

Dental Forum 2020: The effect of transcutaneous electrical nerve stimulation on pain control and anxiety reduction during dental procedure in children 9-14 year's old - Nina Cebalo - University of Zagreb

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The aim of the study is to analyse the effectiveness of the Transcutaneous Electrical Nerve Stimulation on decreasing pain and anxiety during a dental procedure. The method of Transcutaneous Electrical Neurostimulation is based on the principle of Electroanalgesia, where stimulation of nerve fibers occurs. Stimulation of the A fibers blocks C fibers responsible for transmission of pain at higher levels of the nervous system. Transcutaneous Electrical Nerve Stimulator (TENS device) works on reduction of acute and chronic pain, stress, tension, poor circulation and fatigue. Similarly, it can be used to manage pain during various dental procedures, as well as pain due to various conditions affecting the maxillofacial region. It can also be used as a distraction or placebo mechanism in order to reduce stress and anxiety during dental procedures.

During the first visit patients will be classified based on dental status examine based on the need for restoration. Intervene on Class I on the first permanent molar and age between 9 and 14 years, patients will be randomly selected into three groups: 1) group A of 40 examinees, on whom there will be no anesthesia applied; 2) group B of 40 examinees, on whom the TENS device will be applied; 3) group C of 40 examinees who will receive local anesthesia. Anxiety levels will be measured on all three groups of patients before and after the procedure. Level of anxiety will be measured with the help of tests for anxiety and pain: ASI (Anxiety Sensitivity Index), Picture Scale of Self-assessment (Self-Assessment Manikin Scale), Norman Corah Dental Questionnaire, CFSS - DS (Children's Fear Survey Schedule - Dental Subscale), and Visual Analogue Scale (VAS).

The hypothesis is that local anesthesia will act as an analgesic in order to perform the procedure without pain and that the TENS device will act equally or less effectively on pain and anxiety in relation to local anesthesia. The expected result is that the TENS device will successfully achieve mild analgesia and act anxiolytic during the first visit. The assumption is that only one treatment with TENS advice will be enough in order to reduce anxiety. Expected scientific contribution is of

measuring stress levels with stress-quesonnaires in patients will give a broader view of connection and the impact of psychological stress on the manifestations of anxiety and pain control.

Pain has been unchanged tormentor of mankind since time immemorial. Techniques used to control pain are broadly divided into pharmacological and non-pharmacological methods. Most common pharmacological means to curb pain in dentistry is the use of local anesthesia during dental procedures and analgesics for the postoperative pain. Use of local anesthesia instills fear in many patients as it requires the use of the 'horrifying' syringe. A non-pharmacological method for pain control is the use of transcutaneous electrical nerve stimulation [TENS]. FDA [Food and Drug Administration] has approved TENS as a method of pain alleviation and classified it as class II device in 1972. During TENS therapy, pulsed electrical current is generated either by A.C. mains or using batteries [usually 9V] and delivered across the intact skin surface via electrodes to start superficial nerves for localized pain relief. TENS is commonly used by health professionals for acute and chronic pain management. In dentistry, though TENS has potential applications, it is not used that frequently. Hence, the purpose of this article is to review its applications in dentistry so as to raise awareness among dental fraternity regarding its dental applications. For review a search of "PubMed" was made with the keywords "TENS AND dentistry," "TENS AND trigeminal neuralgia," "TENS AND orofacial pain," "electronic dental anaesthesia." Also, after searching references of full text articles, relevant articles were included. For review, articles published in English language with no time limit were selected.

In conclusion, though TENS can't replace local anesthesia, it can be used for pain relief during various dental procedures. Its analgesic and non-analgesic physiologic effect can be used in the management of a variety of conditions affecting maxillofacial region.