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TO EVALUATE ROLE OF OMEGA-3 FATTY ACIDS AND METHYLCOBALAMIN IN MANAGEMENT OF TRIGEMINAL NEURALGIA

Dental Science

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ABSTRACT

BACKGROUND: Trigeminal neuralgia is a condition characterized by pain coming from the trigeminal nerve, which affects the face - most commonly one side of the jaw or cheek.In present article the potential benefits of omega -3 fatty acids and methylcobalamin in conjunct with carbamazepine is assessed.**OBJECTIVE:** The objective of the study was to evaluate the role of omega-3 fatty acids and methylcobalamin in the neuralgic pain along with carbamazepine in treating neuralgic pain. **MATERIAL AND METHODS:** The present study was conducted on 100 patients with TN pain in Patna medical college and hospital,bihar. The patients were divided in two groups. The group I consisted of 50 patients who were on carbamazepine only, and group II comprised of 50 patients who were on carbamazepine and omega-3 fatty acids and methylcobalamin. The pain was assessed using Brief Pain Inventory questionnaire, which is the most widely used questionnaire for chronic pain. The patients were evaluated on the day of reporting and on subsequent follow-up at 2 weeks, 6 weeks, and 14 weeks interval. The data obtained was subjected to statistical analysis to assess the additional benefits of omega-3 fatty acids and methylcobalamin in TN pain. **RESULTS:** The results obtained showed that the intensity of pain reduction was better in group II receiving carbamazepine and Omega 3 fatty acids and metylcobalamin as compared to the group I patients who were administered carbamazepine only. **CONCLUSION:** Present study signifies the use of omega -3 fatty acids and methylcobalamin in the treatment of trigeminal neuralgia but study on longer period and large intervals is needed further.

KEYWORDS

Trigeminal Neuralgia, Omega-3 Fatty Acids, Methylcobalamin, Neuralgic Pain.

INTRODUCTION

Trigeminal neuralgia (TN) is a problem with trigeminal nerve that causes severe facial pain. Trigeminal nerve is present on each side of our face. The nerves allow us to feel pain, touch, and temperature changes in different areas of our face.

According to the International classification of headache disorders, TN is defined as a disorder characterized by recurrent, unilateral, brief, electric shock-like pains, abrupt in onset and termination, limited to the distribution of one or more divisions of the trigeminal nerve, and triggered by innocuous stimuli.[2]

More recent estimates suggest the prevalence is approximately 1.5 cases per 10,000 population, with an incidence of approximately 15,000 cases per year. Higher prevalence of TN in women older than 40 years that usually affected the maxillary and mandibular branches[3]

Anticonvulsant drugs such as Carbamazepine is the gold standard. It treats the condition very well, but can have undesirable side effects such as drowsiness, unsteadiness, difficulty with coordination and memory, slurred speech and some difficulty with thinking or remembering.

Treatment of neuropathic pain, regardless of the source, can be challenging for the practitioner and frustrating to the patient. Use of prescription medication can provide relief but carries with it risks of side effects and dependency. A new study suggests that omega-3s may be an effective supplement for neuropathic pain, in addition to the other benefits of this fatty acid. [3]

Omega-3 fatty acids also known as n-3 fatty acids are polyunsaturated fatty acids mainly composed of docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA), and linolenic acid. The role of polyunsaturated fatty acid (PUFA) has gained role in the suppression of neuropathic pain and have gathered attention of various researchers. Omega 3 fatty acids are very effective in strengthening the cranial nerves such as trigeminal nerve[8]

Methylcobalamin (MeCbl), the activated form of vitamin B12, has been used to treat some nutritional diseases and other diseases in clinic, such as Alzheimer's disease and rheumatoid arthritis. As an auxiliary agent, it exerts neuronal protection by promoting regeneration of injured nerves and antagonizing glutamate-induced neurotoxicity

MATERIALAND METHODS

Present study 100 patients of trigeminal neuralgia were undertaken who were divided into two groups .Group I comprised of 50 patients who were given carbamazepine alone and in Group II 50 patients were given carbamazepine along with omega -3 fatty acids. The minimum age of the patient was 35 years and the maximum age was 70 years. The diagnosis of TN was strictly made on the basis of clinical criteria defined by The International Headache Society.[2]

The patients were divided into two groups and complete haemogram was performed for both the Groups before starting with the medication. Group I consisted of 50 patients who were given carbamazepine 200 mg thrice daily. The group II comprised 50 patients who were given Carbamazepine 200 mg along with omega-3 fatty acids 300 mg thrice daily.

INCLUSION CRITERIA

Patients who were diagnosed with TN for the first time and who were not on any kind of medication nor were suffering from any systemic disease.

EXCLUSION CRITERIA

Those patients who were previously diagnosed for TN and those who had positive systemic history

The patients were given the questionnaire, Modified Brief Pain Inventory (BPI) which is a simple, carefully validated, and widely used questionnaire in the field of chronic pain.[6] The questionnaire dealt with pain intensity and interference of pain in routine activities such as sleeping, walking, and overall mood. This instrument is composed of items on 1-point scale (0–10) on pain intensity and four questions on the interference of pain with general life activities. Patient pain was evaluated with modified-BPI scale on the day the patient reported and current pain score was recorded. The questionnaire dealt with pain intensity and interference of pain in routine activities such as sleeping, walking, and overall mood. This instrument is composed of items on 1-point scale (0–10) on pain intensity and four questions on the interference of pain with general life activities. Patient pain was evaluated with modified-BPI scale on the day the patient reported and current pain score was recorded.

