

## Is there Any Role of Physiotherapy in Fothergill's Disease?

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### Abstract

**Background:** Fothergill's Disease (FD) also called as Trigeminal Neuralgia is characterized by paroxysmal attacks of severe, sharp, stabbing, electric shock like pain affecting one side of face mainly second and third divisions of it. FD is sometimes called "the worst pain known to mankind" and "the suicide disorder" by Medical Science. It is trigger by chewing, speaking, cold winds and touching trigger spot. Most of the time the patients with FD who showed partially or refractory responsive to drug therapy they underwent for surgery to relief the pain. Hardly any studies have reported the role of physiotherapy in Fothergill's Disease.

**Objective:** To find out the effect of physiotherapy management on pain in Fothergill's Disease.

**Design:** A Pilot Study.

**Setting:** Neuro-Physiotherapy Department, Pravara Rural Hospital, Loni (Bk) - 423 736, Maharashtra State, India.

**Participants:** Patients diagnosed with Fothergill's Disease.

**Interventions:** Transcutaneous Electrical Nerve Stimulation for 20 minutes, Relaxation Technique (deep breathing exercise) for 10 minutes, hot moist packs for trapezius muscles for 10 minutes, Isometric neck exercises for 5 repetitions on each side.

**Study duration:** Four weeks.

**Main outcome measure:** Visual Analog Scale (VAS) and Brief Pain Inventory-Facial an 18 item Questionnaire

**Result:** Pain was significantly reduce on VAS ( $p < 0.01$ ) and on Brief Pain Inventory- Facial ( $p < 0.01$ ).

**Conclusion:** The results of the study showed that using continuous TENS, Relaxation technique, hot moist pack over the trapezius muscles, Isometric neck exercise reduces pain in Fothergill's Disease. This pilot study emphasizes role of Physiotherapy in treatment of Fothergill's Disease.

**Keywords:** Fothergill's disease; Transcutaneous electric nerve stimulation; Visual analog scale; Brief pain inventory-facial

### Introduction

Fothergill's Disease (FD) has been referred in the medical literature for centuries. References to unilateral facial pain causing facial spasms can be seen in the writings of Aretaeus of Cappadocia in the 2<sup>nd</sup> century A.D. and those of the Arab physician Jujani in the 11<sup>th</sup> century A.D. The international Association for the study of pain defined Fothergill's Disease as "sudden, usually unilateral, severe, brief, stabbing, recurrent pains in the distribution of one or more branches of the fifth cranial nerve" (Merskey & Bogduk 1994). People often called it as "Tic douloureux, Trifacial neuralgia, or Trigeminal Neuralgia". Medical Science sometimes calls FD "the worst pain known to mankind and "the suicide disorder" because of the significant numbers of people taking their own lives when they cannot find effective treatments. The pain involves the second (maxillary) or third (mandible) divisions more often than the first (ophthalmic); it rarely occur bilaterally and never simultaneously on each side, occasionally more than one division is involved. Paroxysmal attack last for few seconds to minutes [1,2].

The diseases, typically involves older females aged more than 35 years and usually involves right half of the face. Chewing, speaking, washing the face, tooth brushing, cold winds or touching a specific 'trigger spot' e.g. upper lip or gum, may all precipitate an attack of pain. Its etiology is as much a mystery today; Periodontal diseases, traumatogenic occlusion, degeneration of nerves of deciduous teeth, circulatory insufficiency of trigeminal ganglion, multiple sclerosis, pressure of dilated and tortuous arteries in vicinity of trigeminal

ganglion or age related brain sagging, idiopathic have been blamed from time to time as causative factors [1,2].

According to practice parameters recommended by Quality Standards Subcommittee of the American Academy of Neurology and the European Federation of Neurological Societies, to control pain in patients with FD: carbamazepine should be offered, oxcarbazepine, baclofen, lamotrigine, and pimozide may be considered [3]. For patients with FD refractory to medical therapy: early surgical therapy, percutaneous procedures on the Gasserian ganglion, gamma knife, and microvascular decompression may be considered. All of these have their own positive and negative effect [4].

### Purpose

The rationale to carry out this study was that although pharmacotherapy and medical therapy may reduce intensity of pain in neuropathic disorders, its role in improving quality of life, emotional

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and physical functions is less consistent. Use of drugs may have its own side effects because many of the patients with this case are older age, take other medications, and have comorbid illnesses. Therefore, physiotherapy treatment, a non-invasive approach may also play a crucial role in management of pain in FD.

