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Systematic Literature Review of Cognitive Behavioral Treatments for Patients with Classical, Secondary, and Idiopathic Trigeminal Neuralgia

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SYSTEMATIC LITERATURE REVIEW OF COGNITIVE BEHAVIORAL
TREATMENTS FOR PATIENTS WITH CLASSICAL, SECONDARY, AND
IDIOPATHIC TRIGEMINAL NEURALGIA

by

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ABSTRACT

Trigeminal neuralgia is a painful neuralgia with a complicated pathology that is not clearly understood. Due to the ambiguity of the condition, patients often have to search for medical providers that specialize in trigeminal neuralgia, and even with the guidance of a specialist, some patients do not respond well to treatment.¹ Despite the uncertainty surrounding the specifics of the disease, there are treatments available that can provide some level of pain relief for patients suffering from this disorder. When a patient does not respond well to medical therapy, surgery can be the next appropriate step in patient care management.² However, while surgery can provide significant pain relief for patients who qualify, non-surgical treatments are needed during the interim, in the event of relapse, or for individuals who do not qualify for surgery. Cognitive behavioral therapy (CBT) is a well-researched treatment for chronic pain resulting from various diseases and disabilities.³ A systematic literature review was performed to identify if CBT decreases pain and improves the quality of life for patients diagnosed with classical, secondary, or idiopathic trigeminal neuralgia. More research is needed, but there is promising evidence in the literature that cognitive behavioral therapy can be useful for patients with trigeminal neuralgia to help them cope with their pain. In addition, there may be evidence that, while somewhat effective alone, cognitive behavioral therapy may be more effective in conjunction with another treatment such as medication. These results are encouraging for patients suffering with the chronic pain of trigeminal neuralgia, and future studies should further investigate the benefits of cognitive behavioral therapy for patients with trigeminal neuralgia.

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INTRODUCTION

Every day millions of people around the world suffer from chronic pain, and while there are many types a musculoskeletal pain, neuropathies, and neuralgias, neuralgia of the trigeminal nerve in the face has been described as one of the worst pains a human can experience.⁴

Paroxysms of searing pain from previously innocuous stimuli afflict a person with trigeminal neuralgia for years as they search for a way to relieve their pain. Depending on the patient, effective treatment can be difficult to find. Unfortunately, when the psychological impact of pain every time a person eats, brushes their teeth, or smiles at a friend becomes too great, some feel there is no other option and ultimately take their own life.¹

Cognitive behavioral therapy is currently being successfully used to treat other types of chronic pain by reshaping thought patterns and behaviors to healthy and helpful patterns that reduce psychological stress and increase a person's ability to handle their pain.³ The question then arises, is cognitive behavioral therapy a useful, effective treatment for trigeminal neuralgia? By conducting a systematic literature review, the known works concerning cognitive behavioral therapy and trigeminal neuralgia were able to be identified and examined, and, while not robust, the research regarding cognitive behavioral therapy for trigeminal neuralgia is promising. This promising result provides support for the continued investigation of CBT for trigeminal neuralgia and should encourage more research to be conducted with this type of intervention.

BACKGROUND AND SIGNIFICANCE

Trigeminal neuralgia, or *tic douloureux*, as it is also known by, is a neuropathic syndrome of the trigeminal nerve that results in painful paroxysms of pain in the face along one or more branches of the trigeminal nerve.⁵ The trigeminal nerve is the fifth cranial nerve and provides the sensory and motor function for the face via its three branches, the mandibular, maxillary, and ophthalmic.⁵ The term neuralgia describes a burning or stabbing pain along a nerve,⁶ and neuralgia occurs when nerves are compressed or damaged and can occur in multiple nerves simultaneously.⁷ Understanding of the pathology of some of the diseases of the trigeminal nerve is limited. Therefore the term 'neuralgia' is used to distinguish trigeminal neuralgia from other similar diseases of the trigeminal nerve based on the specific clinical presentation and treatments of trigeminal neuralgia.⁸

According to the 3rd edition of the International Classification of Headache Disorders, trigeminal neuralgia is diagnosed when paroxysmal pain continues, the pain is exclusively present in one or more divisions of the trigeminal nerve, and is triggered by normally harmless stimuli.⁸ The paroxysms of severe, piercing, or electric-like pain have a duration of varied time frames up to two minutes. If the patient presents with all of the previous symptoms, and no other ICHD-3 disease can explain these symptoms better, trigeminal neuralgia can be diagnosed.⁸

Trigeminal neuralgia is divided into three different subcategories based on the cause of the nerve pathology.⁸ Trigeminal neuralgia occurring exclusively from the effects of compression on the nerve is termed classical trigeminal neuralgia.⁸ The most common cause of classical trigeminal neuralgia is compression of the nerve by a blood vessel, usually an artery.²

Even though the pain stems from the compression of the nerve and is technically secondary to the compression, it is separate from secondary trigeminal neuralgia due to differences in pathology and treatment options of the trigeminal nerve.⁸ Magnetic Resonance Imaging (MRI) or surgical evidence of compression with a morphological change of the nerve root is required for a diagnosis of classical trigeminal neuralgia.⁸

