Direct and Indirect User Reported Benefits of Transcutaneous Electrical Nerve Stimulation for Chronic Musculoskeletal Pain

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Highlights:

- Experience of patients regarding TENS was evaluated
- TENS is helpful in relieving pain.
- It is helpful in reducing muscle spasm.
- It leads to less use of medication.

Abstract:

Transcutaneous electrical nerve stimulation (TENS) is one of feasible modalities being used. There may be several reasons for its use including its handiness and being favorite in physical therapists due to its cost effective aspect as well.

Objective:

To find patients' experience pattern regarding Transcutaneous Electrical Muscle Stimulation, as an effective modality.

Methodology:

Cross-sectional study consisting of 124 patients was conducted. Data were collected through a self generated questionnaire consisting of demographics and variables regarding usefulness of TENS. Data were analyzed in SPSS 20.0

Results:

A total of 124 individuals were recruited (40 males and 84 females). Results showed that TENS Outcome Frequency provides pain relief (71.8%), distraction from pain (76.6%), reduces sensation of muscle tension (77.4%), reduces muscle spasm (66.1%), leads to less use of medication (61.3%), enhanced feeling of rest and relaxation (73.4%), improved concentration on daily life tasks (25.8%), improves sleep (59.7%) ,it improves sitting (28.2%), improves standing (43.5%), improves walking (49.2%), improve participation in work (60.5%) and improves participation in social event in (63.7%).

Conclusions:

TENS is as well accepted modality among patients. The advantages that have been eported include improvement in pain, spasm, rsensation, rest, relaxation and participation in social life.

Keywords:

Transcutaneous electrical nerve stimulation, Physical Therapy, Patient Feedback.

Introduction:

Transcutaneous electrical nerve stimulation (TENS) is being investigated in terms of its efficacy, however, it is still debatable regarding its role in chronic musculoskeletal ailments including cervical pain, lumbago and so on. Effectiveness of TENS in acute pain, chronic cases and cancer pain has been recognized with non-compliance with treatment. The major reasons of non-compliance found to be insufficient stimulation, less time of its application and improper patient education. Even some experimental studies reported negative effects of TENS. These factors shows non-compliance of patients with TENS treatment.[1,3]

Use of analgesics in order to overcome pain in surgical and non-surgical have been a common practice, even today's advance emergency care providers have these sort of drugs available with them. Analgesics cannot be used in all circumstances; moreover, patient preferences have been shifted to non-pharmacological and non-surgical type of treatment. TENS is one of physical therapy based modalities, among similar other methods such as acupressure, mobilization and exercise therapy.[4,6]

Many aspects of TENS are debatable despite its widespread use in improving pain and spasm. This may be due to lack of consensus over its dosage, frequency, duration and mode of treatment for its application. There is also debate over provision of patient's preferred mode and intensity. While studing such population it's important not to miss multiple modes of treatment in order to generalize results. Despite these facts, there is limited literature regarding subjective self-evaluation of patients' feedback of TENS.[7-11]

A study was conducted to establish a patient based evidence regarding use and perception of TENS benefits. A number of systematic reviews have been conducted to find out TENS role in acute and chronic cases of pain such as arthritis, backache, neck pain, post amputation pain, neurological pain, neuropathic and cancerous pain.[6] These trials could not be declared decisive yet due to critique on their design, methodology, procedures or poor reporting concerns.[12] However, in a systematic review of multiple trials, TENS have been provably found better than that of placebo.[13] A systematic review conducted decades ago in years of the earliest trials on TENS, showed that TENS is helpful in reducing consumption of analgesics, if used properly i.e. right place, right dosage and duration.[5] These and other studies provide sample evidence regarding benefits of TENS.[7] But what do the patients understand and perceive about TENS benefits, was the question that has been address in current study.

Methodology:

It was a cross sectional study conducted in Pakistan Society for the Rehabilitation of the Disabled (PSRD). A sample of convenience consisting 124 patients who were regularly taking TENS from last 3-4 weeks, were surveyed through a structured questionnaire, while those of neurological disorders or with co-morbidities such as diabetes were excluded. The questionnaire that was used as data collection tool, consisted of demographics and outcome of TENS reported by patient aspects. demographics consisted of age, gender, educational level, employment, income, BMI, health status ,smoker or non-smoker and having arthritis or not. Data were collected by; hand-outs questionnaire. The data collected were printed as Excel Sheets arranged in set sequence as that of self generated questionnaire which was further entered and analyzed through statistical package of social sciences (SPSS 20.00). Frequency and percentages were extracted for categorical independent variables in data such as socioeconomic status, year of study, categorical responses.

Results:

There were 73 (58.9) high school graduates and 51 (41.1%) bachelor's degree holders. 83.9% (104) were married and 38.7% employed. Other characteristics suggested that 78 (62.9%) patients had body mass index 25-29.9 while 46 (37.1%) >30 (Figure 1) while 40 (32.3%) were smokers.

A self-perception regarding health status suggested that 42 (33.9%) were considering themselves good while 82 (66.1%) fair to poor in their health status while the arthritic patients were prevalent to number of 96 (77.4%). Most of the patients 73 (58.9%) were in age range of 40-49 years.