## Materials and Methods

The present study was conducted on 5 (M:F=1:4) patients of FD with age being above 40 years, referred to the Neuro-Physiotherapy Department from the department of ENT and Dental over a period of one year. Their MRI report, Dental and Neurological examinations was normal. Patients on medical treatment and showing intolerance to drugs were included in the study. Written informed consent was obtained from all the participants.

In patients with FD: psychological and behavioral disturbances, fear, anxiety and depression are most commonly associated with pain. Most of the time patients are unaware about their conditions. Education about the anatomy of the affected body part and pathophysiology of pain will help to increase the patient's understanding of the nature of the problem, reduce anxiety and increase compliance with and participation in physical therapy treatment. Therefore, patient's education was done prior to the treatment [4,5].

The following aspects of treatment are central to the management of pain in FD:

### Passive modalities

Patients were treated with continuous Transcutaneous Electrical Nerve Stimulation (TENS) [GymnaUniphy Phyaaction Guidance E] 250 Hz with pulse of 120 u, for 20 minutes over the path of affected nerve for 5 days a week for 4 weeks. One electrode was placed just before the ear, the other one at the end of the respective nerve. However, placement was adapted to pain referral and to effectiveness whenever necessary [6-10].

### Active modalities - exercises

With severe and intractable pain, two source of impairment may be identified: a primary impairment, owing to documented organic pathology and secondary impairments resulting from physical and emotional consequences of painful experiences (like inactivity and general psycho-physiologic deconditioning). Deconditioning results in decreased muscle strength and endurance increased joint stiffness and postural strain. These impairments independently contribute to the perception of pain and inability to perform functional activities. In FD patients, because of severity of pain they may become so much conscious that neck movement is reduced gradually. Maintenance of constant posture leads to neck and trapezius muscle spasm, decrease muscles strength and neck mobility that was noticed in our patients [5]. Therefore, to reduce muscle spasm hot moist pack was applied on neck and trapezius muscle for 10 minutes, Isometric neck exercises for each side and free neck movements exercise (neck flexion, extension and side-flexion) for five repetitions was given.

### Elements of self- management techniques

Relaxation techniques, which included deep breathing exercise was performed for 10 minutes. Distraction technique like, patients were asked to involve in those activities, which they like to perform instead of sitting ideal to avoid thinking of pain situations. These activities were asked to repeat in their home [11,12].

## Desensitization programme

To reduce the hypersensitivity, patients were asked to cover the affected side face with soft cloth or with cotton pad for 15 minutes per day, which may help in promoting habituation of the nervous system to the constant afferent input [13].

## Advice

Patients were asked to avoid the use of cold water for drinking and washing their face, use of scarf to avoid exposure of the face to cold environment, avoid eating hard foods, chewing food from non-affected side [4].

## Outcome measures

**Visual analogue scale (VAS):** It was used to assess pain at the beginning of interventions and after the fourth weeks of interventions. It is a 0-10 rating scale where a score of zero indicated no pain, 1-3 mild pain, 4-6 moderate pain and 7-10 severe pain [14,15].

**Brief pain inventory (BPI) - Facial:** The BPI- Facial is a 3 factor, 18 items questionnaire that is commonly used to assess 2 factors of chronic pain: pain intensity and interference (that is, how pain interferes with the patient's general activity and function). The pain intensity factor is elucidated by questions about a patient's worst, least, average, and current level of pain. For the interference factor, the BPI includes items that assess how pain interferes with a patient's general activity, mood, walking ability, and normal work, relationships with other people, sleep, and enjoyment of life. These 7 interference items are referred to as "interference with general activities". The additional 7 facial interference items include eating a meal, touching one's face (including grooming), brushing or flossing one's teeth, smiling or laughing, talking, opening one's mouth widely, and eating hard foods such as apples. Its reliability and validity has been documented by various authors [16]. Pre and post interventional assessment of this scale was also used.

## Results

Statistical analysis was done by Graph Pad InStat (v 3.10) software. Various statistical measures such as Mean, Standard Deviation (SD) and test of significance such as Paired 't' test was utilized to analyze the data. The results were concluded to be statistically significant with  $p < 0.05$  and highly significant with  $p < 0.01$ . Paired 't' test was used to compare the difference in scores between the pre-interventional and post-interventional values within a single group. The result of VAS and Brief Pain Inventory-Facial scale depicts significant results as indicated by a decrease in the scores within four weeks of treatment (Table 1, Charts 1 and 2).

