

THE EFFICACY OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION IN TMJ PAIN- A NON PHARMACOLOGICAL REMEDY FOR IMMEDIATE PAIN RELIEF

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ABSTRACT

Objective: *The aim of this study is to analyze the effect of Transcutaneous electric nerve stimulation in the symptomatic relief of pain in temporomandibular disorders, compared to the administration of analgesic and anti inflammatory agents.*

Material and Methods: *This study was conducted in the department of Oral & Maxillofacial Surgery Khyber College of Dentistry Peshawar and physiotherapy private clinics of Peshawar, Khyber Pakhtunkhwa during a period from May 2012 to June 2013. Fifty patients with temporomandibular disorders irrespective of gender were recruited in this study. Pain assessment was done before intervention by using visual analogue scale. The scoring was recorded on in such a way that a score of 1-3 was designated as mild pain, 4-6 as moderate pain and 7-10 as severe pain.*

Patients were randomly divided into Group I who received Naproxen 500mg twice daily for 10 days. Group II received Transcutaneous electric nerve stimulation thrice during a period of 10 days for about 30-40 minutes per session. A standard Transcutaneous electric nerve stimulation unit (BREMED, Model BD 7900, Italy) was used. Patients were asked to inform the operator in case of any discomfort. Patients were asked to report after 10 days. At this stage again pain assessment was done by visual analogue scale. Information so collected was analyzed using SPSS version 20.

Results: *Majority of the patients in both Group I and Group II reported severe pain before intervention (52% and 40% respectively) while there was no single patient without pain. The post intervention Group I showed 32% patients with severe pain followed by 28% patients in mild category. In Group II, there were 36% patients with moderate pain followed by 32 % patients in mild pain category.*

Conclusion: *Transcutaneous electric nerve stimulation is superior in complete elimination of pain as well as in reduction of severity in temporomandibular joint dysfunction syndrome. This modality of treatment can be applied alone or in combination with low doses analgesics.*

Keywords: *Transcutaneous electric nerve stimulation, temporomandibular joint dysfunction syndrome, Analgesics.*

INTRODUCTION

The temporomandibular joint (TMJ) and the associated neuromuscular system together comprise the temporomandibular system. A defect in any of these two components or problem that prevents this com-

posite system of muscles, bones and joints from working in harmony may result in temporomandibular disorder (TMD)¹. TMD can be divided into two broad categories as myogenous or muscle related TMD and arthrogenous or joint related TMD².

Treatment strategies for TMD are as diverse as the patients that present with it. Each patient is treated in a different way depending on the distinctiveness of the problems. Various treatment modalities have been tested over time e.g analgesic and anti inflammatory

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medications, muscle relaxants, massage therapy, occlusal splints, and cognitive behavioural therapies mainly aimed towards symptomatic relief of pain and discomfort³.

Transcutaneous electrical nervous stimulation (TENS) has been suggested as a treatment strategy in the therapy of TMD. By this method, controlled, low voltage electrical pulses are applied to the nervous system to reduce the symptoms of pain. It has been shown to produce an analgesic effect in symptomatic patients and a positive relaxing effect on the masticatory muscles^{4,5}.

The method of use of TENS device is very important and successful application depends on the definitive location of pain or trigger point. Trigger point is a small, hypersensitive region in muscle, ligament, fascia, or joint capsule from which impulses are transmitted to the central nervous system and cause referred pain^{6,7}. Clinical trials show that excitation of an active trigger point produces the jump sign by the patient in which shortening of the muscle or fasciculation (or both) is evident. Such points are located on masseter, temporalis, and external and internal pterygoids and are involved in temporomandibular joint (TMJ) syndrome and result in referral of pain to other parts of the head and neck⁸.

The aim of this study is to analyze the effect of TENS in the symptomatic relief of pain in TMDs, compared to the administration of analgesic and anti-inflammatory agents.

MATERIALS AND METHODOLOGY

This study was conducted in department of Oral & Maxillofacial Surgery Khyber College of Dentistry Peshawar and physiotherapy private clinics of Peshawar Khyber Pakhtunkhwa during a period from May 2012 to June 2013. An approval of the institutional ethical Committee was obtained. Patients were counseled and informed consent was obtained from each subject.

Fifty patients with TMD irrespective of gender were recruited in this study. Those patients who have internal joint derangement as indicated by history, clinical examination and orthopantomogram and those with previous surgery, trauma or systemic joints disorders were excluded from this study. Patients below age 15 and above age 55 were also excluded.

Pain assessment was done before intervention by using visual analogue scale (VAS). The scoring was recorded in such a way that a score of 1-3 is designated as mild pain, 4-6 as moderate pain and 7-10 as severe pain.

