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Original Research

Comparing the Efficacy of Carbamazepine and Gabapentin in the Management of Trigeminal Neuralgia: A Hospital based Clinical Study

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ABSTRACT:

Introduction-Trigeminal neuralgia (TN) is a disease characterized by of unilateral, paroxysmal, stabbing facial pain, originating from the trigeminal nerve. The Pain in Trigeminal neuralgia is characterized as sharp, intense and lancinating in nature. The gold standard drug in terms of efficacy in management of Trigeminal Neuralgisa is still Carbamazepine. Other drugs used for treatment of Trigeminal neuralgia (TN). such as gabapentin, oxcarbazepine, baclofen, lamotrigine, levetiracetam,valproate and botulinum toxin A injection. **Objective-** To compare the Clinical efficacy of Carbamazepine and Gabapentin in the management of Trigeminal Neuralgia. **Materials and Methods-** A total of 52 patients with a mean age of 52.78 years included in the study were randomly divided into two groups A and B and were given the tablets of carbamazepine in the dose range of 400mg to 1200 mg and gabapentin in the dose range of 600mg to 1800mg and recalled after 5th day, 15th day, 1 month and 3 month period to evaluate the response to the drugs. The collected data was subjected to statistical analysis. **Results-** There is significance difference in the response rate of carbamazepine($p>0.05$) as therapeutic drug for trigeminal neuralgia. While there is significance difference in the response rate of gabapentin ($p>0.05$) as therapeutic drugs for trigeminal neuralgia .After three months there is significant difference in response of two drugs studies ($P>0.05$) .In short duration of management of trigeminal neuralgia both drugs showing significant difference in response however gabapentin shows less side effect as compared to carbapamazipine. However in long term duration(upto 3 month) carbazapine showing significant response as compared to gabapentin.($P<0.004$). **Conclusion-** So,it has been concluded in our that carbamazine is potent drug for trigeminal neuralgia in long term management as compared to gapapentin, however gabapetine is suitable drug for short duration with fewer side effect.

Keywords: trigeminal neuralgia, therapeutic efficacy, Carbamazepine, gabapentin

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INTRODUCTION

The trigeminal neuralgia (TN) is defined as sudden, usually unilateral, severe, brief, stabbing, lancinating, recurring pain limited to the distribution of one or more divisions of the trigeminal nerve."[1] According to International Headache society, Trigeminal neuralgia (TN) can be classified as classical or idiopathic trigeminal neuralgia and the symptomatic trigeminal neuralgia. Trigeminal neuralgia is diagnosed by following criteria.

1. Attacks of pain that Paroxysmal in nature is lasting from a fraction of a second to two minutes that affect the trigeminal nerve
2. The characteristics of Pain has at least one of the following characteristics: Intense, sharp, superficial, or stabbing which can be precipitated from trigger areas or by trigger factors
3. Individual patients has experience similar attack.
4. Clinically no evidence of neurological deficit
5. It is not attributed to another disorder.

As revealed by various studies the incidence and prevalence of Trigeminal neuralgia globally is

approximately ranging from 4 to 28.9% and usually it occurs in fourth to fifth decade of life and affects females more commonly than males as revealed by various studies;.[2- 5], Chronic prevention should be required when severity and frequency of attacks increases with time. After the diagnoses of Trigeminal neuralgia medical therapy must be started immediately, and surgical options should be considered whenever there is failure to respond to the medicinal therapy.

For controlling pain in classic or idiopathic Carbamazepine is established as an effective drug Trigeminal neuralgia as by guidelines of American Academy of Neurology- European Federation of Neurological Societies(2008) [6]. For the treatment of idiopathic Trigeminal neuralgia other drugs such as oxcarbazepine, gabapentin, baclofen, phenytoin, lamotrigine, pregabalin, and topiramate can also be used. This clinical study was undertaken to evaluate the effectiveness of two pharmacological drugs, carbamazepine and gabapentin , in patients with idiopathic Trigeminal neuralgia.

MATERIALS AND METHODS

This study was undertaken in an esteemed Dental College & Hospital of North India. Ethical clearance was obtained, before undertaking of the study.

INCLUSION CRITERIA

According to the International Society of Headache guidelines, detailed clinical history and examination was done and diagnosis of trigeminal neuralgia was made. Then consent was taken from every diagnosed patient.

Trigeminal neuralgia patients were divided in two group,group1 & group 2 numbered them from 1 to 52 for drug trial (monotherapy) irrespective of age, sex, caste, duration and intensity of pain, etiologic factors, division of trigeminal nerve and side of face affected.

