Original Article

EFFECTIVENESS OF CARBAMAZEPINE VERSUS OXCARBAZEPINE IN THE MANAGEMENT OF TRIGEMINAL NEURALGIA

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ABSTRACT

Objective: *To compare the effectiveness of carbamazepine versus oxcarbazepine in the management of Trigeminal Neuralgia*

Material and Methods: *This study was conducted over a period of 8 months in 2013, on 202 patients reporting to the Department of Oral & Maxillofacial Surgery, Nishtar Institute of Dentistry, Multan. New patients of either gender, age 30-70 years with features of trigeminal neuralgia (TN) with pain intensity of moderate to severe were included in this study. Patients were divided in two groups. One group was treated with oxcarbazepine and other group with carbamazepine.*

Results: *A total of 202 patients, 131 females (64.85 %) and 71 males (35.15 %) were included in this study. The mean age of these patients was 58.04 ± 7.78 years with an age range of 30-72 years. The relief of pain score in carbamazepine group was 26 (25.7%) and in oxcarbazepine group was 85(84.2%).There was a significant difference among both groups (p value=0.00005).*

Conclusions: *Oxcarbazepine is more effective than carbamazepine in relieve pain intensity.*

Key words: *Trigeminal Neuralgia, Facial Pain, Carbamazepine, Oxcarbazepine.*

INTRODUCTION

In the primary care setting, diagnosis and initial treatment of orofacial pain are often performed by family physicians and dental surgeons[1]. Trigeminal neuralgia is a specific disorder diagnosed on clinical findings, a thorough clinical history and physical examination. Trigeminal neuralgia is defined by the International Association for the Study of Pain as "a sudden, usually unilateral, severe, brief, stabbing, recurrent pain in the distribution of one or more branches of the fifth cranial nerve"[2-4].

The trigger zone is always ipsilateral to the pain. Common extra oral trigger zone occur above the supra orbital foramen, inner canthus of eye, lateral to the ala nasi and over the mental foramen[3]. Triggers include touch, certain head movements, talking, chewing, swallowing, shaving, brushing teeth, or even a cold draft. The most commonly affected dermatomal zones are innervated by the second and third branches of the trigeminal nerve[5].

Trigeminal neuralgia is an idiopathic disorder. Occasionally, however, Trigeminal neuralgia constitutes manifestations of central nervous system lesions (symptomatic trigeminal neuralgia), such as tumors, cysts, multiple sclerosis (MS) or arteriovenous malformations[3,6].

There is a lack of certainty regarding the aetiology and pathophysiology of trigeminal neuralgia and there is a wide range of treatments available[7].

Pharmacological therapy is the first line of treatment in the management of Trigeminal neuralgia. The

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goal of the medical management is the reduction of neuronal hyper excitability in the peripheral nervous system, the central nervous system or both[3,8].

Anticonvulsants, such as carbamazepine, phenytoin, gabapentin, lamotrigine, oxcarbazepine, and topiramate are used commonly. These drugs can cause side effects (e.g. drowsiness, unsteadiness, nausea, skin rash, blood dyscrasias). Therefore, patients are monitored routinely and undergo blood tests to ensure that the drug levels remain safe to minimize side effects[4]. In patients whose disease is medically refractory because of sustained, intolerable side effects from medication, a surgical procedure is considered[9].

Surgical procedures that can reduce the frequency and severity of trigeminal neuralgia attacks induce Peripheral surgery, percutaneous ablative procedures, stereotactic radio surgery and micro vascular decompression[3]. Oxcarbazepine, a recently introduced antiepileptic drug, was found to possess antineuralgic properties in neuropathic pain. The dual mode of action of oxcarbazepine, modulating both voltage-sensitive sodium channels and high-voltage activated N-type calcium channels, raises the possibility that oxcarbazepine can target certain underlying mechanisms known to be important in the genesis of both peripheral and central sensitization[10].

