Original article

Prophylactic treatment of chronic tension-type headache with trigger points: Comparison of oral gabapentin and local injection of depomedrol

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BACKGROUND: This study was designed to compare the effectiveness of oral gabapentin and locally injected depomedrol in trigger points (TrPts) of the head of patients suffering from chronic tension type headaches (CTTH). **METHODS:** In this study patients with a diagnosis of CTTH who had at least one active trigger point in their scalp were recruited. Patients were randomly divided into two groups: one receiving depomedrol and the other receiving gabapentin. Depomedrol was injected 10 mg per each TrPt up to a total dose of 40 mg in each patient. Gabapentin was initiated with 200 mg/day and was gradually increased to 300-600 mg daily depending on the therapeutic response. Patients were followed for two months and during the study patients were given a headache diary to record the number, duration and intensity of their headaches, these records were compared at baseline one month and two months after the initiation of therapy. **RESULTS:** Headache *Intensity* × *Duration* index showed a significant decrease in both groups. It was however, significantly lower in depomedrol receiving patients at the end of the first 4 weeks (368.13 ± 195.75 Vs. 467.73 ± 203.09, $p < 0.05$), and the second 4 weeks (165.44 ± 62.75 Vs. 238.68 ± 81.39, $p < 0.05$). Similar superiority was detectable for intensity, duration and frequency of headaches ($p < 0.05$). **CONCLUSIONS:** We found trigger point injection with depomedrol to be a more potent prophylactic agent in comparison to daily oral gabapentin.

KEYWORDS: Headache, Tension, Gabapentin, Depomedrol, Prophylaxis

BACKGROUND

Chronic tension-type headache (CTTH) is a common type of headache and often highly resistant to treatment which leads to great morbidity in patients.[1-3] Approximately 12% of patients suffering from CTTH lose their workdays with an average of 27.4 days per year and half of the patients report decreased effectiveness during daily work.[4]

CTTH is usually bilateral, with compressive quality and mild to moderate severity and is mostly located in the posterior of the head and neck. The duration varies from a few minutes to several days.[5] The diagnosis of CTTH is made based on the international headache society criteria.[5-7]

In CTTH, trigger points (TrPts) are considered as important causative factors.[8-10] Trigger points are discrete, focal, hyperirritable spots located in a taut band of skeletal muscle and are classified as active or latent. Palpation of the active TrPts leads to the patient feeling pain but a latent trigger point is clinically silent with respect to pain but may cause restriction of movement and weakness of the affected muscle. [8-10]

In the management of this type of headache, simple analgesics such as naproxen, ibuprofen, and etcetera, should be limited to 2 or less weekly,[11,12] and instead patients should be encouraged to use prophylactic agents, such as amitriptyline, tizanidine and gabapentin to achieve a favorable treatment response.[13-21] gabapentin, an antiepileptic drug, has been proven suitable for preventing CTTH.[22-24] The effective dose of gabapentin varies greatly, with some patients needing only 200-300 mg a day whereas others may need 2000 mg or more a day.[25,26] There are also various modalities for trigger points (TrPts) therapy, such as the spray and stretch techniques, ultrasound, manipulative therapy, and inactivate TrPts.[27] One treatment modality for TrPts therapy is local injection of anesthetics or corticosteroids in the trigger points in the scalp to inactivate it, however, the studies about corticosteroid injection are limited.[27]

This study was designed to compare the effectiveness of oral gabapentin and locally injected depomedrol in TrPts of the scalp of patients suffering from CTTH.

METHODS

Patients:

Patients with a diagnosis of CTTH, according to

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international headache society criteria,[5-7] who had at least one active trigger point in the scalp the stimulation of which created a headache just similar to the original headache were recruited from neurology clinics in Isfahan and Tehran from 2007 to 2009. Recruited patients were randomly assigned to two groups (parallel-group method): one receiving oral gabapentin (Pfizer pharmaceutical) and the other one underwent local injection of depomedrol (40mg Vials (Pfizer pharmaceutical) in TrPts. All patients were followed for two months.

Patients with concomitant diseases and those who took other medications were excluded. We enrolled patients who were not taking any prophylactic agents. Using simple analgesics were allowed in case of a headache attack.

Signing an informed consent was mandatory for all patients prior to enrollment and the study protocol was approved by the local ethical committees.

Drugs:

Before depomedrol injection, we checked for any bleeding tendencies by performing a complete blood count test and coagulation test. We followed the injection technique which was used by Alvarez et al.,[27] inserting the needle 1-2 cm away from the trigger point at a 30 degrees angle to the skin. Then, 10 mg of Depomedrol was injected in each trigger point up to the total dose of 40 mg in each patient using 22-gauge 2-inch needle. Single depomedrol injection was made at the beginning of the study.

In the gabapentin group, the drug was initiated with 200 mg/day dosage and was gradually increased to 300-600 mg daily.

Measurements:

Patients were given a headache diary to record duration, intensity and frequency of headaches during the study period. Intensity was recorded on an 11-point verbal rating scale, where 0 indicated the headache-free condition, 5 a moderate headache and 10 the worst headache condition possible. We also calculated (intensity × duration) index for each patient. Monthly visits were planned to check for any side-effects or complaints and to collect headache data from diaries.

