

# Transcutaneous Electrical Nerve Stimulation (TENS) as a relief for dysmenorrhea

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*Summary:* Sixty-one women who suffered from primary dysmenorrhea, were treated with Transcutaneous Nerve Stimulation (TENS) for two menstrual cycles, and reported the effect of the treatment on their pain.

Thirty percent of the patients reported marked pain relief, 60% reported moderate pain relief and 10% reported that TENS had no influence on their pain. No side effects were reported.

We conclude that TENS is an effective and safe non-pharmacological means for the treatment of primary dysmenorrhea. It could serve as a main treatment modality for women who suffer from primary dysmenorrhea and do not wish to or cannot use the conservative pharmacological agents. In addition TENS can serve as an adjuvant therapy to the conventional pharmacological agent in severe cases of primary dysmenorrhea.

*Key word:* TENS; Primary Dysmenorrhea.

## INTRODUCTION

Primary dysmenorrhea affects as many as 50 of post-pubescent females (<sup>1, 2</sup>). Most of the women suffer only from mild to moderate form of dysmenorrhea but nevertheless a still significant portion of the population suffers from severe pain during the menstrual period leading to absenteeism from work for 1-2 days each month and to compromise of the entire daily schedule.

The biochemical basis for explaining pain during menstruation is the overproduction and release of prostaglandins by the endometrium. The prostaglandins cause hypercontractility leading to ischemia of the myometrium (<sup>3</sup>).

The use of prostaglandin synthetase inhibitors is an effective way of controlling pain in affected women, but unfortunately these drugs cause side effects in the elementary, renal as well as in other systems of the human body (<sup>4</sup>).

Those women who suffer severely during the menstrual period and who do not want to take medication or who cannot take medication due to side effects might benefit from the use of the non-pharmacological device, the TENS. In addition the TENS can serve as an adjuvant mode of treatment to the pharmacological agents in dysmenorrhea.

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## MATERIALS AND METHODS

Sixty one women with primary dysmenorrhea, diagnosed according to well-defined criteria (5) were included in this study.

All the women experienced regular menstrual cycles and none were using oral contraceptives. All the women were nulliparous and had at least a college education.

The women were asked to record on a scale of 1-10, the pain suffered as a result of dysmenorrhea in two cycles.

Then they were instructed to use the TENS independently, for another two cycles, and to record the impact of the TENS on their pain. No other medication or other methods of pain relief were used besides TENS.

Reduction in the pain scale greater than 5 points consider marked pain relief, 3-4 points consider moderate pain relief and less than 2 points consider no improvement. The TENS device generates 100 pulses per second with an amplitude of maximum 50 V and a pulse width of 95 microseconds.

The electrodes were placed in a triangular shape in which the negative electrodes were each placed about 5 cm laterally to the mid line in the umbilical level, which is the level of the T-10 to T-11 dermatomes. The positive electrode was placed on the mid line above the symphysis pubis, which is the level of T-12 dermatome.

This triangular shaped zone of stimulation by the TENS covers the dermatomes, which are innervated by the same nerve root serving the uterine sensory fibers.

## RESULTS

Sixty one women used the TENS for two cycles.

Before starting the use of the TENS, 34.5% of the subjects reported severe pain during menstruation, 57.4% reported moderate pain and 8.1% reported mild pain (table 1).

Table 1.

# of patients (total 61)	%	Level of pain	Pain scale
5	8.1	Mild	1- 3
35	57.4	Moderate	4- 7
21	34.5	Severe	8-10

The distribution of the pain was as follows: in 45.9% in the area of the abdomen, in 21.3% of the subjects in the back and in 32.2% of the subjects in both.

In the two non TENS treated cycles, 78.8% of the women had used oral medication when they had pain (usually NSAID), 14.8% had to rest during the menstrual period, due to severe pain, and 6.4% did not need any treatment or rest.

After using the TENS for two cycles, 59% of the women reported a moderate relief of dysmenorrhea and 31.2% reported a marked relief of complaints. Ten percent reported on no influence of the TENS on their pain (table 2).

Table 2. — The reaction to the TENS treatment.

# of patients	%	
19	31.2	Marked
36	59	Moderate
6	9.8	Mild-None

None of the users of the TENS reported any side effects during the TENS treatment.

The main advantages of TENS, as stated by the women in this study, were:

- 1) A relatively quick analgesic effect as compared to other methods of analgesia, e.g. rest, NSAID (32%).
- 2) The analgesia is achieved by using a non-pharmacological agent (54%).
- 3) Other reasons (14%).

## DISCUSSION

TENS has been extensively used in recent years for relief of a variety of pain syndromes. Although it has been known that TENS can effectively suppress pain, this method appears not to have been widely used in clinical daily practice for the treatment of dysmenorrhea.

In this study we demonstrated the efficiency of TENS in relieving primary dysmenorrhea in 90% of the women in this study. The positive influence of TENS on dysmenorrhea is much higher than that which could be attributed to the placebo effect. Studies testing the placebo effect have found a success rate of only 16% <sup>(6)</sup> to 33% <sup>(7)</sup> success in relieving dysmenorrhea. In addition to its efficiency, 32% of the women stated that the TENS worked faster than the conventional oral medication e.g. NSAID, which had been used in previous cycles and none of the women had any side effect result from the treatment by the TENS. The analgesia that is induced by the TENS can be explained by one of three theories:

A) the «gate control» theory.

B) The «endorphin mediated pain relief» theory.

C) The «diffuse noxious inhibitory controls» theory.

According to the «gate control» theory large diameter «A» nerve fibers are being stimulated in specific dermatomes, a blockade or «gating effect» is established at the dorsal horn level of the spinal cord blocking the transmission of pain impulse further to the upper nervous system <sup>(8)</sup>.

Support for this theory is provided by Golding and his colleagues <sup>(9)</sup> by demonstrating that TENS decreased early and late somatosensory-evoked potential amplitudes and stimulus intensity ratings and elevated the sensory detection threshold.

According to these Authors the TENS produces its effect by modulation at the level of the spinal cord or even in the upper parts of the central nervous system (subcortical, cortical) and not at the peripheral level.

The endorphin-mediated pain relief theory is based upon the fact that sti-

mus outside the central nervous system (like pain, physical effort etc.) can increase the level of endogenous endorphins resulting in a potent analgesic effect. This mechanism of analgesia can be countered by naloxone (an antiopiate drug).

Sjolund and Ericksson <sup>(10)</sup> reported that by low frequency electrical stimulation there was increased release of endogenous endorphins resulting in a potent analgesic effect. In addition Lundberg demonstrated in his study that dysmenorrheic pain can be attenuated by low frequency TENS and the analgesia was counteracted by naloxone in four out of six patients <sup>(7)</sup>.

In the «diffuse noxious inhibitory controls» theory, response of small diameter afferent fiber groups, evoked through continuous pain input to convergent dorsal horn neurons, are suppressed effectively by noxious or intense cutaneous stimulation such as with TENS, but not by non-noxious stimuli <sup>(11)</sup>.

Although it seems that TENS has an effective analgesic effect on dysmenorrhea without side effects, its use in the general population is still limited. Some of the reasons for this (among others) are the availability of the TENS and the psychological problem of the need to carry an «electrical instrument».

These problems can easily be overcome by educating the population and making the TENS more readily available to the population at large.

In this study we have demonstrated the effectiveness of TENS in treating dysmenorrhea. The TENS can be used by patients who do not want to take chemical medication or cannot use it because of its side effects. Moreover, the TENS can serve as an adjuvant non-pharmacological agent to the regular pharmacological medication in treating severe dysmenorrhea resistant to the usual treatment.

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