Classical trigeminal neuralgia can be further subdivided into purely paroxysmal and classical trigeminal neuralgia with concomitant continuous pain (previously termed trigeminal neuralgia type 2). Paroxysms – sudden attacks of pain - are present in both types; however, constant or almost constant pain is also present in trigeminal neuralgia with concomitant pain. This background pain may be the result of central sensitization.⁸

Trigeminal neuralgia that occurs as a result of a disease that is known to be able to cause trigeminal neuralgia is termed secondary trigeminal neuralgia.⁸ Pain in secondary trigeminal neuralgia can also be either purely paroxysmal or concomitant continuous. The neuralgia can develop as a result of multiple sclerosis, arteriovenous malformation, or the development of a tumor in the cerebellopontine angle.⁸

If a patient presents with the symptoms of trigeminal neuralgia and there is no apparent physical reason as to the cause of the neuralgia – or when there is a neurovascular contact that does not cause morphological changes in the nerve⁹ – the patient can be diagnosed with idiopathic trigeminal neuralgia⁸. Idiopathic trigeminal neuralgia can be diagnosed by a patient's pain history and through examination during an interview.¹⁰ Pain experienced with idiopathic trigeminal neuralgia can also be paroxysmal or concomitant⁸.

Another neuralgia listed in the same category of the 3rd edition of the International Classification of Headache Disorders as trigeminal neuralgia, occipital neuralgia presents and is treated similarly to trigeminal neuralgia. Thus, I, with guidance from my committee, decided that data found concerning cognitive behavioral treatment of occipital neuralgia could support data for CBT treatment of trigeminal neuralgia.

Occipital neuralgia, also known as C2 neuralgia,⁷ is a neuralgia in the same category in the third edition of the International Classification of Headache Disorders as trigeminal neuralgia. There are three occipital nerves innervating the back of the scalp, the greater occipital nerve, the lesser occipital nerve, and the third occipital nerve.⁸ Patients afflicted with occipital neuralgia experience pain in the posterior scalp, as well as sometimes in the fronto-orbital area due to the spinal trigeminal nucleus.⁸ The pain can either be bilateral or unilateral, but is usually unilateral.⁷ In addition, it is paroxysmal, severe, and is described as shooting or stabbing, and when the scalp or hair is touched, the patient experiences allodynia, dysesthesia, or both.⁸ The path of the nerve branch(es) affected may also be tender to the touch, and the patient may have trigger points on the greater occipital nerve or C2 nerve.⁸

Occipital neuralgia is diagnosed by physical examination, imaging such as MRI, and by administering a temporary local anesthetic nerve block into the affected nerve(s). However, the nerve block cannot be used as the only method of diagnosis because other headache disorders are also temporarily relieved by a nerve block.⁷ In the majority of cases, compression of the greater occipital nerve is implicated as the cause of occipital neuralgia,⁷ as the greater occipital nerve is a long nerve that travels along the neck, and is thus at high risk for compression in such a

flexible part of the body.¹¹ Compression or irritation of the occipital nerves can also be caused by a variety of vascular, neurogenic, or osteogenic causes. These include - but are not limited to - irritation from muscles being constantly contracted, compression from an artery, multiple sclerosis, and abnormalities or injuries of the cervical vertebrae.⁷

Once diagnosed, typical treatment of occipital neuralgia is approached in much the same way as the treatment of trigeminal neuralgia. Many patients find relief from pharmacological therapy, physical therapy, and other non-invasive procedures such as injections and pulsed radiofrequency.¹¹ In severe cases that do not respond well to more conservative treatment, surgery may be required. However, the decision to proceed with surgery must be cautiously thought out, as there is a risk of other painful conditions besides occipital neuralgia arising as a result of surgery.⁷

Both occipital neuralgia and trigeminal neuralgia are most often caused by compression of the nerve or can appear as the result of another disease such as multiple sclerosis. In addition, trigeminal and occipital neuralgia produce the same severe paroxysmal pain in afflicted patients, as well as sensitivity to generally non-painful stimuli. Treatment of both diseases is also similar. Both have been shown to respond to some of the same non-invasive treatment options such as antiepileptics, pulsed radiofrequency, Botulinum Toxin-A, and some of the same surgical procedures as well. Due to these similarities, I, with guidance from my committee, decided that data concerning the treatment of occipital neuralgia with cognitive behavioral therapy should also be gathered in this literature review to support literature regarding cognitive behavioral treatment of trigeminal neuralgia.

Symptoms of trigeminal neuralgia

Statistically, trigeminal neuralgia is more common in older women; however, men and younger individuals of both sexes can develop the condition.² Patients most often present with pain in the maxillary and mandibular nerve branches, with <5% reporting pain in the ophthalmic branch.⁵ Classical trigeminal neuralgia is almost exclusively restricted to one side of the face, with bilateral pain more common in patients with secondary trigeminal neuralgia.² Daily activities and sensations that are largely ignored by patients without trigeminal neuralgia, such as eating or a cold breeze, can stimulate pain for those suffering from the disease.⁵

Typically patients do not present with noticeable sensory alterations in the trigeminal nerve – with the exception of patients with secondary trigeminal neuralgia - except for the triggers causing the pain.⁸ Symptoms may change over time, with paroxysms occurring closer together with less pain-free time between.⁴ In contrast, sometimes patients experience total remission from their symptoms for a time, with some living pain-free for years.²

