Transcutaneous electrical nerve stimulation (TENS) for adjuvant pain-relief during labor and delivery.

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Kaplan B, **Rabinerson D**, **Lurie S**, **Bar J**, **Krieser UR**, **Neri A**.

Department of Obstetrics and Gynecology, Rabin Medical Center, Beilinson Campus Petach Tiqva, Israel.

Abstract

OBJECTIVE: We examined the efficacy of transcutaneous electrical nerve stimulation (TENS) in general and the new Freemom TENS device (LifeCare, Israel) in particular, for pain relief during labor and delivery. METHODS: The study group consisted of 104 women. Forty-six nulliparas (44.2%) and 58 multiparas (55.8%), all of whom used the TENS device for pain relief during labor. All participants completed a questionnaire on the degree of pain relief afforded them by TENS during the delivery and related questions. The objective evaluation was based on the documented labor and delivery parameters including medical interventions during delivery. RESULTS: The majority of subjects (72% of the nulliparas and 69% of the multiparas) considered TENS effective for the relief of pain during labor. Most of them (67% of the nulliparas and 60% of the multiparas) responded positively to the use of TENS in future deliveries. Sixty-five percent of the multiparas considered TENS at least as effective as the other pain relief methods they had used before. TENS significantly reduced the duration of the first stage of labor $P < 0.001$ for nulliparas, $P < 0.005$ for multiparas and it significantly decreased the amount of analgesics administered to individual patients. No significant difference was found in fetal heart rate tracings, Apgar scores and cord blood pH between the study group and an equal number of matched controls who used other forms of pain management. CONCLUSIONS: TENS is an effective non-pharmacological, non-invasive adjuvant pain relief modality for use in labor and delivery. TENS application reduced the duration of the first stage of labor and the amount of analgesic drug administered. There were no adverse effects on mothers or newborns.

Pain relief in labour by transcutaneous electrical nerve stimulation (TENS)

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J.T. van der Spank[1], D. C. Cambier[1], H.M.C. De Paepe[1], L. A. G. Danneels[1], E. E. Witvrouw[1], L. Beerens[1]

[1]Department of Rehabilitation Sciences and Physiotherapy, Ghent University, Faculty of Medicine & Health Sciences, University Hospital 2B3, De Pintelaan 185, B-9000 Ghent e-mail: Dirk.Cambier@rug. ac.be

Abstract

For several years Transcutaneous Electrical Nerve Stimulation (TENS) has been used in the management of chronic and acute pain. The aim of this trial was to determine its effectiveness in providing pain relief during labour as well as its influence on the incidence of requests for epidural analgesia. The experimental group (receiving TENS by a burst - conventional obstetric TENS-apparatus) and the control population (not receiving TENS) consisted of 24 and 35 women respectively. In the experimental group the TENS application was switched off for a period of 15 min. The 24 women were asked to point out the intensity of their pain on a visual analogue scale before, during and after this temporary interruption. Two days postpartum the parturient's satisfaction was evaluated by two questions, a procedure which revealed that 96% degree of satisfaction. The incidence of epidural analgesia in the experimental group was compared to the control-group. During TENS application the pain scores were significantly lower ($p<0.0001$), but no statistically significant difference in incidence of epidural analgesia was found between the experimental group and the control group

Transcutaneous electrical nerve stimulation (TENS) as a pain-relief device in obstetrics and gynecology.

Clin Exp Obstet Gynecol. 1997;24(3):123-6

Kaplan B**,** Rabinerson D**,** Pardo J**,** Krieser RU**,** Neri A**.**

Department of Obstetrics and Gynecology, Rabin Medical Center, Petah Tikva, Israel.

Abstract

Transcutaneous electrical nerve stimulation (TENS) is a non-pharmacological and non-invasive pain-relief method that has been proven effective for a variety of conditions. Electrical therapy has been recognized for a long time but its practical clinical application in the form of TENS has been evaluated only during the last 30 years as a result of several theories on pain. The most known of these with regard to TENS development is the "gate theory", although several others have also played a role. In obstetrics and gynecology, TENS has been found to be effective in alleviating labor pain and in the treatment of primary dysmenorrhea. It has also been used successfully following obstetric and gynecologic surgery. In order to be effective in clinical use for obstetric and gynecologic indications, a TENS device must have certain properties, which are detailed in this review. Although new TENS devices that meet all the necessary requirements have been developed and tested, their use is still far from widespread. Patients and medical staff should be encouraged to try the TENS device for obstetric and gynecologic indications, since it is non-invasive, efficient, and easy to use.

Effectiveness of transcutaneous electric nerve stimulator for pain relief in labour.

Asia Oceania J Obstet Gynaecol. 1990 Jun;16(2):145-51

Chia YT, **Arulkumaran S**, **Chua S**, **Ratnam SS**.