Patients were randomly divided into two groups. Group I comprised those patients who received medications in the form of Naproxen 500mg BID for 10 days. Group II comprised those patients who received TENS thrice during a period of 10 days for about 30-40 minutes per setting. A standard TENS unit (BREMED, Model BD 7900, Italy) was used. Each patient was attended by the same operator. The twins leads were applied over the trigger zone and intensity was set to 1 (rate 2Hz, pulse 240 μ s) gradually changing to 8 (rate 50Hz, pulse 135 μ s). Patients were asked to inform the operator in case of any discomfort. Post intervention pain assessment was done again after 10 days by VAS. Information so collected was analyzed using SPSS version 20.

RESULTS

Out of total 50 patients, 19 (38%) were male and 31 (62%) were female with a male to female ratio of 1:1.63.

Most of the patients were in age group 26-35 (n=19, 38%) followed by age group 15-25 (n=18, 36%). The age distribution is given in table 1.

Majority of the patients in both Groups I and Group II reported severe pain before intervention (52% and 40% respectively) while there was no single patient without pain. The result of pre intervention pain severity is given in Table 2.

The post intervention Group I showed 32% patients with severe pain followed by 28% patients in mild category. In Group II, there were 36% patients with moderate pain followed by 32% patients in mild pain category. The result of post intervention pain severity is given in Table 3.

Results also showed that 3 patients in Group I and 1 patient in Group II were lost in the follow up as they did not report in the subsequent period.

DISCUSSION

Temporomandibular disorders are the most common non-infective painful conditions of the maxillofacial region. Lipton et al⁹ reported that 8% of the

Table 1: Age Distribution

Age in years	Frequency	Percentage
15-25	18	36
26-35	19	38
36-45	9	18
46-55	4	8
Total	50	100

Table 2: Pre intervention comparison of Pain severity scores on VAS

Pain Intensity	Group I		Group II	
	n	%	n	%
No Pain	0	0	0	0
Mild	3	12	5	20
Moderate	9	36	10	40
Severe	13	52	10	40
Total	25	100	25	100

Table 3: Post intervention comparison of Pain severity scores on VAS (n=50)

Pain Intensity	Group I		Group II	
	n	%	n	%
No Pain	2	8	4	16
Mild	5	20	8	32
Moderate	7	28	9	36
Severe	8	32	3	12
Did not report	3	12	1	4
Total	25	100	25	100

interviewed individuals had TMJ or facial pain on more than one occasion in the preceding six months. They further documented that females are more aware of the symptoms as compared to male counterpart. Similar studies on the epidemiology of TMDs have shown that females, particularly in the second and third decades, may have more severe constitutional distress, which include headaches, joint and muscle tenderness, and joint clicking^{10,11}. These findings confirm the results of the present study showing that majority of patients were females in their second and fourth decade.

Pre intervention data of these patients showed that majority of the patients in the study sample reported with moderate to severe pain in both group I and group II. No single patient was shown to present with other signs and symptoms of TMDs other than pain. Aceves-Avila et al¹² supported these findings and

showed that the possibility of clinical presentation of TMD with click and other functional disturbance rather than pain is a rare finding. These patients are aware of clicking sound for a very long time but they usually do not report it. Similarly mild type pain is usually well tolerated by the patients and does not bother the patients in such a way to seek consultation.

In the present study, the effects of two different modalities of treatment for TMDs were investigated. The results suggest that both Analgesics and TENS are effective in reducing the severity of pain when used properly. Complete remission of pain occurred in 8% patients in group I as compared to 16% patients in group II. The results of study done by Carlson¹³ is almost in agreement to our findings showing that 10-15% patient can benefit completely with TENS therapy in TMD.

Jerjes et al¹⁴ in their review study on the controversies in the most commonly used treatment modalities, contradict the findings in our study. They showed that TENS alone has no significant effect on pain elimination while given without analgesics. This difference in findings may be attributed to the difference in sample size, technique of TENS application and the duration of therapy delivered to the patients.

A reduction in the pain severity in TMD can be achieved by various treatment modalities. TENS has a superior quality in reducing pain severity in a short period of time even with a low voltage setting^{4,5}. Twenty eight percent reduction in severe pain category was observed among TENS group in post intervention period as compared to a 20% reduction for the same category in analgesic group. Similar results were shown by ward and Lucas¹⁵. These findings also suggest that TENS is somehow superior to analgesics in reducing pain in TMD from severe intensity to mild and moderate categories. Mild to moderate type of pain can then be well controlled with low doses analgesics, ultra low voltage TENS or both thereafter.

CONCLUSION

The following can be concluded from the results of the present study:

1. TENS is superior in complete elimination of pain in a number of patients with TMDs and is a good alternative in patients with poor compli-

ance to medications or with poor gastro intestinal tolerance.

2. Superior results may be expected if TENS is applied to reduce the pain severity and then low doses analgesics are prescribed to eliminate mild to moderate types of pain.

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