

INPLASY

Biological and Cellular Effects of Percutaneous Electrolysis. A Systematic Review Protocol

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ADMINISTRATIVE INFORMATION

Support - N/A.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202490079

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 September 2024 and was last updated on 18 September 2024.

INTRODUCTION

Review question / Objective To evaluate the biological and cellular effects of percutaneous electrolysis and its influence on tissue healing processes.

Rationale Percutaneous electrolysis is a growing technique in physiotherapy. This technique consists in the introduction of an acupuncture needle, guided by ultrasound to the injured area. Upon reaching the target structure, a galvanic current is applied. There are some studies that talk about the cellular and biological effects of this technique, however, there is no consensus on what the effects are and under what situations. This systematic review aims to bring together the available evidence and above all to draw useful conclusions for the clinician.

Condition being studied The injuries of interest are the different structures of the musculoskeletal system. Because the available evidence is not

much, the aim of this review is to group the physiological effects by musculoskeletal structures such as tendons or muscles.

METHODS

Participant or population Any living organism (animals, cells or humans).

Intervention Percutaneous electrolysis through an acupuncture needle. This technique consists in the introduction of an acupuncture needle, guided by ultrasound to the injured area. Upon reaching the target structure, a galvanic current is applied.

Comparator No Intervention or Sham Intervention.

Study designs to be included - Clinical Trials; Case-Control Studies with Intervention; Quasi-experimental studies.

Eligibility criteria (1) Any study that performs post-intervention measurements with

percutaneous electrolysis (Clinical trials, case-control studies or quasi-experimental studies); (2) Any living organism (rats, mice, cells or humans); (3) Biological and cellular markers analysis; (4) English or Spanish language.

Information sources PubMed, Cochrane Library and Web of Science.

Main outcome(s) The number of applications (percutaneous electrolysis interventions) performed, the dose applied (time, intensity) in the different cellular and biological markers such as:

- Inflammatory markers
- Antiinflammatory markers
- Cell Death markers
- Proliferation Cell markers
- Extracellular matrix markers
- Tissue remodeling markers
- Metabolic Enzymes markers
- Transcription Factors markers.

Quality assessment / Risk of bias analysis For the analysis of animal studies, the SYRCLE risk of bias tool was used. This tool is based on the Cochrane Collaboration's tool for assessing risk of bias in randomized controlled trials and is related to 6 types of bias: selection bias, conduct bias, detection bias, attrition bias, reporting bias, and other sources of bias. Studies that perform interventions will be evaluated. For human studies, the Physiotherapy Evidence Database (PEDro) scale will be chosen (19).

Strategy of data synthesis Both a quantitative and narrative synthesis of the results is planned, depending on the heterogeneity of the included studies and the availability of comparable data. If enough homogeneous studies are found, a meta-analysis will be performed. Otherwise, we will proceed with a systematic review.

Subgroup analysis N/A.

Sensitivity analysis Sensitivity analyses will be performed excluding studies with high risk of bias or with significant missing data to assess the impact of these on the overall results.

Language restriction Articles in English, French or SpanishEnglish, spanish articles.

Country(ies) involved Spain.

Keywords Percutaneous Electrolysis; Cell Marker; Biological Effects; Invasive Physiotherapy; Healing Process.

Contributions of each author

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