Statistical analysis

Statistical paired t-test , and SPSS software version 11.5 (Chicago, IL, USA) were used and a P-value of less than 0.05 was considered significant.

RESULTS

We screened 311 CTTH patients with active trigger points in this study. Two hundred and seventy eight patients were enrolled in the study. One hundred and forty (52 male, 88 female) patients were allocated to the gabapentin group and 138 patients (45 male, 93 female) entered the depomedrol group. 126 (45 male, 81 female) of the patients in the gabapentin group and 123 patients (43 male, 80 female) of the depomedrol group completed the three month period of the study. The drop outs were due to the fact that the researcher was unable to follow-up with some patients, and none were excluded because of side-effects or worsening of the headaches.

Tables 1-3 show the differences between headache intensity, frequency and duration between the groups during the study. Headache intensity decreased in both groups after the first month of drug therapy (Table 3). It decreased more significantly in the depomedrol group (Table 3) and this trend also continued after the second month of therapy (Table 3).

In Both groups a decrease in headache duration was noted after the first month of drug therapy, but patients receiving depomedrol reported significantly shorter durations of headaches (Table 2). This difference continued during the second month of therapy (Table 2).

Regarding the number of attacks, depomedrol was also superior to gabapentin. Significant difference between the two groups was seen at the end of the first and second month of therapy (Table 1).

Headache (intensity × duration) index showed a marked decrease in both groups. By the end of the first month of therapy, it was significantly lower in the depomedrol group and by the end of the second month of therapy this decrement was more significant in the depomedrol compared with the gabapentin group (Table 4).

Headache intensity in two patients of the gabapentin group and four patients of the depomedrol group was slightly aggravated during the study but this did not lead to the discontinuation of the study and they completed the study.

The average dose of gabapentin among our patients was 459.52 ± 150.29 mg per day. The most frequent side effect in gabapentin receiving patients was drug induced sedation in 21 patients (16.7%) and peptic discomfort in 16 patients (12.7%). In depomedrol receiv-

ing patients, local pain at the injection site was the most frequent complaint (40 patients, 32.5%). Sleep disturbance (14.6%) and gastrointestinal discomfort (8.1%) were other noted side effects in the depomedrol group. Five patients noted severe generalized neck and shoulder pain which lasted up to 5 days after depomedrol injection. No other serious side effect was reported and none of the side effects caused patients to discontinue the drugs.

DISCUSSION

To the best of our knowledge there is no prior published study to compare these two different methods of therapy with. Most patients find single local injection of trigger points more comfortable than taking daily drug for a long period. In addition, gabapentin caused sedation in most patients especially in the first weeks. Therefore, local injection of trigger points is a more comfortable treatment modality for daily activities of patients. In this study injection of depomedrol in trigger points of patients with chronic-type tension headache was significantly superior to orally administered gabapentin in terms of reducing the severity, duration and number of headache attacks. This superiority was detectable after the first month and was sustained through the second month. Both treatments were well tolerated and no serious side effect was reported.

A limitation of this study is that we only followed patients for two months and it is not clear how long locally injected depomedrol can suppress the pain. Another limitation is related to the dosage of gabapentin. While high doses such as 2000 mg per day are noted by some authors to be effective,[25,26] we did not administer doses higher than 600 mg per day to avoid sever sedation in patients.

In conclusion, we found trigger point injection to be a more potent prophylactic agent in comparison to daily gabapentin. This superiority was statistically significant after 4 weeks and continued up to the 8th week. It should be noted that trigger point injection was more effective in decreasing intensity, duration and frequency of headaches. Further studies are recommended to validate our results.

Table 1. Number of attacks compared between the groups during the study

	Baseline	1st month	2nd month	P-value
Gabapentin	18.27 ± 2.68	13.63 ± 3.29	10.63 ± 3.07	p < 0.01
Depomedrol	20.14 ± 3.16	10.54 ± 3.67	8.06 ± 2.19	p < 0.01
P-value	p > 0.05	p < 0.05	p < 0.05	-

Table 2. Duration of attacks compared between the groups during this study

	Baseline	1st month	2nd month	P-value
Gabapentin	154.27 ± 44.20	97.22 ± 41.57	57.27 ± 21.14	p < 0.01
Depomedrol	151.18 ± 52.71	81.12 ± 37.19	43.09 ± 25.18	p < 0.01
P-value	p > 0.05	p < 0.05	p < 0.05	-

Table 3. Intensity of attacks compared between the groups during the study

	Baseline	1st month	2nd month	P-value
Gabapentin	5.89 ± 0.26	4.79 ± 0.55	4.07± 0.61	p < 0.01
Depomedrol	5.94 ± 0.32	4.51 ± 0.39	3.77± 0.41	p < 0.01
P-value	p > 0.05	p < 0.05	p < 0.05	-

Table 4. Intensity × Duration index compared between the groups during the study

	Baseline	1st month	2nd month	P-value
Gabapentin	915.91 ± 238.86	467.73 ± 203.09	238.68 ± 81.39	p < 0.01
Depomedrol	906.19 ± 259.83	368.13 ± 195.75	165.44 ± 62.75	p < 0.01
P-value	p > 0.05	p < 0.05	p < 0.05	-

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