

Long term use of transcutaneous electrical nerve stimulation at Newcastle Pain Relief Clinic

M I Johnson BSc **C H Ashton** FRCP **J W Thompson** FRCP *Clinical Psychopharmacology Unit, Department of Pharmacological Sciences, University of Newcastle upon Tyne Medical School, Framlington Place, Newcastle upon Tyne NE2 4HH*

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Summary

This retrospective study of long-term use of transcutaneous electrical nerve stimulation (TENS) at Newcastle Pain Relief Clinic indicates that TENS has been a successful analgesic treatment for 58.6% of 1582 patients attending the clinic over a period of 10 years. A wide range of pain conditions were found to respond to TENS and many patients continued to use the treatment for several years. Most patients not responding to TENS (during a home trial) returned stimulators at the first follow-up appointment. Thus TENS should be considered as a simple, safe and reusable first line treatment for many pain conditions.

Introduction

Transcutaneous electrical nerve stimulation (TENS) is a simple, non-invasive analgesic technique currently used in clinics worldwide for the treatment of both acute and chronic pain. Although the short-term effectiveness of this treatment has been amply demonstrated¹, its value is still questioned² and information on long-term clinical efficacy is limited. A number of patients discontinue TENS treatment within the first 3 months although the exact proportion of such patients is unknown. The aim of this study was to assess long term efficacy of TENS in a heterogeneous population of chronic pain patients by examining administrative records of stimulators issued on loan by Newcastle Pain Relief Clinic (NPRC) over a 10 year period.

Methods

Records containing names and addresses of patients, and the date of issue and return of stimulating units up to 1 January 1991 were examined. All patients had

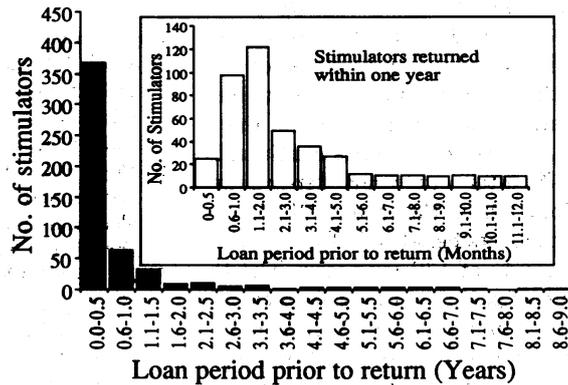


Figure 2. Duration of loan for stimulators returned to the clinic (n=523). Inset: Breakdown of the duration of loan in patients returning stimulators within the first year

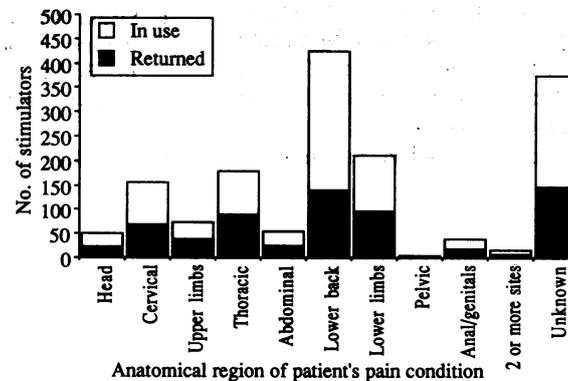


Figure 3. The number of stimulators issued to patients classified according to the anatomical region of the patient's pain (n=1582)

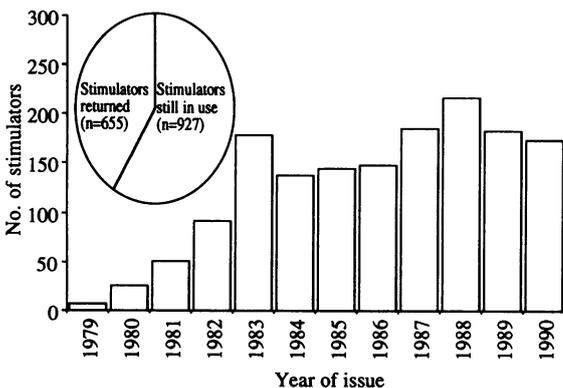


Figure 1. The number of stimulators issued by Newcastle Pain Relief Clinic per year. Pie chart shows the number of patients still in possession of a stimulator

attended a follow-up appointment. Patients were classified from the records according to anatomic region as described by the International Association for the Study of Pain Classification of Chronic Pain Conditions.