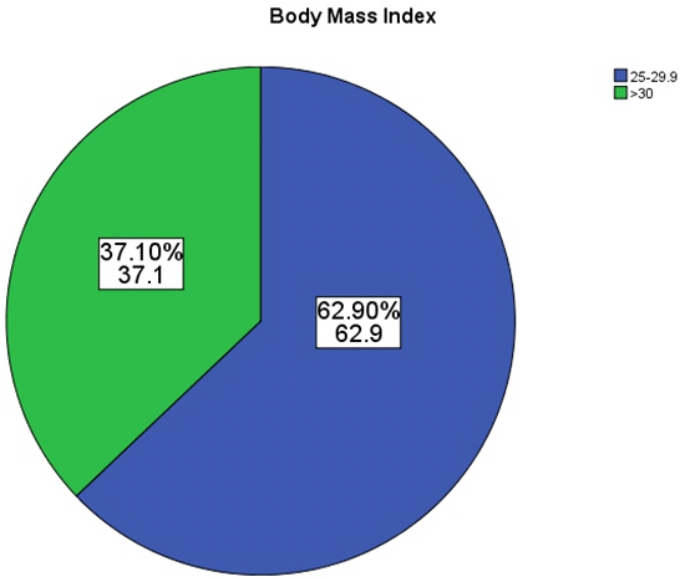

Figure 1: Distribution of participants according to BMI

Table 1 showed TENS Outcome Frequency Reported by patients that (71.8%) it provides pain relief (76.6%), distraction from pain (77.4%), reduces sensation of muscle tension (66.1%), reduces muscle spasm (61.3%), leads to less use of medication (73.4%), causes enhanced feeling of rest and relaxation (25.8%).

It leads to improved concentration on daily life tasks (59.7%), improves sleep (28.2%), improves sitting (43.5%), improves standing (49.2%), improves walking (60.5%), improves participation in work and improves participation in social events (63.7%).

Outcomes of Transcutaneous Electrical Nerve Stimulation reported by Patients		
Questions asked are given below	**No of Patients agreed**	**Percent (%) of Cases agreed**
TENS provides pain relief	89	71.8
TENS causes distraction from pain	95	76.6
TENS reduces sensation of muscle tension	96	77.4
TENS reduces muscle spasm	82	66.1
TENS leads to less use of medication	76	61.3
TENS causes enhanced feeling of rest and relaxation	91	73.4
TENS leads to improved concentration on daily life tasks	32	25.8
TENS improves sleep	74	59.7
TENS improvessitting	35	28.2
TENS improves standing	54	43.5
TENS improves walking	61	49.2
TENS improves participation in work	75	60.5
TENS improves participation in social event	79	63.7

Table 1: Patients' Reported Features of TENS

Discussion:

The female proportion was high in sample of study which shows a natural tendency patients seeking physical therapy all around the clinical practice. Arthritis is a degenerative joint disease which is directly related to age and bone or cartilage health. Bone and cartilage heath has always been a challenge in women especially in older age after menopause following imbalance of hormones such as estrogen and testosterone. This is very likely that women are more in ratio in the studied population which was to focus arthritis patients.[13,14]

The feedback regarding TENS however, varies. The elements with highest agreement rate regarding TENS as beneficial modality were its role to reduce muscle spasm, muscle pain, distracting from painful stimuli and enhanced feeling rest and relaxation.[15] TENS has dual mechanism of work. It stimulates mechanoreceptors that blocks nociceptive stimuli at brain stem level. The vibrations also increase local circulation, so more blood efficiently washes wastes and loads the tissue with plenty nutrients like have been reported previously. All aforementioned feedback is supported by literature that shows evidence regarding reduction of pain and muscle relaxation as primary functions of TENS.[16] The impact of TENS to produce counter irritation work as distraction element. Counter irritation divert brain receptors from actual source of pain. The sensation produced by counter irritation is not as troubling as the actual pain be. So it provides a ground and time elapse in which the underlying problems actually goes off.[17]

Other parameters were also comprehensively positive. Reduction in medication is a ground fact that results due to reduction in pain and symptoms overall.[18]

Pain and discomfort would be indirectly affecting sleep. Improvement in sleep may result from improvement in pain and symptoms. Social participation can also be linked with improvement in pain and symptoms. Function of every sort is linked with physical well being. Surprisingly, when asked about TENS improves or does not improve, sitting and concentration;

the response was discouraging, while in same questionnaire respondents have reported that TENS can improve social participation. On the other hand, it is fact that any mechanism of TENS does not support the idea of role in improving concentration.[3,6,14]

In short, TENS has been reported useful in majority of said aspects. Females being majority patients is prominent limitation of this study. The equal participation of subjects would be more certain feedback. The level of certainty in question is due to gender based difference proven in research that debates that females follow institution even in medical and health cure. However, the response given by males is also no different. Therefore, it is a recommendation at the time, but results can be disseminated. Overall, the study suggest a valid and important role of TENS in reliving musculoskeletal, neurological and neuropathic pain.[19-21]

Conclusions:

Transcutaneous electrical nerve stimulation is well accepted modality among patients. The advantages that have been reported include improvement in pain, spasm, sensation, rest, relaxation and participation in social life.

Recommendations

The use of transcutaneous electrical nerve stimulator is not unknown and is followed extensively, yet this study comes with multiple patient feedback that can serve as a guide opening and new direction of usage. The patient reported in functional activities, increasing focus and relaxation is a sign that has not been well focused. This could lead to broadening scope of indications for use of this modality.

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