EXCLUSION CRITERIA

The patients with odontogenic pain and temporomandibular disorders. Patients who did not give consent for study were excluded from the study.

METHODOLOGY

One carbamazepine 200 mg and one gabapentin 300 mg tablets removed from the strips and stored in packets that labeled as X and Y. The tablets were given to another physician and the patients of both groups were blind about the packets. 6 tablets are given to each one patient and each patient was given a dose of 400 mg of carbamazepine and 600 mg of gabapentin initially and was recalled after third day. The carbamazepine dose was increased from 200 to 800 mg and dose of Gabapentin was increased to 900 mg on third day and the patients were recalled after 15th day. The carbamazepine dose was increased to 1200 mg and doge of gabapentin to 1800 mg on 15th day, and the patients were recalled after 1 month and 3 months period for review of response to the drugs.Other physician who was blind about the patients as well as the drugs did the review of response. The response of the patients to therapeutic effectiveness of drug was decided based on the frequency of attacks, i.e., good response: no attacks of pain; average response: two to three attacks of pain per day; and nonresponsive with no decrease in the frequency of attacks of pain. The data thus collected by the third physician were handed over to the first physician who had diagnosed and numbered the patients. The collected data were subjected to statistical analysis.

RESULTS

A total of 52 patients in the age group 40–65 years, with a mean age of 52.78 years were included in the study. Out of 52 patients, 24 were females and 18 were males. All patients are divided into 2 equal group of 26 of group-A & group -B. We treat group A with Carbamazepine (dose 400 to 1200 mg) and group B, with Gabapentin (600mg to 1800mg)

Table 1- Distribution of patients in Group A and Group B (Old case)

Total no of patient-52	Old cases	Adverse effect	No Adverse effect
Group –A 26	15	5(33.3%)	10(66.6%)
Group - B 26	18	2(12.2%)	16(88.8%)

Group-A (Carbamazepine), Group B- Gabapentin

Table 2- Distribution of patients in Group A and Group B (New case)

Total no of patient-52	New cases	Adverse effect	No Adverse effect
Group –A 26	11	3(27.2%)	8(72.7%)
Group - B 26	08	1(12.5%)	7(87.5%)

Table 3: Therapeutic response to the carbamazepine

Time	Dose	Good response	Average response	No response
3rd day	400 mg	12	7	7
15th days	600 mg	14	10	2
I month	1200 mg	17	9	0
3rd month	1200 mg	19	7	0

X^2=17.2; df=6; P=0.008(Significant)

Table 4-Therapeutic response to the gabapentin

Time	dose	Good response	Average response	No response
3 rd day	600	14	8	4
15th day	900	18	8	0
1 month	1800	23	3	0
3 month	1800	26	0	0

X^2=76.0; df=6; P<0.001(Significant)

Table 5: Intergroup comparison of response to carbamazepine and gabapentin

Duration	X2	P
3rd day	X^2=1.04,; df=2	P=0.595
15 th day	X^2=2.72; df=2	P=0.256
1 month	X^2=3.90; df=1	P=0.048
3 month	X^2 =8.09; df=1	P=0.004

Chi-square test P<0.004(Significant)

In group A,15 patients were already under treatment for TN, taking a dose of carbamazepine ranging from 400 to 1200 mg/day while In group B, 18 patients were already under treatment for TN, taking a dose of Gabapentin (600mg to 1800mg.)

In old cases 33.3% Patients shows adverse effect in group A, while 12.2% patients report adverse effect in group B.(**Table 1)**

Similarly In new cases 27.2%Patients shows adverse effect in group A,while 12.5% patients report adverse effect in group B.(**Table 2)**

Table 3 shows the significance difference in the response rate of carbamazepine

(p>0.05) as therapeutic drug for trigeminal neuralgia. While Table 4 shows the significance difference in the response rate of gabapentin (p>0.05) as therapeutic drugs for trigeminal neuralgia.

After three months there is significant difference in response of two drugs studies (P>0.05) .In short duration of management of trigeminal neuralgia both drugs showing significant difference in response however gabapentin shows less side effect as compared to carbapamazipine.

However in long term duration(upto 3 month) carbazapine showing significant response as compared to gabapentin.(P<0.004)

DISCUSSION

The first-line therapy for management of Trigeminal neuralgia is Carbamazepine although gabapentin also has effective in many cases.