## Discussion

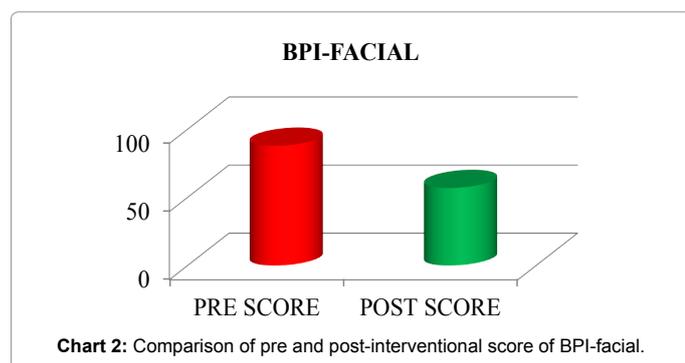
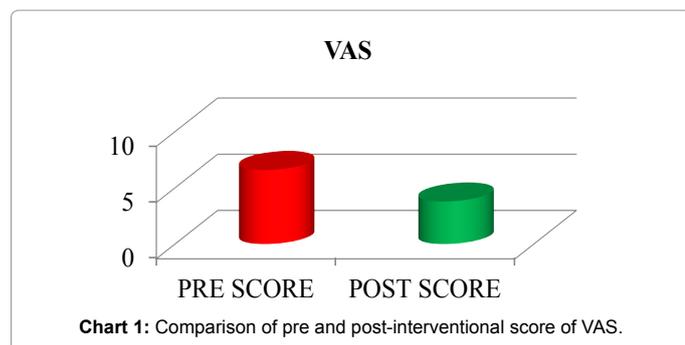
The result of this study showed significant decrease in the VAS score and BPI-Facial score after 4 week of intervention. The significant decrease in the VAS score may be because of the effect of TENS, which

	Outcome measures	
	VAS	Brief pain inventory-facial
Pre-interventional	6.6 ± 1.140 <sup>a</sup>	88 ± 9.274 <sup>a</sup>
Post-interventional	3.8 ± 0.836 <sup>a</sup>	57 ± 7.969 <sup>a</sup>
't' value	14.000 <sup>b</sup>	29.557 <sup>b</sup>
P value	<0.01	<0.01
Result	Highly significant	Highly significant

<sup>a</sup>Values expressed as mean ± standard deviation.

<sup>b</sup>Analyzed by Student's paired 't' test.

Table 1: Showing results of VAS and BPI-facial.



broadly works in two ways. Firstly, TENS uses soothing pulses that are sent via the pads through the skin and along the nerve fibers. The pulses suppress pain signal to the brain via pre-synaptic inhibition of noxious information in the afferent C fibers. This mechanism works based on gate control theory proposed by Melzack and Wall's. Secondly, it may also excite higher centers causing release of endogenous opioids that have descending inhibitory effect at the dorsal horn binding to receptors on nociceptive afferent neurons, so inhibiting the release of substance P [17]. Also Woolf et al. demonstrated that peripheral electrical stimulation could also excite naloxone dependent anti nociceptive mechanisms i.e. endogenous opioid systems operating both at spinal and supraspinal levels [5,18].

The significant decrease in the BIP- Facial Scale indicates that there was improvement in their functional activities, in quality of life, physical and emotional functions. The use of additional therapies such as application of hot moist pack in reducing the muscle spasm mainly involve the direct influence of heat on muscle spindles and on sensory nerve conduction. It decreases the neuronal activity of secondary endings, increases the activity of primary ending and Golgi tendon organ that produces a net inhibitory influence of motor neuron pool, breaking the vicious circle of pain-spasm-pain [5,19].

Relaxation technique (deep breathing exercise) and distraction technique may aid in reducing the pain, tension, depression and relaxes the muscles [20-22]. Isometric neck exercises may help to improve the endurance of neck muscles thereby reduces the effect of prolonged sustained neck posture in one position. The analgesic effects of exercise are generally attributed to the production of beta-endorphins during physical exercise [23].

Obvious limitations of this study included the research design itself in form of pilot study that limits generalization of the concepts to other individuals with similar problems and short-term follow up for only four weeks so it is recommended to perform similar studies with larger sample with long term follow up.

## Conclusion

The results of this study emphasize the role of physiotherapy in Fothergill's Disease as an educator, advisor, motivator, pain reliever and in decreasing the disability.

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