminal neuralgia; Systematic Review.