Department of Obstetrics and Gynaecology, National University Hospital, Singapore.

Abstract

The effectiveness of transcutaneous electric nerve stimulation (TENS) for pain relief in labour was compared to inhalation analgesia consisting of 50% nitrous oxide and 50% oxygen (ENTONOX). In the first part of the study 101 patients in early labour were allocated to using TENS (Group A) or ENTONOX (Group B) for pain relief. Our results did not show any beneficial effect on pain relief in labour with the use of TENS over ENTONOX; 18.8% of patients in Group A went through labour without any further form of analgesia as opposed to 17.0% in Group B. In the second part of the study 20 nulliparous patients having induced labour were randomly allocated to use TENS (Group C) or ENTONOX (Group D) as the first modality of pain relief. A switchover was made when labour pains were no longer tolerable. The results showed that both TENS and ENTONOX could be used in early labour up to 5-6 cm cervical dilatation till the frequency of contractions was nearly 5 in 10 min or the first 3-4 hr from the time patients first requested pain relief in labour when frequency of contractions was nearly 4 in 10 min. TENS could be used in early labour for patients who wish to be ambulant and is as effective as ENTONOX. Either modality of pain relief was not adequate for pain relief throughout labour.

Analgesia in labour: a review of the TENS method.

Prof Care Mother Child. 1994 Mar;4(2):50-2

Cluett E.

Abstract

Transcutaneous electrical nerve stimulation (TENS) applies controlled mild electrical stimulation to the skin by means of electrodes. Stimulating peripheral nerve endings in this

way seems to inhibit the transmission of painful impulses at the dorsal horn of the spinal column, and/or activate some of the descending pain-inhibitory systems above the spine. TENS may also stimulate the body to produce natural endorphins and enkephalins, morphine-like substances which have an analgesic effect. TENS has been successfully used for the relief of short-term post-operative and post-traumatic pain and for chronic pain. Midwives are permitted to use TENS under their Code of Practice. There is no evidence that TENS causes any harm to mother and baby. Women seem to like using it in labour, perhaps partly because it is a method they themselves can control. This may confer a psychological benefit which in turn may make pain seem more manageable. Research findings tend to support the effectiveness of TENS for pain relief but several of the studies suffer from methodological drawbacks. One study compared TENS with Entonox, pethidine and epidural anaesthesia. Results showed that TENS and Entonox were both effective and popular methods with women who had short labours and needed no other form of analgesia.

A randomized controlled trial of the efficacy of transcutaneous electrical nerve stimulation (TENS) versus lidocaine in the relief of episiotomy pain.

Philipp J Obstet Gynecol. 1999 Oct-Dec;23(4):135-42

Lorenzana FD.

Abstract

The aim was to compare the efficacy of transcutaneous electrical nerve stimulation (TENS) and local infiltration of 2% lidocaine in the relief of episiotomy pain measured using a pain visual analog scale (VAS). A randomized, double blind, controlled clinical trial was conducted from January 1 to May 15, 1998, in the Labor-Delivery Complex of Chong Hua Hospital, Cebu City. Skin electrodes were attached to two acupoints. "Shenmen" on the wrist and "hegu" on the hand are acupoints for general pain relief and relaxation. These acupoints were stimulated using a nerve stimulator. Stimulation was started during advance labor and discontinued right after episiorrhaphy. VAS scores were taken during certain periods and compared with VAS scores for those using the conventional method of 2% lidocaine infiltration into the episiotomy site. There were 68 patients who met the inclusion criteria. 38 in the TENS group and 30 in the Control group. The patients profile of the two groups did not differ significantly in terms of age, age of gestation, parity, and length of episiotomy. Among those with VAS score of 5 (bearable), 37% was failed TENS, requiring rescue anesthesia. The proportion of patients with pain during episiotomy and 12 hours after episiorrhaphy showed no significant difference between the two groups. But during episiorrhaphy and 1 hour after episiorrhaphy, the TENS group was superior to the lidocaine group, with p-values of 0.05 (0.0392 and 0.0063, respectively) based on the Mann Whitney U-Test. Ambulation time was shorter in the TENS group. Episiotomy tenderness was nil in the TENS group. There was no swelling and edema in the perineum of patients in the TENS. The need for oral analgesics was likewise much lower in the TENS group. TENS as a form of anesthesia-analgesia cannot totally alleviate episiotomy pain as measured by VAS scoring system, with 37% as failed TENS. The study showed there was a difference only in pain relief during repair, and 1 hour after repair. With TENS being superior to lidocaine, ambulation time was shorter and episiotomy tenderness was nil in the TENS group. Likewise, lesser number of patients requested for oral analgesics in the TENS group.