RESULTS

In the present study, the mean age for group II was 60.5 years and for the group I was 60.0years with no statistical significant difference between the two ($P > .05$). The mean score of current pain was 9.05 in group I patients and 9.01 in group II patients. The mean score of the pain at the end of 2nd week, 6th week, and 14th week in group I patients was 5.90, 3.93, and 2.24, respectively. The mean score of pain

at the end of 2nd week, 6th week, and 14th week in group II patients was 5.54, 3.54, and 0.8, respectively [Table 1].

When the pain scores were compared between group I and group II at different time intervals, the difference was found to be statistically significant at all time intervals.To assess the change in percentage of pain reduction between both the two groups, *t*-test was performed which showed that the reduction in pain percentage was highly significant at end of 14th week in group II patients (P <.005) and nonsignificant at 2nd week and 6th week [Table 2].

Table 1: Comparison of pain score in group I and group II at follow ups

Change of pain at follow-ups in both groups				
Pain (mean score)	**Current**	**2 weeks**	**6 weeks**	**14 weeks**
Group 1	9.05	5.90	3.93	2.24
Group 2	9.01	5.54	3.54	0.80
P	0.201	0.080	0.063	<001

Table 2: Comparison of percentage change at follow up in pain in group I and group II

Percentage change in pain from current pain (in %) in both groups			
Pain (mean score)	**2 weeks**	**6 weeks**	**14 weeks**
Group 1	34.64	56.73	74.94
Group 2	35.12	58.14	89.91
P	0.084	0.499	<001

DISCUSSION

Trigeminal neuralgia is a chronic pain condition that affects the trigeminal nerve, which carries sensation from our face to brain. If anyone has trigeminal neuralgia, even mild stimulation of your face — such as from brushing our teeth or putting on makeup — may trigger a jolt of excruciating pain.

Patient initially experience short, mild attacks. But trigeminal neuralgia can progress and cause longer, more-frequent bouts of searing pain. Trigeminal neuralgia affects women more often than men, and it's more likely to occur in people who are older than 50.[6]

An anticonvulsant drug called carbamazepine is usually the first choice for treating pain associated with typical TN. Other anticonvulsant drugs that may be prescribed include oxcarbazepine, phenytoin, lamotrigine, sodium valproate, gabapentin, clonazepam, and topiramate.Tricyclic

Antidepressants such as amitriptyline or nortriptyline are used to treat symptoms associated with atypical trigeminal neuralgia. Baclofen is a muscle relaxant that may be used alone or along with carbamazepine or phenytoin. Botulinum toxin injections may be used to block sensory nerves. Nerve blocks are also used in some instances to provide temporary relief. Patients who do not respond to drug therapy or whose condition worsens over time may be candidates for surgery. Several procedures are used to treat TN, depending on the severity of the pain, the patient's preference, physical health, previous surgeries, and surgeries relative risks and benefits .[9]

Omega 3 is an essential fatty acid that helps to strengthen the nerves and ease inflammation. Omega 3 is naturally found in foods such as Salmon and other fatty fish, olives, coconut oil and walnuts. Since it is quite difficult to source an adequate amount of Omega 3 fatty acids through diet alone, taking an Omega 3 supplement such as fish or krill oil may reduce symptoms of neurological dysfunction[10]

Omega-3 fatty acids are an important components of cell membranes phospholipids. The intake of these fatty acids is related to decrease concentration of C-reactive protein (CRP), pro -inflammatory eicosanoids, cytokines, chemokines and other inflammation biomarkers. Many of clinical trials have shown the beneficial effect of dietary supplementation with omega-3 fatty acids in inflammatory and autoimmune diseases in human.

Tokuyama and Nakamoto have proposed the possible involvement of DHA in pain control because of its dose-dependent antinociceptive effects observed in various pain tests and its calming effect on neuropathic pain.[7]

Methylcobalmin is one active form of vitamin B12 which can directly participate in homocysteine metabolism. More and more researches showed that MeCbl has beneficial effects on clinical and experimental peripheral neuropathy and trigeminal neuralgia..A clinical trial proved that the pain of TN patients was alleviated greatly in the methylcobalamin ,and no recurrence of TN in pain symptoms was closed to 64%.[12]

In present study omega -3 fatty acids and methylcobalamin along with carbamazepine was administered to study the potential effect omega-3 fatty acids in treatment of trigeminal neuralgia. The omega-3 fatty acids at a dose of the 900 mg per day and methyl cobalamin at a dose of 1500mcg was given to the group II patients in three divided dose in addition to carbamazepine 600 mg per day. The results were not significant at the end of 2nd and 6th week.

However, the results were statistically significant by the end of 14th week, which indicates that long-term use of omega-3 fatty acids and methylcobalamin could be more beneficial.

CONCLUSION

In conclusion, the present study group 2 patients who were given omega-3 fatty acids along with carbamazepine, they showed the reduction in neuropathic pain in comparison to group I who were administered only Carbamazepine. So it can be concluded that omega-3 fatty acids have a role to play in pain relief in neuralgic patients. However further studies are required on larger sample size, for longer duration of time to establish the fact that omega-3 fatty acids have a substantial role in relieving neuralgic pain.

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