Dental care can also prove challenging for patients with trigeminal neuralgia, as before diagnosis, patients may perceive the pain in the teeth from the mandibular branch of the trigeminal nerve⁵ and seek dental care as treatment. Often the patient will go through unnecessary procedures in an attempt to relieve the pain. Even after diagnosis, patients may not fully understand that, while they feel pain in their mouth or teeth, the pain did not originate in the mouth or teeth.¹² A 49-year-old man in a case report in General Dentistry who visited the Louisiana State University Health Science Center School of Dentistry was diagnosed with trigeminal neuralgia after dental procedures failed to relieve the pain. When he doubted the

diagnosis, he again insisted his teeth were the cause of his pain and went so far as to seek out another dentist who would pull the healthy tooth he believed was causing his pain.¹²

Mechanisms of trigeminal neuralgia

Although the exact pathophysiology of trigeminal neuralgia is still not completely understood,⁴ some theories do exist on what causes the pain experienced by afflicted patients^{4,13,14}. Research concerning the pathophysiology of the disorder comes exclusively from observations of patients that are affected by it, as suitable animal models to simulate the symptoms of trigeminal neuralgia do not exist.⁴

Trigeminal neuralgia symptoms are thought to be caused most often by mechanical injury to the nerve. Specifically, the injury occurs in a 4 to 5 mm zone that extends from the point where oligodendrocytes of the central nervous system give way to Schwann cells and the nerve's entry point in the pons. When an artery compresses the nerve in this zone, it can demyelinate and damage the nerve, causing pain during previously pain-free activities.¹³ Even without damage to the axons of the nerve, demyelination alone has been suggested by diffusor tensor imaging to influence trigeminal neuralgia pathogenesis.¹⁴ Neurovascular decompression may also cause atrophy of the nerve, which can increase the likelihood a damaged nerve will become symptomatic.⁴

The ignition hypothesis stems from knowledge about the activity of damaged sensory neurons and observations of patients who have undergone microvascular decompression.¹⁴ Post-injury, some neurons may fire randomly. Others fire in response to stimuli, but the threshold for

an action potential is far lower than a healthy neuron, resulting in several seconds of firing, termed afterdischarge. Afterdischarge can spread to nearby neurons and elicit action potentials from those neurons as well.⁴ This afterdischarge is a potential explanation of the characteristic paroxysms patients experience.^{4,14} Injury to the root or ganglion of the nerve, specifically the afferent axons, can make the axons more easily excited, creating paroxysms of pain.¹⁴ Ephaptic crosstalk between neurons sensitive to light touch and neurons that carry nociceptive information may also be responsible for the hypersensitivity to innocuous stimuli typical in trigeminal neuralgia.⁴

Another theory is the trigeminal convergence-projection theory. This theory proposes that as nociceptors in the head and face feed information to the spinal trigeminal nucleus, naturally neurotransmitters and other substances are released that decrease the threshold of second-order neurons nearby. These second-order neurons may fire from inappropriate signals, transmitting to the somatosensory cortex as pain.¹⁴ The bioresonance hypothesis states that when a structure near the trigeminal nerve vibrates in a frequency close to the natural frequency of the nerve, the nerve can be damaged. The damaged trigeminal nerve can then malfunction and produce sensations of pain.¹⁴

Studies of the brains of patients affected by trigeminal neuralgia also show abnormalities that may contribute to the disorder. Painful and non-painful stimulation of the trigeminal nerve has been shown to involve many brain structures, such as the thalamus, insula, and premotor/motor cortex, that may suggest that the brains of trigeminal neuralgia patients are hypersensitive to nociceptive information from the trigeminal nerve.¹⁴ Grey matter reduction in

the anterior cingulate cortex, parahippocampus, and temporal lobe also suggests that patients' brains adapt physically to chronic pain from trigeminal neuralgia.¹⁴

Quality of Life for Those Afflicted with Trigeminal Neuralgia

Chronic orofacial pain has been shown to impact a patient's ability to live a normal life, as well as affecting sleep, quality of life, and family members of the patient.¹⁵ Trigeminal neuralgia, specifically, has been described as one of the most excruciating pains that can afflict a person.⁴ Patients afflicted with this disease have an increased risk of depression and anxiety, and depression has been correlated with an increase in pain levels. The psychological suffering for patients can become so great that they go so far as to attempt suicide.¹

Trigeminal neuralgia can be confused with other disorders that produce similar side effects, and delayed diagnosis causes patients to suffer without proper treatment.¹ Patients are often forced to search for answers for their unusual pain, and even when a diagnosis is given, medical providers who are not specialists in treating trigeminal neuralgia may prescribe ineffective medications that will not treat a patients' symptoms.¹ Even medications that do relieve trigeminal neuralgia symptoms, while effective, can also cause significant side effects that may require the patient to stop taking medications. When medications are not effective or not tolerated, surgery is the next logical option but not all patients are candidates for surgical procedures.¹

Treating Chronic Pain with Cognitive Behavioral Therapy

Chronic pain is a multidisciplinary topic, influenced by many interacting biological, social, and psychological factors, thus requiring multidisciplinary treatment that goes beyond treating the biological basis of an individual's pain. Cognitive behavioral therapy (CBT) is a frequently-used treatment method for chronic pain.¹⁶ There are institutions with programs developed specifically to relieve chronic pain through multidisciplinary treatment that includes cognitive behavioral therapy. Two such programs are the Mayo Clinic's Pain Rehabilitation Center¹⁷ and the Cleveland Clinic's Center for Neurological Restoration, which offers treatment for neurological and chronic pain disorders, including trigeminal neuralgia¹⁸. There is no specific structure for how cognitive behavioral therapy is administered but it has been shown to be effective in special populations such as children and the elderly.³