METHODS AND MATERIALS

A randomized clinical trial conducted over a period of 8 months on 202 patients reporting to the Department of Oral & Maxillofacial Surgery; Nishtar Institute of Dentistry, Multan with a kn of TN. New cases in patient of both gender between 31-70% age were included in this study. Patient already taking any kind of medication for the treatment of neuralgia, have underson surgical procedure for management of Trigeminal Neuralgia had done previously or who show hypersensitivity to carbamazepine or oxcarbazepine were excluded from this study. Patients with acute or chronic liver or renal failure and those patients not willing for follow up were also excluded from the present study.

Ethical issues were considered and managed during the study after approval from the hospital ethical committee. After explaining all the benefits and risks to the patients, written informed consent was taken from the patients. Patients were randomly allocated into two equal groups (group A, group B) by using the lottery method (202 slips were made with name, Group A and Group B, each patient were asked to pick one slip, whatever Group's name is there on the slip, that drug was prescribed accordingly).Group A was treated with oxcarbazepine 200mg BD daily upto 1200mg. Group B was treated with carbamazepine daily 200mg twice a day upto1800mg. Bias was controlled by randomly allocating the patients by single person (researcher). Patients were asked to use visual analogue scale to score the pain and note the score in diary. Pain relief was observed after 3 days, 1 month, and 2 months interval in follow-up. All informations were collected on a specially designed proforma.

All data was compiled and analyzed using SPSS-10. Descriptive statistics were calculated for all variables. Mean and standard deviation was calculated for all qualitative variables like age of patients, pain intensity. Post medication final pain assessment was done at the end of two months. Frequency and percentages were calculated for qualitative variables like gender for that t- test were applied. Confounding variables like age, gender were controlled by making stratified cross matching tables. P-value less than 0.05 was considered as significant.

RESULTS

Out of total 202 patients with trigeminal neuralgia. A total 131 females were presented in the study forming 64.85% while 71 males were formed 35.15%.

The mean age of these patients was 58.04 ± 7.78 years with an age range of 35-72 years. Distribution of age is given in Table-1.

Right side of the face was involved in 127 cases forming 62.85% while left side was involved in 75 cases forming 37.15% of all the patients.

The most common division of trigeminal nerve involved in this study was the mandibular division in 135 cases forming 66.8% of all the patients followed by maxillary division involved in 62 cases forming 30.7% of all the patients followed by ophthalmic division involved in 5 cases forming 2.5% of all the patients.

Among the branches of mandibular division,-

mental nerve was involved in 89 (44.05%) cases while among the branches of maxillary division, infra orbital nerve was involved in 52 (25.75%) cases. Distribution is given in Table-2.

The mean pain score in carbamazepine group was 3.42± 0.82 and in oxcarbazepine group was 4.21±0.98.There is a significant difference in the pain score among both groups (p value=0.00005). Detail are given in Table-3.

The relief of pain score in carbamazepine group was 26(25.7%) and in oxcarbazepine group was 85(84.2%). No relief in carbamazepine group in 75(74.3%) and in oxcarbazepine gropu . no relief was observed in 16(15.8%).There is a significant difference among both groups(p value=0.00005).

DISCUSSION

Trigeminal neuralgia is chronic pain syndromes for its symptomatology and high frequency with which it responds to anticonvulsant medications, particularly carbamazepine[11].

Table-1: Distribution of the patients according to the age

AGE (yrs)	Total no.of cases	Min.	Max.	Mean	Standred deviation
	202	35 yrs	72 yrs	58.04 yrs	7.78 yrs

TABLE-2: Distribution of patients according to the branches

Branch Involved	n	%
Mental nerve	89	44.05
Lingual nerve	8	3.97
Long buccal nerve	7	3.46
Inferior alveolar nerve	31	15.34
Infra orbital nerve	52	25.75
Nasopalatine nerve	4	1.98
Posterior superior alveolar	6	2.95
Supra orbital nerve	3	1.48
Supra trochlear nerve	2	0.99
Total	202	100

Table-3: Difference in pain score between carbamazepine versus oxcarbazepine.

