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THE EFFECT OF PERSONALITY IN RELIEF OF POST-OPERATIVE PAIN BY TRANSCUTANEOUS ELECTRIC NERVE STIMULATION

Electrotherapy

Devi Das Verma* MS (General Surgery), Assistant Professor, Department of Surgery, KM Medical College and Hospital, Sonkh Road, Mathura, Uttar Pradesh, India *Corresponding Author

Rohit Verma MD (Psychiatry), Assistant Professor, Department of Psychiatry, All India Institute of Medical Sciences, New Delhi

ABSTRACT

Introduction: Pain is a complex phenomenon involving psychological as well as physical dimensions. Management of pain in the post-operative period continues to be a significant problem in surgical practice. The current study evaluates the importance of personality traits in affecting pain relief achieved through use of transcutaneous electric nerve stimulation (TENS).

Method: This parallel group sham controlled study (n=106) assessed impact of TENS in providing pain relief in patients undergoing laparotomy. Personality assessment was conducted pre-operatively and assessed for impact on pain relief.

Result: TENS therapy was found to be effective in controlling post-operative pain in 94% participants. No correlation could be observed between type of personality traits and effectivity of TENS.

Conclusion: Use of TENS imparts an excellent relief of pain in the post-operative period unaffected by personality traits.

KEYWORDS

TENS, pain, personality, electric.

INTRODUCTION

Pain is conceptualized as multidimensional with not only sensory but also cognitive, affective, and social components.[1] Research findings suggest that pain sufferers display elevated levels of anxiety and depression, interpersonal issues and personality disorders.[2,3,4] Personality traits are 'enduring patterns of perceiving, relating to, and thinking about the environment and oneself that are displayed in a wide range of social and personal contexts'.[5] Personality traits may be important to the understanding and treatment of pain, as they may be implicated in the development and adjustment to pain.[6]

The pain in the post-operative period and its management continues to be a significant problem in surgical practice. A number of factors including age, operative techniques, personality of the patient, physical status, site of operation and tissue affected are responsible for post-operative pain. Management of post-operative pain is mostly done using analgesics, narcotics and related medications that have inherent side-effects. Regional analgesia offers an effective alternative to use of medications but requires the presence of skilled medical personnel. The use of transcutaneous electric nerve stimulation (TENS) can achieve pain reduction by selective stimulation of nerve fibers without the constrains offered by previous other methods.

AIM

To assess the effect of personality in alleviating post-operative pain by application of TENS.

MATERIALS AND METHODS

Sample selection

This clinical study was conducted on 106 in-patients undergoing planned or emergency laparotomy for various abdominal pathology admitted under Department of Surgery at a tertiary care hospital in north India. The details of the study population and methodology is provided in a previous article.[7] A continuously generating monophasic square pulses (high frequency, low intensity) TENS device was used.

Outcome measures

Participants were assessed and details of socio-demographic and clinical variables were recorded. An assessment of personality was carried out using Maudsley's Personality Inventory. Observations were made on subjective reduction of pain and any complications. Pain relief was categorized as effective (good response) when no analgesics were required with no complaints of pain post-operatively, partially effective (fair response) when two or fewer analgesic doses were required with mildly tolerable pain and as ineffective (poor response) when more than two doses were required along with complaints of intolerable pain by the participant. A subjective pain assessment for tolerability was also conducted on a Likert scale (1-unbearable pain to 5-no pain at all).

RESULTS

There was no difference in the socio-demographic parameters among the groups. A detailed analysis of the study participant has been provided in Tables 1 & 2 and in a previous article.[7]

TENS response in relation to post-operative pain was found to be effective in 82%, partially effective in 12% and not effective in 6% participants. TENS was observed to be more effective in operations of resection and anastomosis of intestine & pyelolithotomy (100%) and cholecystectomy (88.88%). In this study, 4% participants were refractory and 2% were intolerant to the application of TENS.