As opposed to pharmacological therapies or surgeries, which attempt to correct or influence the physical cause of the pain, patients treated with cognitive behavioral therapy are given strategies to manage their pain, reducing the psychological side effects that come with, and often aggravate, chronic pain.¹⁶ Patients are taught how to change their thought patterns to decrease catastrophizing thoughts and increased patients' perceived ability to handle their pain.³ Patients are also guided in learning new ways to plan their daily activities to reduce pain, utilize relaxation techniques, and develop healthier sleeping patterns.¹⁶

The foundation for using cognitive behavioral therapy to treat chronic pain is the Gate Control Theory of Pain, which theorizes that neurotransmitters involved in pain are affected by areas of the brain that control thought, emotions, and regulatory processes. However, there is

MRI evidence to suggest that when a patient uses the techniques of cognitive behavioral therapy, the prefrontal cortex may change structurally to release neurotransmitters to prevent pain impulses traveling in the spinal cord from being received by the brain.¹⁶ Results of a randomized controlled trial¹⁹ comparing patients (n = 19) who received cognitive behavioral therapy to a control group that received educational materials showed that the brains of the CBT-treated patients underwent structural changes that the brains of the control did not, and the CBT-treated patients experienced less pain and felt more able to cope with their pain at the end of the study than the control.¹⁹

Due to the amount of evidence from decades of study that cognitive behavioral therapy is an effective treatment option for chronic pain, it is often the first psychological pain therapy a patient will receive. New delivery methods for cognitive behavioral therapy are being explored, such as over the phone or the internet, making it an even more practical and accessible method of treatment.³

METHODS

A systematic literature review was chosen as the method of research for this thesis due to the ability of a systematic review to identify all of the known information about a given topic. A preliminary review revealed that, while there was data to be found on treating trigeminal neuralgia with cognitive behavioral methods, there was no existing literature review on the subject. There is a wide range of treatment options available for patients with trigeminal neuralgia, cognitive behavioral therapy being one of them.

A well-structured systematic literature review appeared to be the most effective way to identify the existing literature on treating trigeminal neuralgia with cognitive behavioral therapy. The goal of this systematic review is to identify all the known data and provide insight into the effectiveness of cognitive behavioral therapy as a treatment for trigeminal neuralgia. A secondary goal of the review is to identify whether more research is needed in this area.

Databases, Search Terms, Inclusion and Exclusion Criteria

A systematic literature review was conducted to identify the existing literature concerning cognitive behavioral treatment of trigeminal neuralgia. The following databases were searched: Pubmed Central, Neurosciences Abstracts, and PsychInfo (which included MEDLINE, Social Work Abstracts, APA PsycInfo, APA PsycArticles, and the Cochrane Database of Systematic Reviews).

The search terms used were carefully chosen to incorporate synonyms, acronyms, and variations on spelling, while excluding unrelated disorders. In addition to searching for data

about trigeminal neuralgia, we also thought it appropriate to search for cognitive behavioral treatment of occipital neuralgia as well. Occipital neuralgia is in the same category as trigeminal neuralgia in the International Classification of Headache Disorders, and the two neuralgias are similar enough that we felt results found for occipital neuralgia would be able to add to the literature about trigeminal neuralgia. Listed below are the search terms used when conducting searches:

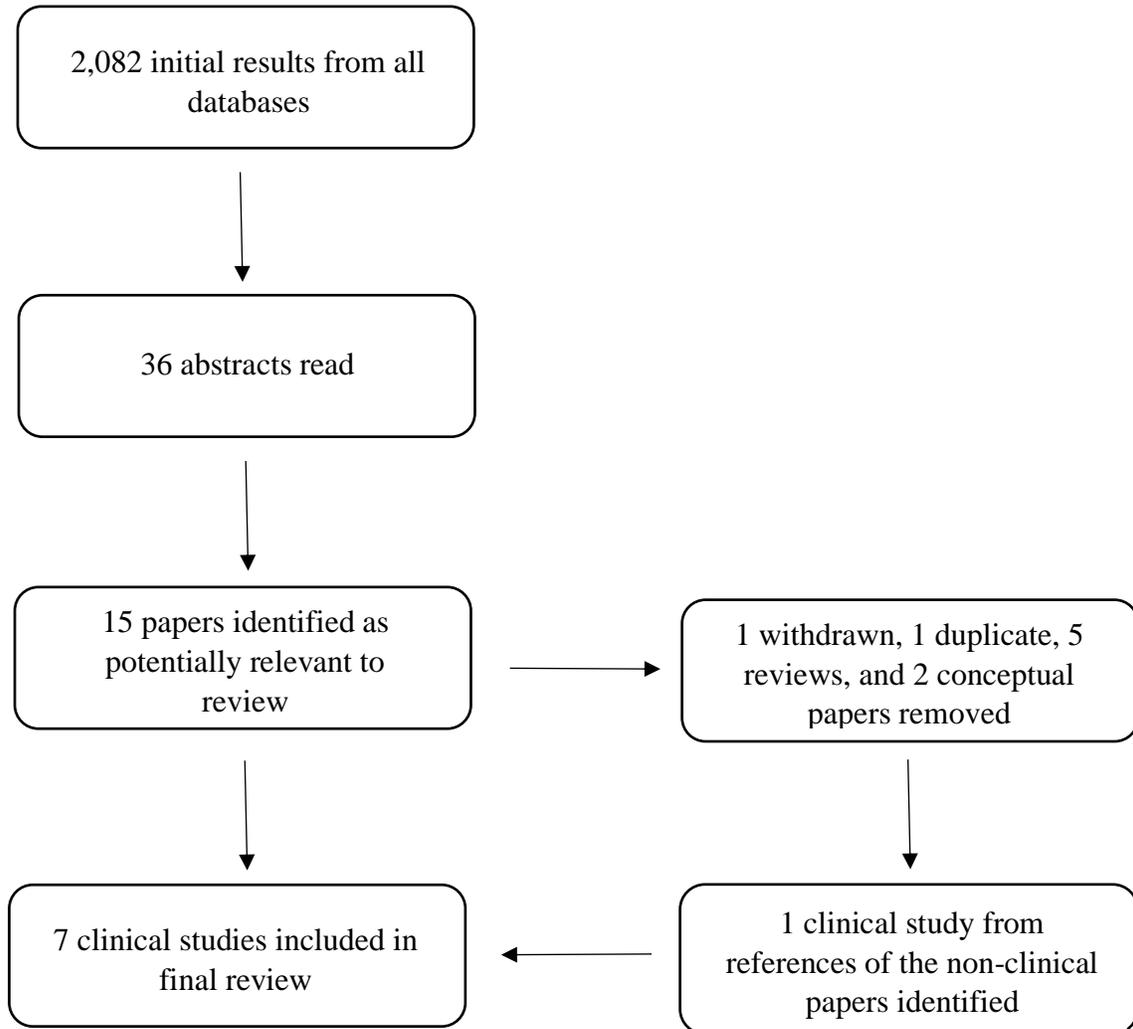
Trigeminal neuralgia OR occipital neuralgia OR neurogenic pain OR neuralgia OR orofacial pain AND cognitive behavioral therapy OR cbt OR cognitive behavioural therapy OR psychotherapy NOT back pain OR knee pain OR cancer OR insomnia OR dementia

I specified that my searches did not include back pain, knee pain, cancer, insomnia, or dementia so as to consolidate the information concerning cognitive behavioral treatments of trigeminal neuralgia. When conducting my searches, I limited my scope to literature published within the last ten years. When the database had an option to automatically restrict the searches to ten years, I selected that option, and when the database required a specific date range, I limited the searches to January 1, 2010, through February 10, 2020 (when my search terms were finalized). In addition to narrowing the time frame for my literature review, I excluded literature in a language other than English. The types of studies included were randomized controlled trials, quasi-experimental designs, uncontrolled studies, literature reviews, quantitative studies, cohort studies, and case studies. Conceptual descriptive papers were excluded.

RESULTS

Between all of the databases previously outlined for this study, 2,094 results were obtained. Twelve duplicates were eliminated, for a total of 2,082 results. The titles of the 2,082 results were hand-searched and abstracts of papers were read if the paper appeared to address cognitive behavioral treatment of trigeminal neuralgia or orofacial pain in general. From the 36 abstracts, 15 full-text papers were read. Two papers were removed immediately as one had been withdrawn, and the other was a duplicate of the withdrawn paper. Two papers were identified as conceptual papers and 5 were literature reviews that were removed while the references were searched. The remaining 6 clinical studies consisted of 1 randomized-controlled trial, 1 quasi-experimental study, 1 prospective study, 1 retrospective study, 1 qualitative study, and 1 case series. All six clinical studies were included in the review. Hand-searching the 5 reviews and 2 conceptual papers added 1 more retrospective study for a total of 7 clinical studies included in this review (see Table 1 in Appendix A: Extraction Table).

Figure: Summary of systematic search process.



Source: Created by author.

Themes

Three main themes were identified from the 7 clinical studies evaluated: cognitive behavioral therapy as a coping mechanism, cognitive behavioral therapy alone as an intervention for trigeminal neuralgia, and cognitive behavioral therapy combined with one or more other treatments. Overall, it appears that some patients find success with cognitive behavioral therapy, but there are conflicting evidence on the results on using CBT alone as the only intervention. Instead, cognitive behavioral therapy may be more consistently effective when used to relieve the psychological burden of pain while in combination with one or more other treatments.