Results

The first stimulator, a Stimtech EP, was issued in October 1979. Since then, 1582 patients have received stimulators; 655 (41.4%) of these patients have returned the stimulator and 927 (58.6%) continue to use TENS. The clinic has progressively increased the use of TENS and over the last 5 years approximately 180 stimulators have been issued each year (Figure 1).

Of the 655 patients who returned stimulators, the majority of patients (368) did so within the first 6 months, usually during their first follow-up

appointment (Figure 2). The dates of return of 132 stimulators were not recorded. Only a small proportion of patients returned stimulators after the first year. Of patients still in possession of stimulators, 28 have used TENS successfully for over 10 years. A wide range of pain conditions have been treated with TENS and the distribution of pain conditions treated reflect the distribution of complaints presenting at the clinic. Figure 3 shows that no particular condition responded better than another, and over 50% of patients continue to use stimulators in most groups. Of note is the large proportion of lower back problems of which 67% of patients given a trial of TENS continue to use stimulators.

Discussion

This study indicates that TENS has been a successful analgesic technique for 58.6% of 1582 patients attending a Pain Relief Clinic over a period of 10 years, and many of these patients continue to use TENS for several years. Eriksson *et al.*³ found that varying proportions (18–60%) of patients continued to benefit from TENS after one year, depending on the pain condition, while Bates and Nathan⁴ reported that 27% of patients benefited after a year. Johnson *et al.*⁵, in a study of 179 long-term TENS users with a wide range of pain conditions, found that TENS reduced subjective pain rating by half or more in 47%, and 15.5% reported complete relief of pain. There was no relationship between the cause or site of pain and analgesic efficacy. However, other reports indicate that pains of neurogenic origin are more likely to respond to TENS than visceral or psychogenic pain¹.

It was not possible in the present investigation to assess the degree of pain relief obtained by patients continuing with TENS treatment nor to confirm that all were using their stimulators regularly. However, the policy in the clinic was to stress that stimulators should be returned if not being used so that they could

be issued to other patients. Most patients not responding to TENS returned their stimulators within the first 6 months; patients responding to TENS for over 6 months usually continued with treatment, a finding consistent with the report of Sjölund *et al.*⁶. Reasons for the few patients returning the stimulator after this time included resolution of the pain problem, simple forgetfulness, and possibly the development of tolerance to TENS analgesia.

In conclusion, TENS should be considered as a simple, safe and re-usable first line treatment for many pain conditions. It can be used long term with no risk of serious adverse effects⁵. It does not interfere with diagnosis of the primary cause of the pain nor interact with pharmacological or other treatments where these are indicated.

References

- 1 Woolf CJ. Segmental afferent fibre-induced analgesia: transcutaneous electrical nerve stimulation (TENS) and vibration. In: Wall PD, Melzack R, eds., *Textbook of pain*. Edinburgh: Churchill Livingstone, 1989:884–96
- 2 Deyo RA, Walsh NE, Martin DC, Schoenfeld LS, Ramamurthy S. A controlled trial of transcutaneous electrical nerve stimulation (TENS) and exercise for chronic low back pain. *N Engl J Med* 1990;**322**:1627–34
- 3 Eriksson MBE, Sjölund BH, Nielzén S. Long term results of peripheral conditioning stimulation as an analgesic measure in chronic pain. *Pain* 1979;**6**:335–47
- 4 Bates JAV, Nathan PW. Transcutaneous electrical nerve stimulation for chronic pain. *Anaesthesia* 1980;**35**: 817–22
- 5 Johnson MI, Ashton CH, Thompson JW. An in depth study of long term users of transcutaneous electrical nerve stimulation (TENS). Implications for clinical use of TENS. *Pain* 1991;**44**:221–9
- 6 Sjölund BH, Eriksson M, Loeser JD. Transcutaneous and implanted electric stimulation of peripheral nerves. In: Bonica JJ, ed. *The management of pain*, vol. 1. Philadelphia: Lea & Febiger, 1990:1852–61

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