Transcutaneous electrical nerve stimulation (TENS) in obstetrics

Zentralbl Gynakol. 1986;108(8):486-93. Article in German

Tischendorf D.

Abstract

Labour pains have been influenced by TENS (electrodes placed at Th10 to L2) in 78 women (control group comprising 46 women) during delivery. No electrostimulation of the sacral

segments was carried through. The two groups were comparable well because of similarities in their age, the babies' size at birth and equal conditions during delivery. The first TENS effect observed was a marked reduction of duration of labour with no increase in pathological cardiotocographic findings. With TENS applied, primiparae have been delivered after an average of 244 minutes (control group after 358 minutes) and multiparae after 159 minutes (control group after 256 minutes). 87 per cent of the TENS group's labour and 61 per cent of the control group's labour were induced. Using TENS, clearly reduced amounts of spasmolytic agents (44:74 per cent) had to be administered during labour. 41 per cent of the TENS group women suffered episiotomy or laceration (control group: 52 per cent). 80 per cent of the women in whom TENS had been applied considered TENS as facilitating childbirth. 68.4 per cent of the primipara TENS group (control group: 18.2 per cent) and 80 per cent of te multipara TENS group (control group: 25 per cent) indicated the labour pains to be absolutely endurable (with TENS applied, the labour pains did not start until about 15 minutes prior to delivery--lack of sacral electrodes?). However, the experience gathered as well as an assessment of the questionnaires filled in, indicate that, with all the technical equipment available, women in labour expect the medical staff to provide them with care, understanding and personal devotion.

Transcutaneous electric stimulation (TENS) to reduce pain after cesarean section

Ginecol Obstet Mex. 2000 Feb;68:60-3 Article in Spanish

Navarro Nunez C,

Pacheco Carrasco M.

Hospital General de Zona y Medicina Familiar Numero 1 del Instituto Mexicano del Seguro Social, Colima.

Abstract

The main goal of this work was to evaluate the efficacy of transcutaneous electrical nerve stimulation (n = 25), comparatively with the effects induced by the intravenous administration of 1 g of Dipyrone (n = 25), to reduce postoperative pain during the immediate period (4 hours) following cesarean section. We undertook a clinical study in order to analyze the following variables: pain intensity, duration of pain, and additional consumption of analgesic drugs. Our data showed that both treatments resulted insufficient in order to eliminate completely postoperative pain, requiring the administration of additional analgesic drugs. This study supports previous findings reporting that transcutaneous electrical nerve stimulation induces a decrement of 50% on the total amount of analgesic drugs employed. Transcutaneous electrical nerve stimulation showed to effectively reduce the intensity and duration of pain of cutaneous origin, as well as to reduce pain associated with voluntary movements, in all patients. Perhaps due to the blocking of A peripheral fibers (somatic pain). However, in 13 patients, this treatment was insufficient to block visceral pain conducted by type C peripheral fibers. These actions may be related to the position of the stimulus electrodes, as well as to the frequency of stimulation used in our study. Taken together, our results are indicative that transcutaneous electrical nerve stimulation constitutes an alternative treatment in order to reduce postoperative pain during the immediate period following cesarean birth; reduces the requirements of analgesic drugs; helps on keeping alert the mothers and therefore able to attend the newborn; and avoids secondary effects of analgesic drugs over mother-newborn relationship. Nevertheless, it is necessary to further explore transcutaneous electrical nerve stimulation, changing the position of the stimulus electrodes, and the frequency of stimulation, in order to evaluate its effects on visceral pain.

Transcutaneous electrical nerve stimulation after cesarean birth.

Phys Ther. 1986 Jan;66(1):36-8

Hollinger JL.

Abstract

The purpose of this study was to determine if women who had Cesarean birth experiences and used transcutaneous electrical nerve stimulation as a means of pain control requested less pain medication and had shorter hospital stays than those who did not use TENS. I reviewed the medical charts of 72 women (46 using TENS, 26 not using TENS) retrospectively. Significantly less (F = 5.77; df = 1,65; p less than .02) meperidine hydrochloride was administered to the women who used TENS. The length of hospital stay of women using TENS was not significantly different than those who did not use TENS. My findings suggest that the use of TENS after Cesarean birth may result in decreased usage of medication and, therefore, a reduction of the side effects of the medication both to the mother and the infant.

Transcutaneous nerve stimulation as a method of analgesia in labour.

Anaesthesia. 1979 Apr;34(4):361-4.

Stewart P.

Abstract

Transcutaneous Nerve Stimulation, which has been shown to be of value in certain painful conditions, has been used as a method of pain relief in labour. Of the 67 patients studied, 16 (23.5%) received considerable pain relief, 38 (55.9%) thought it was of some help, and five (7.4%) did not require any other form of analgesia. It is suggested that Transcutaneous Nerve Stimulation has a place in obstetric analgesia.