CBT as a Coping Mechanism

Cognitive behavioral therapy for trigeminal neuralgia appears to be beneficial to patients as a way to cope with the psychological side effects of their chronic facial pain, rather than as a method of reducing the level of physical pain felt.²⁰⁻²² Cognitive behavioral therapy gave patients with idiopathic facial pain a sense that their pain was legitimate and helped them feel understood by the medical community when they had previously been shuttled from provider to provider with no answers. Having a treatment for their idiopathic facial pain also helped them identify with the community of people who suffer from chronic orofacial pain and realize they were not alone. Family support is important for patients with chronic orofacial pain, and having a formal treatment for their idiopathic pain gave patients a way to show their families that their condition was a serious issue.²⁰

Coping with the consequences of a long-term orofacial injury or disease such as trigeminal neuralgia is difficult for patients, and cognitive behavioral therapy appears to help

patients come to terms with their chronic illness or injury and live their lives as normal as possible.^{20,21} Cognitive behavioral therapy gave patients a way to assess and understand their pain using mindfulness techniques. Journaling and tracking the cyclic nature of their pain gave them a sense of control over their pain and a way to identify when pain levels were decreasing.²⁰

Sometimes, for patients whose main barrier to recovery was accepting their pain, cognitive behavioral therapy and counseling by a specialist were sufficient for the patient to cope with their pain, and the patient did not require any additional pharmacological or surgical interventions.²¹

CBT Alone as an Intervention

Cognitive behavioral therapy is being studied as a single treatment method for trigeminal neuralgia and orofacial pain, but the results are not unanimous. Cognitive behavioral therapy to accept and cope with their pain may be all that is needed when patients are having difficulty coming to terms with their chronic illness.²¹

A method that appears to be effective for coping with altered sensations of the trigeminal nerve is sensory retraining. Sensory retraining is a cognitive behaviorally based treatment method normally used to rehabilitate altered sensations in other parts of the body, such as the hands. Sensory retraining teaches patients to mindfully interpret stimuli to the affected area through daily exercises; in this case, the region of the face affected by the damaged nerve. Sensory retraining can give patients with altered sensations from the trigeminal nerve a way to process what they are feeling, allowing them to ignore the pain signals and focus on weaker signals from the damaged nerve that otherwise would be overshadowed by the pain.²²

However, there is evidence that not all patients who seek out cognitive behavioral therapy alone find the treatment effective. It is not clear whether these patients who did not find cognitive behavioral therapy effective sought therapy from a chronic pain or chronic orofacial pain specialist, but regardless cognitive behavioral therapy did not succeed as a treatment for these individuals²³. When cognitive behavioral therapy was offered with the possibility of adding another treatment method to the patient's plan of care, only a small number of patients were treated exclusively with cognitive behavioral therapy.²¹

CBT in Combination with Other Treatment Methods

Cognitive behavioral therapy as a treatment method for trigeminal neuralgia and other types of orofacial pain was usually combined with another treatment intervention. When used alone, cognitive behavioral therapy was not found to be successful in all cases. In some cases a patient could be treated with cognitive behavioral therapy alone.²¹ When combined with one or more different treatments, cognitive behavioral therapy seemed to have a higher success rate. Cognitive behavioral therapy was found to be beneficial in conjunction with medication or splint therapy for those who were suffering from a long history of chronic pain.²⁴ CBT was also administered in conjunction with lidocaine patches and possibly surgery to improve patients' coping strategies and appeared to be helpful.²¹

Psychological therapy was also a factor in successful multidisciplinary treatment programs for trigeminal neuralgia.^{25,26} These multidisciplinary treatment programs are highly structured and utilize medical and non-medical management, including psychological therapy, to treat trigeminal neuralgia. While the impact of cognitive behavioral therapy in these programs

was not directly measured, psychological support was viewed as helpful for patients,²⁶ and trigeminal neuralgia patients enrolled in these structured programs generally had a successful reduction of their burden of pain by at least 50%.^{25,26}

Discussion

There appears to be evidence that CBT is effective for patients with trigeminal neuralgia, but it seems that the intervention is most effective when combined with other forms of treatment, such as medication or when given in a context of a multidisciplinary management program. A review of pediatric management of chronic orofacial pain associated with a disease (COFPAD) corroborated this finding and concluded that psychological therapy was an essential part of a complete treatment program for children with COFPAD.²⁷

While there likely is not enough evidence from the seven studies included in this review alone to definitively conclude that cognitive behavioral therapy is an effective treatment for trigeminal neuralgia, I believe these results are promising and further research would be beneficial. Cognitive behavioral therapy does not aim to directly address the physical pain of trigeminal neuralgia, but instead changes the way patients think about and perceive their pain.²⁰ By developing healthy coping mechanisms, patients can gain control and understanding of their pain and move towards a normal life with a decreased burden of pain.²⁰⁻²² A 6-month follow-up study investigated whether patients' perceptions of their chronic orofacial pain could be used to predict pain-related disability. The study concluded that believing chronic orofacial pain had serious implications in a patient's life was a strong positive predictor of treatment outcomes. In

addition, feelings of low personal control over the pain and the chronic nature of the pain were positive predictors of higher depression scores in patients.²⁸

Other reviews of the literature examining cognitive behavioral therapy for orofacial pain in general also found that it was beneficial for the patient.^{29,30} When chronic facial pain is interpreted as intimidating or incapacitating, the psychological stress associated with the patient's pain increases. Cognitive behavioral therapy techniques such as relaxation, developing healthy coping mechanisms, and evaluating the pain help reduce this psychological stress and allow patients to see long-term improvement.²⁹ Chronic facial pain is dynamic with many factors interacting with each other. Proper psychological treatment can aid in the patient's efforts to adapt to their pain,²⁹ and lead to informed choices about which treatment plan is best for them.³⁰

More studies are needed that investigate treating trigeminal neuralgia or similar neuropathic orofacial pain disorders with cognitive behavioral therapy alone. Cognitive behavioral therapy has been extensively studied for temporomandibular disorders, but there are far fewer data and studies of the effectiveness on cognitive behavioral therapy for trigeminal neuralgia.³¹ Trigeminal neuralgia is often underrepresented in studies in the category of chronic orofacial pain disorders. Studies that use orofacial pain as a broad category usually include a large number of temporomandibular cases and a small amount of neuropathic facial pain disorders.

