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Opinion

Trigeminal Neuralgia: A Nerve Disorder

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Trigeminal neuralgia, also called tic douloureux, is a nerve disorder characterized by lancinating attacks of severe facial pain [1]. This disorder is generally caused by demyelination of trigeminal sensory fibers within the nerve root or brainstem [2]. Due to its initial appearance in the two lower branches of the trigeminal nerve, it is frequently mistaken as a tooth problem [3].

The incidence of trigeminal neuralgia is about 4-5:100,000 [4]. In 90% of the cases, the symptoms begin after age 40, thus the diagnosis is most common after age 50 [1,4]. There does not seem to be a particular ethnic group, climate or geographical area where trigeminal neuralgia is more prevalent [1]. This disorder occurs in both gender, but 1.5 times more common in women than in men [4]. Despite familial cases of trigeminal neuralgia have been reported, most cases occur spontaneously [1].

The cause of trigeminal neuralgia pain attacks is unknown. Compression of the trigeminal nerve via benign tumors and vascular abnormalities may affect the development of clinical symptoms [5]. The description of the pain is crucial-it must be lancinating, shooting, sharp and electric shock. Ordinary stimuli including eating, shaving, washing, cold and warmth might cause the pain [4]. Some patients experience continuous pain in addition to the paroxysmal pain. And, the continuous pain is generally present during the same periods as the paroxysmal pain. After a paroxysmal attack, a lot of patients have a refractory period during which no additional attacks can be elicited [6].

Trigeminal neuralgia is divided into classical trigeminal neuralgia which is characterized by abrupt onset and termination of unilateral brief electric shock-like pain, and secondary trigeminal neuralgia which is caused by major neurological disease such as multiple sclerosis or a tumour of the cerebellopontine angle [5,6]. MRI (Magnetic resonance imaging) and three-dimensional fast-in-flow with steady-state precession MRI could be performed to detect the presence of tumors or plaques of multiple sclerosis, and also determine deformations and compressions of the trigeminal nerve [7].

Two drugs-carbamazepine and oxcarbazepine- are considered as first-line therapy for trigeminal neuralgia. According to the studies, lamotrigine, tocainide and pimozide have good efficacy to control of pain attacks [8]. Various operative interventions such as microvascular decompression, stereotactic radiosurgery, percutaneous balloon compression, percutaneous radiofrequency or glycerol rhizotomy could be applied for people who are treatment-refractory [9]. Also, targeting calcitonin gene-related peptide may be a potential mechanism of pain relief due to many similarities in the pathophysiology and efficacy of drug therapies for trigeminal neuralgia and migraine [10].

Only a very small number of trigeminal neuralgia animal models have attempted to simulate the demyelination of the prepontine segment of the trigeminal nerve, and other models have been based on more peripheral trigeminal nerve trauma [6]. But unfortunately, to our knowledge, there is no animal model which satisfies the requirements for a trigeminal neuralgia model [11].

The molecular mechanisms behind trigeminal neuralgia are still unknown. Therefore, future studies, also including animal models, should be conducted to identify etiological components, sensory functions and genetics of this disorder, to determine the results and side effects of neurosurgery, and to discover new drugs and treatment options.

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