The effect of transcutaneous nerve stimulation on labor Geburtshilfe Frauenheilkd. 1978 Dec;38(12):1079-84

Kubista E, **Kucera H**, **Riss P**.

Abstract

The analgesic effect of transcutaneous electric nerve stimulation (TENS) during delivery has been studied. 57 (55.9%) of 102 women treated considered TENS had given them good or very good relief from pain; 24 (23.5%) reported that they had received some relief, while 21 patients (20.6%) were of the opinion that they were not helped by the technique. CTG monitoring ocurred in all cases. No side effects on the fetus or the mother have been noted. A positive aspect of TENS was the quick course of delivery and the absence of obstetrical complications in the cases treated with this method. Therefore the designation of TENS as a new, riskless, but effective technique for pain relief during childbirth seems justified.

Pain relief in labor by transcutaneous electrical nerve stimulation. Safety aspects.

Acta Obstet Gynecol Scand. 1982;61(1):1-5.

Bundsen P, **Ericson K**.

Abstract

A current density standard for current shapes used in transcutaneous electrical nerve stimulation (TENS) must be established in order to avoid harmful effects. This is especially important when stimulating near vital structures such as the fetal heart. In the absence of an applicable standard, a preliminary safety norm is proposed, based on clinical experience during delivery and experimental measurements in the female bladder. Current densities due to TENS not exceeding 0.5 microamperemeter/mm2 are safe for the fetal heart. A stimulator and electrodes fulfilling the safety criteria proposed in this study have been tested. A filter which suppresses the electrical disturbances occurring during TENS, thereby permitting recording of the fetal heart rate during birth, has also been tested. TENS was given over both the low-back

and suprapubic region. Results of clinical tests of the equipment during 15 supervised births are reported. No adverse effect in the mother or newborn infant were observed.

Transcutaneous electrical nerve stimulation at acupuncture points in the induction of uterine contractions.

Obstet Gynecol. 1989 Feb;73(2):286-90

Dunn PA, **Rogers D**, **Halford K**.

Physiotherapy Department, Moorabbin Hospital, Melbourne, Australia.

Abstract

The effectiveness of transcutaneous electrical stimulation at acupuncture points for increasing uterine contractions in 20 post-dates pregnant women was assessed in a controlled study. Subjects were randomly assigned to either a treatment condition, consisting of the application via surface electrodes of a 30-Hz current to the points "spleen 6" (lower leg) and "liver 3" (foot), or a placebo condition, in which the equipment was attached but not activated. The frequency and strength of uterine contractions were monitored for 1 hour prior to stimulation and then for the final 2 hours of a 4-hour test period. A significant increase in frequency and strength of uterine contractions was found in the electrically stimulated women compared with the placebo-group women. The possible physiologic mechanisms underlying this effect, and its implication for labor induction, are discussed.

Pain relief by applying transcutaneous electrical nerve stimulation (TENS) on acupuncture points during the first stage of labor: a randomized double-blind placebo-controlled trial.

Chao AS, Chao A, Wang TH, Chang YC, Peng HH, Chang SD, Chao A, Chang CJ, Lai CH, Wong AM.

Department of Obstetrics and Gynecology, Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Taoyuan, Taiwan.

Transcutaneous electrical nerve stimulation (TENS) is one of the non-pharmacological means of pain relief for labor and delivery. We aimed to investigate the efficacy and safety of TENS on specific acupuncture points for reducing pain in the first stage of labor. In this double-blind, placebo-controlled trial, we randomly assigned healthy full-term parturients in active phase of first-stage labor to either TENS on four acupuncture points (Hegu [Li 4] and Sanyinjiao [Sp 6]) (n=52) or the TENS placebo (n=53). Visual analogue scale (VAS) was used to assess pain before and 30 and 60 min after treatment. The primary outcome was the rate of VAS score decrease 3 in each group. A questionnaire was given at 24h post-partum to evaluate the satisfaction of pain relieving method and the willingness to have the same treatment again. Mode of delivery and neonatal effect were measured as secondary outcome. One hundred women were eligible for analysis. TENS group experienced VAS score reduction 3 significantly more common than the TENS placebo group (31/50 [62%] vs 7/50 [14%], P<0.001). Willingness of using the same analgesic method for a future childbirth was also significantly different (TENS: 48/50 [96%] vs TENS placebo: 33/50 [66%], P<0.001). Operative delivery was increased in the TENS group (12/50 [24%] vs 4/50 [8%], P=0.05), but the neonatal outcomes were not different. The application of TENS on specific acupuncture points could be a non-invasive adjunct for pain relief in the first stage of labor.