In addition, studies that include cognitive behavioral therapy or similar psychotherapy for trigeminal neuralgia should collect more data about the number of treatment sessions needed and

expand more on the impact psychotherapy has for these patients. Only two of the studies reviewed reported the number of sessions given to their patients. One study provided three sessions as a structured plan,²² and the second study offered patients up to eight sessions, with a mean number of sessions attended by patients being 5.6.²⁰ This is important because knowing how many sessions are required for optimal effectiveness will help medical professionals to determine the standard amount of sessions into treatment plans.

Another important note is the patient demographics across these studies (see Table 2 in Appendix B). Every study that reported patient genders and ages reported that women in their 40's-50's were the most common patient being treated. This can be attributed to the disease, as trigeminal neuralgia is most prevalent in older women.² In addition, a majority of the patients evaluated in these studies had or were being treated at a specialty clinic for their orofacial pain. Therefore, these studies may not have reached groups of patients who have trigeminal neuralgia but were not part of a specialty clinic. Diversifying the patient demographics and pulling patients from various settings would give insight into whether cognitive behavioral therapy is useful for anyone with trigeminal neuralgia, or to only a select group of patient populations.

While cognitive behavioral therapy is clearly being included in studies evaluating the impacts of multiple treatments for trigeminal neuralgia and other orofacial pain, cognitive behavioral therapy seems to be considered almost as an afterthought in these studies. While considered helpful in several studies, cognitive behavioral therapy is either not measured directly,²⁶ the specifics of the treatment are not reported in the study,²⁴ or cognitive behavioral therapy is a recent addition to a program, and the study did not describe the mean number of

sessions administered or detailed data of whether patients' mental health scores changed as a result of CBT to determine how helpful the treatment was.²¹ The complexity of cases should also be evaluated, as this has been revealed by another review to be a useful determinant in deciding a patient's course of treatment, yet lacking in the data.³⁰

CONCLUSION

The pain of trigeminal neuralgia can be extremely difficult to live with, increasing depression, anxiety, and can ultimately lead people to consider and attempt suicide.¹ For some patients, surgery is an option, but non-surgical interventions may be the only option for patients who do not qualify for surgery¹ or do not want to risk the serious side effects of surgery.^{32,33} Occipital neuralgia also presents and is treated similarly to trigeminal neuralgia, and treatments for both diseases overlap.

It has been shown that patients who suffer from chronic pain often present with depression, anxiety, and disturbed sleep that further aggravate their pain.³ Over the decades cognitive behavioral therapy has proven an effective method of treatment for chronic pain³ and may even alter brain structure and promote the release of pain-relieving neurotransmitters.¹⁶ Cognitive behavioral therapy can be administered in a variety of methods by psychologists and CBT techniques can be incorporated into patient care by other trained medical professionals such as nurses and dental hygienists,³ without the difficult side effects of medications or the potentially life-altering reality of surgery.

The current literature on using cognitive behavioral therapy to treat trigeminal neuralgia is promising. However, more research is needed, and studies investigating multiple treatment methods for trigeminal neuralgia or chronic orofacial pain as a generalized category should expand their investigation of cognitive behavioral therapy to include more data on the exact methods used and the impact it had on patient outcomes. Cognitive behavioral therapy gives

patients with trigeminal neuralgia a way to effectively cope with their pain and live as normal lives as possible.²⁰⁻²²

Coming to terms with the consequences of long-term trigeminal nerve pain is difficult for patients, and cognitive behavioral therapy can help them overcome that barrier and accept their condition.²¹ There is some evidence that psychological therapy is the main treatment required for some patients with trigeminal neuralgia and other chronic orofacial pains.^{21,22} However, success seems to be more consistent when paired with another treatment method such as medication^{21,24} or as part of a structured multidisciplinary management program.^{25,26}

Overall, given the low risk, ease of administration, and potential psychological and physical benefits of cognitive behavioral therapy, with further research, it may prove to be a useful treatment for trigeminal neuralgia. Incorporating cognitive behavioral therapy into the treatment of patients with trigeminal neuralgia could be another step forward to providing these patients with much needed psychological relief and confidence that they can live their lives without being controlled by their pain.