Table 1: Effectivity of TENS in relation to socio-demographic & clinical variables in active group (n=50)

Parameter		Active group %	Pain reduction		
			Effective %	Partial %	Not effective %
Age group (years)	10-19	2	100	-	-
	20-29	14	71.42	14.28	14.28
	30-39	22	81.81	9.09	9.09
	40-49	26	76.92	23.07	-
	50-59	14	85.71	12.29	-
	60-69	14	85.71	-	14.29
	>70	8	100	-	-
Background	Rural	40	85	15	-
	Urban	60	80	10	10
Type of incision	Muscle cutting	34	82.35	11.76	5.88
	Muscle splitting	66	81.81	12.12	6.06
Length of incision (in cm)	10-12	10	100	-	-
	13-15	22	81.81	18.18	-
	16-18	36	88.88	5.55	5.55
	19-21	32	68.75	18.75	12.5
TENS Amplitude (in volts)	40-49	38	89.47	5.26	2.25
	50-59	30	80	10	10
	60-69	20	80	10	10
	70-79	4	100	-	-
	>80	8	50	50	-
TENS frequency (in hz)	20-39	50	80	8	4
	40-59	40	75	15	10
	60-89	8	75	25	-
	>90	2	100	-	-

Table 2: Personality & psychosomatic correlates of TENS effectivity in active group (n=50)

		Total %	TENS effectivity		
			Effective %	Partial %	Not effective %
Type of personality traits	Extrovert	46	82.60	13.05	4.35
	Introvert	54	81.48	11.11	7.41
Personality types	Depressive	12	50	33.33	16.66
	Hysterical	-	-	-	-
	Anxiety neurosis	4	100	-	-
	Obsessive	64	87.5	6.25	6.25
	No psychosomatic illness	20	80	20	-

No definite correlation could be made between placebo and active groups. This could be due to the small sample size. Few participants also had pleasant experience on TENS application and requested to continue the device till discharge.

DISCUSSION

In this parallel group sham controlled study, TENS therapy was found to be effective in controlling post-operative pain in 82% (no analgesic medication required) and partially effective in 12% (<2 analgesic injections required). Thus, providing an overall success rate of 94%. These participants were happy and satisfied with the device and did not demand for more analgesics.

TENS therapy is widely acceptable for pain relief. The effective pain alleviation provided by TENS can be hypothetically explained by gate control theory of abolishing the local pain reflex arc or endogenous opioid theory.[8,9,10] The good response to continuous TENS application has also been reported by other authors.[11,12,13]

The absence of difference between active and placebo group could be attributable to small sample size in the latter group. The placebo effect is reported to occur in approximately 1/3rd of individuals.[14] The effectiveness of placebo apparently is a direct function of pain severity, stress and anxiety.[15]

No correlation could be observed between type of personality and effectivity of TENS. Early research by psychodynamic theorists focused on personality as a causal factor for chronic pain which proposed the notion of a 'pain-prone' patient. These psychodynamic perspectives were important because they suggested that psychological and personality factors played a role in chronic pain. However, the evidence for a 'pain-prone patient' was criticized as being unconvincing, based on anecdotal accounts, and possessing rudimentary scientific methods.[16] In contrast the psychodynamic approach, trait theorists attempted to find objective and scientifically measurable, personality traits in pain sufferers.[17]

Compared to rates in the general and even psychiatric population, the prevalence of personality disorders in chronic pain populations is higher, ranging from 31% to 59%.[18] While some have argued that certain personality disorders may pre-dispose individuals to develop chronic pain, others have suggested that a stress diathesis model may explain the higher incidence of personality disorders in the chronic pain population.[19]

TENS application successfully reduced post-operative ileus probably owing to its sympatholytic effect. Thus, TENS reduces morbidity and makes convalescence comfortable. Pulmonary complications were less in TENS group as compared to control group. Also, it reduced the intake of narcotic analgesic and sedative agents. No other general, dermatological or systemic complications were observed. Sedative like effects were observed in few participants, probably due to relief in pain and reverted to normal sleep pattern. Other explanation could be attributed to the sedative like effects of TENS due to liberation of endogenous opioids.[10]

CONCLUSION

TENS is a non-invasive, drug sparing, convenient to use, portable device that is safe and virtually free from the menacing side effects associated with narcotic analgesics. We conclude that TENS might not replace the conventional analgesics but has definite adjuvant role in decreasing pain scores and improves sense of well-being after abdominal surgery. Personality traits did not affect the pain relief effectivity of TENS.

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