The daily dose of Carbamazepine should be increased by 100 mg every other day until relief from pain is attained or until intolerable side effects that prevent further upward titration. The typical total maintenance dose is 300–800 mg/ day, which should be given in two to three divided doses. A maximum total dose of 1200 mg/day could be given.[7,8]

Sedation, dizziness, nausea, vomiting, ataxia, increase in the level of hepatic enzymes, and hyponatremia are common side effect of Carbamazepine .Due to hyponatremia Carbamazepine may contraindicate in elderly patients. The serious side effects but uncommon include leucopenia, aplastic anemia, allergic rash, systemic lupus erythematosus, hepatotoxicity, and Stevens-Johnson syndrome. Therefore, the complete blood count, serum sodium, and liver function tests within several weeks after starting therapy.

In our study, 73.07% of patients had good response to the carbamazepine therapy when dose was increased up to 1200 mg per day in divided doses while 100% patients had good response to the gapapentin when dose was increased up to 1800 mg per day in divided doses.

The adverse effects were observed in 33.3% in old case & 27.2% in new cases having 1200 mg of carbamazepine per day, but on the contrary only 12.5% of patients having 1800 mg of gabapentin per day experienced adverse reactions in both old & new cases.

In a study conducted by Kaur and Dhir in 2018 concluded that the therapeutic effectiveness of carbamazepine recorded as good response in 52.38% of patients of group A after 72 hours of recall while 28.57% patients had an average response and 19% patients had not relieved off pain attacks at the dose of 400mg of carbamazepine while the therapeutic effectiveness of gabapentin recorded as good response in 52.38% of group B patients after 72 hours of recall while 42.8% patients had an average response at the dose of 600mg of gabapentin. This study in not in consistant to ours as gapapentin is more potent in short term regime in our study.

A study conducted by Lemos et al. (2008) found that gabapentin showed adequate efficacy alone and in combination with local injections of ropivacaine used to block trigger points in TN patients, which is in accordance with our study.[9] The therapeutic effectiveness of gabapentin was found in the range of 70–100% of patients with increase in dose from 300 to 1800 mg, which was in accordance with other study.[10]

CONCLUSION

It has been concluded in our that carbamazine is potent drug for trigeminal neuralgia in long term management as compared to gabapentin, however gabapetine is suitable drug for short duration with fewer side effect.

REFRENCEES

1. Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders: 2nd edition. Cephalalgia 2004;24 Suppl 1:9-160.
2. Dieleman JP, Kerklaan J, Huygen FJ, Bouma PA, Sturkenboom MC. Incidence rates and treatment of neuropathic pain conditions in the general population. Pain 2008;137:681-8.
3. Koopman JS, Dieleman JP, Huygen FJ, de Mos M, Martin CG, Sturkenboom MC, et al. Incidence of facial pain in the general population. Pain 2009;147:122-7.
4. Katusic S, Williams DB, Beard CM, Bergstralh EJ, Kurland LT. Epidemiology and clinical features of idiopathic trigeminal neuralgia and glossopharyngeal neuralgia: Similarities and differences, Rochester, Minnesota, 1945-1984. Neuroepidemiology 1991;10:276-81.
5. Hall GC, Carroll D, McQuay HJ. Primary care incidence and treatment of four neuropathic pain conditions: A descriptive study, 2002-2005. BMC Fam Pract 2008;9:26.
6. Cruccu G, Gronseth G, Alksne J, Argoff C, Brainin M, Burchiel K, et al. AAN-EFNS guidelines on trigeminal neuralgia management. Eur J Neurol 2008;15:1013-28
7. Granger P, Biton B, Faure C, Vige X, Depoortere H, Graham D, et al. Modulation of the gamma-aminobutyric acid type A receptor by the antiepileptic drugs carbamazepine and phenytoin. Mol Pharmacol 1995;47:1189-96.
8. Joffroy A, Levivier M, Massager N. Trigeminal neuralgia. Pathophysiology and treatment. Acta Neurol Belg 2001;101:20-5
9. Lemos L, Flores S, Oliveira P, Almeida A. Gabapentin supplemented with ropivacain block of trigger points improves pain control and quality of life in trigeminal neuralgia patients when compared with gabapentin alone. Clin J Pain 2008;24:64-75.
10. Taylor CP, Gee NS, Su TZ, Kocsis JD, Welty DF, Brown JP, et al. A summary of mechanistic hypotheses of gabapentin pharmacology. Epilepsy Res 1998;29:233-49.