APPENDIX A: EXTRACTION TABLE

Table 1: Summary of clinical studies identified in systematic literature review.

| Author | Year | Study Type | Methodology | Interventions | Outcome Measures | Comments | Conclusion |
|-------------------------------|------|--------------------------------------|--|--|--|---|--|
| Goldthorp e, J, et al. | 2016 | Qualitative Study | Thematic analysis of interviews with patients conducted two weeks after the end of the intervention (n = 14) | A guided self-management program and patients could participate in up to 8 CBT sessions | A custom, structured interview post-treatment to determine patient acceptability of intervention | All orofacial pain was idiopathic. All patients had been referred to secondary outpatient clinics. | CBT for chronic orofacial pain is acceptable to patients. |
| Heinskou, T, et al. | 2019 | Two-year prospective real-life study | An observational, prospective study conducted over 2 years (n = 186) | Pts were seen 5 times over 2 yrs for assessments and to ensure treatment plan was sufficient, evaluate medical management and whether surgery was needed. Also offered support by a trained nurse, psychologist, physiotherapist throughout the 2 yrs. | Burden of pain on Numerical Rating Scale (NRS) and Barrow Neurological Institute (BNI) scale. Patients given a 21-question survey given at the end of the 2 years. | Support by a trained psychologist was offered, but data about the sessions or patients who took advantage of them was not gathered. | The multidisciplinary approach was effective in reducing burden of pain, and the authors believed non-medical management such as psychotherapy aided in the positive outcomes of patients. |
| Nguyen, T, et al. | 2014 | Quasi-experimental | Evaluating pain levels before and after 4 weeks of treatment (n = N/A) | Psychotherapy, Ganglion pterygopalatin um blockade, pyshiotherapy, TENS, Phytotherapy, cupping, acupressure, acupuncture | Change in patient pain level (no specific scale reported). | Study may not be of the highest quality. | Multidisciplinary approach that included psychotherapy for medically resistant trigeminal neuralgia was very successful |

| Author | Year | Study Type | Methodology | Interventions | Outcome Measures | Comments | Conclusion |
|----------------------------|------|-----------------------------------|--|---|--|--|---|
| Phillips, C, et al. | 2011 | RCT | Multi-center double-blind, parallel two-arm stratified block RTC (n = 191) | CBT-based sensory retraining was taught post surgically in 3 sessions over 3 months along with normal opening exercises and compared to patients with only opening exercises | Patient-reported burden of altered sensation, two-point perception, two-point discrimination, and contact detection thresholds | | While RTC focuses on impact of sensory retraining on acute injury, all different types of injury to the trigeminal nerve and how all injuries produce altered sensations. |
| Renton, T, et al. | 2012 | Case series and literature review | Patients with post-traumatic injuries to a branch of the trigeminal nerve enrolled in a multidisciplinary pain clinic were evaluated (n = 216) | Counseling offered as part of program and (if indicated for patient), CBT alone (11), with surgery (2), with medication (1), with topical 5% lidocaine patches (1), with surgery and lidocaine (1), with medication and lidocaine (1) | Size and extent of neuropathic area, subjective function, mechano-sensory function, functional problems and pain profile (pain on a scale of 0-10); PainDETECT questionnaire | 114 patients offered counseling, reassurance, CBT alone or in combo with another treatment, was offered to 17 patients (timelines not specified) | Painful post-traumatic trigeminal neuropathy can coexist with trigeminal neuralgia if the trigeminal neuralgia continues after the injury. |

| Author | Year | Study Type | Methodology | Interventions | Outcome Measures | Comments | Conclusion |
|-------------------------------|------|---------------------------|--|---|--|--|--|
| Tomoyaso, Y, et al. | 2014 | Retrospective study | Retrospective study over 12 years (n = 221) | Psychotherapy with pharmacotherapy and/or splint therapy and/or nerve block or similar treatment and/or dental treatment and/or physiotherapy. (No timeline of treatment given) | Rate of remission or significant improvement based on clinical data categorized into 4 levels: remission, significant improvement, partial response, and no response. | | Psychotherapy was included in the treatment plan, and 65.7% of patients saw substantial results. |
| Beecroft, E. V, et al. | 2013 | Retrospective examination | Retrospective examination of COFP referred to oral and maxillofacial surgery (n = 101) | CBT alone | Outcome assessed on a custom, 4-level scale from “Symptoms unchanged” – “Symptoms completely resolved”. Data on patient treatment history through different care settings and from different specialists that was available from hospital notes and correspondence | Cohort included six different orofacial pain disorders, including trigeminal neuralgia (4%). | The 101 patients made 332 treatment attempts. Three attempts at using CBT to manage pain were found, and none of the attempts were successful. |

Source: Created by the author.

APPENDIX B: PATIENT DEMOGRAPHICS

Table 2: Patient demographics

| Study | n | Mean Age | Age Range | Gender | Comments |
|-------------------------------|---------------|---|---|---------------------------|--|
| Goldthorpe, J, et al. | 14 | 50 years | 21-72 years | Female = 13 Male = 1 | |
| Heinskou, T, et al. | 186 | 59.5 years | 54.3-65.8 years | Female = 100 Male = 86 | |
| Nguyen, T, et al. | Not specified | Not specified | Not specified | Not specified | This was a publication of a presentation and did not include these details. |
| Phillips, C, et al. | 191 | Not specified | Not specified | Not specified | Patients were described as mostly young and healthy, but no other demographics given. |
| Renton, T, et al. | 216 | Alveolar nerve injuries = 44.0 years Lingual nerve injuries = 38.4 years | Alveolar nerve injuries = 22-85 years Lingual nerve injuries = 20-64 years | Not specified | The study broke patients up into two groups based on affected nerve and reported some demographics separately. |
| Tomoyaso, Y, et al. | 221 | 56.6 years | 16-89 years | Female = 169 Male = 52 | |
| Beecroft, E. V, et al. | 101 | 47 years | Not specified | Female = 75 Male = 26 | |

Source: created by author

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