Mean pain score	Carbamazepine group	Oxcarbazepine group	p-value
	3.42 ± 0.82	4.21 ± 0.98	0.00005

The exact cause and the pathology of the trigeminal neuralgia are still controversial. No point is saved in the trigeminal pathway in which a lesion has not been described. Mechanical factors like tentorial ossification[12], vascular compression by the superior cerebellar[13], anterior inferior cerebellar and basilar artery and arteriovenous malformation of the cerebellopontine angle are considered as possible causes.

In present study, total of 202 patients presented with trigeminal neuralgia were treated. The mean age of these patients were 58.04 ± 7.78 years with an age range of 35-72 years. Arguelles et al[14] conducted a study on thirty five patients in which he prescribed oxcarbazepine in trigeminal neuralgia (TN) unresponsive to treatment with the standard antiepileptic drug carbamazepine for at least 12 weeks. Pain was assessed using mean pain frequency, responder rate, pain-free patients and clinical global impression. The mean maintenance dose was 773.7 mg/day. There was a significant decrease in the mean of the main scores following 12 weeks of treatment ($p < 0.05$) compared with baseline. Oxcarbazepine was effective from the first month of treatment. There was a significant reduction in pain frequency, leading to improvements in patient satisfaction. In general, oxcarbazepine was well tolerated.

Solaro et at[15] , in one of his study prescribed oxcarbazepine (dosage 600-1200 mg/day) in 12 multiple sclerosis (MS) patients suffering from painful paroxysmal symptoms(PPS). The subjective level of the PPS was scored using a three-point scale (0-3). The mean dosage of oxcarbazepine was 1033 mg daily. Nine patients experienced a complete and sustained recovery within 1 month from treatment initiation (T0 vs. T1, $p>0.05$)

In our study, the mean pain score in carbamazepine group was 3.42±0.82 and in oxcarbmazepine group was 4.21±0.98.There is a significant difference in the pain score among both groups(p value=0.00005).

Zakrzewska et al[16], in one of his study on 29 patients described that a total of 16 (55.2%) females presented with trigeminal neuralgia while a total of 13 (44.8%) males presented with trigeminal neuralgia. Warraich[17], described in his study that 55 female (61%) presented with trigeminal neuralgia while 35 male (39%) presented with trigeminal neuralgia. Sohail et al[18], in his study described 32 (64%) females presented with trigeminal neuralgia while 18(36%) males present-

ed with trigeminal neuralgia. In our study, 131 (64.9%) females presented with trigeminal neuralgia while 71 (35.1%) males presented with trigeminal neuralgia. Female formed an overwhelming majority of the patient population with a percentage of 64.9% in our study.

Right side was involved in 127 cases forming 62.9 % while left side was involved in 75 cases forming 37.1%. Compared to our study Shah et al[2], found right side of face was involved in 32 patients (64%) and left side in 18 patients (36%).Compared to our study Sohail et al[18], found right side of face was involved in 31 cases forming 62% and left side in 19 patients forming 38%.

Mandibular division is involved in 135(66.8%) cases, while maxillary division in 62(30.7%) cases and ophthalmic division in 5(2.5%) cases. Compared with our study Shah et al[2], described involvement of mandibular division in 30 cases (60%) followed by the maxillary division in 17 cases (34%) and also involvement of ophthalmic division in 3 cases (6%).

In our study mental nerve was involved in 89 cases (44.05%) among the mandibular division branches while infra orbital nerve was involved in 52 cases (25.75%) among the maxillary division branches. Compared with Sohail et al[18] study, in which mental nerve involvement was 44% among the mandibular division branches while infra orbital nerve involvement was 30% among the branches of maxillary division.

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