INPLASY PROTOCOL

To cite: Quiroz et al. Efficacy and Efficiency in vitro, of chemo-mechanical caries removal against rotary system, in permanent teeth: A systematic review. Inplasy protocol 202320001. doi: 10.37766/inplasy2023.2.0001

Received: 01 February 2023

Published: 01 February 2023

Corresponding author:
Josselyn Quiroz

100005375@cientifica.edu.pe

Author Affiliation:
Universidad Científica del Sur.

Support: **Self financed.**

Review Stage at time of this submission: **Data analysis.**

Conflicts of interest:
None declared.

Efficacy and Efficiency in vitro, of chemo-mechanical caries removal against rotary system, in permanent teeth: A systematic review

Quiroz, JM[1]; Mungi, S[2].

Review question / Objective: **Systematic review based on the following PICOS question: P: Articles that have investigated permanent teeth; I: Articles that have investigated chemomechanical agents; C: Articles that have investigated rotary system; O: Articles that have obtained as a result, presence of bacterial colonies, microhardness, time; S: in vitro studies.**
Condition being studied: **To the best of our knowledge, this is the first systematic review that aimed to evaluate the in vitro Efficacy and Efficiency of chemomechanical caries removal against a rotary system in permanent teeth. In addition, these data can provide a new contribution for research.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 01 February 2023 and was last updated on 01 February 2023 (registration number INPLASY202320001).

INTRODUCTION

Review question / Objective: **Systematic review based on the following PICOS question: P: Articles that have investigated permanent teeth; I: Articles that have investigated chemomechanical agents; C: Articles that have investigated rotary system; O: Articles that have obtained as a result, presence of bacterial colonies, microhardness, time; S: in vitro studies.**

Rationale: **This investigation has theoretical importance because we will be able to know the effectiveness and efficiency of the mechanical chemical agents against the rotary system in the permanent dentition; it also has clinical importance because we will know different protocols to use chemical removers and be able to use them in clinical practice.**

Condition being studied: To the best of our knowledge, this is the first systematic review that aimed to evaluate the in vitro Efficacy and Efficiency of chemo-mechanical caries removal against a rotary system

METHODS

Search strategy: Individual search strategies were used for each database and combinations of search terms, including MeSH, Boolean (AND/OR) and truncator (*) operators. These search strategies were applied in descriptive tables for a better understanding of the reader.

Participant or population: Articles that have investigated the use of permanent teeth with carious lesions.

Intervention: Articles that have investigated chemomechanical agents.

Comparator: Articles that have investigated Rotary System.

Study designs to be included: In vitro studies.

Eligibility criteria: Inclusion criteria were in vitro studies that included efficacy and efficiency in permanent teeth, in vitro studies in which caries removal is chemomechanical agents or rotary system in extracted teeth analyzed in the laboratory, studies related to conventional and unconventional methods in teeth extracted permanent teeth with carious lesions and extracted permanent teeth without carious lesions in full PDF file. Exclusion criteria were randomized and non-randomized clinical trials, case reports or series, preclinical studies, animal studies, in vivo studies, randomized and non-randomized clinical trials, letters to the editor, reviews of the literature and systematic review, and studies that did not comply with inclusion criteria.

Information sources: Five online databases were used to search relevant literature: MEDLINE via PubMed, EBSCO, Science Direct, LILACS and Scopus as well as gray literature (Google Scholar) and specific journals on the subject.

Main outcome(s): The efficiency will be evaluated through studies where they have compared the complete removal of caries of one group over another, with a chronometer and evaluate which of the methods is more efficient. The efficacy will be evaluated through histological studies using a microscope to determine which group has a greater presence of bacterial colonies and for the microhardness analysis it will be evaluated with a microhardness testing machine.

Data management: The search was carried out by two researchers (Quiroz. JM - Mungi. S) independently at the time of filtering the articles and when there was doubts among the researchers, a third observer had the final vote.

Quality assessment / Risk of bias analysis: The research group was trained and calibrated in the use of the tools to be able to assess the risk of bias with different articles from those selected for the research. The tool that was used for the evaluation of the methodological quality of each in vitro study, used was the checklist for experimental studies created by the Joanna Briggs Institute.

Strategy of data synthesis: Selection of Articles - The flowchart (PRISMA) was used in order to be able to record the results obtained from each phase for recording and reporting the results of the systematic review. The selection was carried out in two phases: First phase:
- Primary search: The number of articles that were obtained were classified according to the database of their origin, which were obtained according to the proposed search strategy. Titles and Abstract: The abstract of each article was reviewed and those that did not meet the inclusion criteria established in the PICOS strategy were excluded.
Elimination of duplicates: Duplicate articles whose titles are repeated were eliminated, but using the best quality databases as the

first option.
- Filtering by inclusion and exclusion criteria: Finally, the complete articles were observed in detail, where they will be selected, only the final articles that meet the inclusion criteria in detail, and those that do not meet these criteria, were considered excluded. of the study.
The research group was trained and calibrated in the use of the tools to be able to assess the risk of bias with different articles from those selected for the research. The tool that was used for the evaluation of the methodological quality of each in vitro study, used was the checklist for experimental studies created by the Joanna Briggs Institute (JBI).
- An evaluation of the heterogeneity of the results obtained from the selected articles was carried out in order to determine if they were comparable between them, verifying the possibility if a meta-analysis could be carried out.
Second phase:
In order for the articles to be included in the review, the evaluation of each one of them was carried out in greater depth.
It will have to be compared through the inclusion criteria, in the same way, both the researcher and the advisor, to carry out the reviews that will be included correctly, within the group of selected articles.

Subgroup analysis: Determine in the selected articles, how was the complete removal of caries (time) and presence of bacterial colonies (SEM), microhardness of the residual dentin when applying a chemical removing agent or rotary system.

Sensitivity analysis: None.

Language restriction: Only in vitro studies published in english, spanish and portuguese will be considered for inclusion.

Country(ies) involved: Perú.

Keywords: caries; chemomechanical agent; chemomechanical caries removal; permanent teeth; rotary system; conventional rotary system.

Dissemination plans: Once the systematic review is finished, it will be published in a dental journal

Contributions of each author:
Author 1 - Josselyn Quiroz - Author 1 drafted the manuscript.
Email: 100005375@cientifica.edu.pe
Author 2 - Sabina Mungi - Author 2 provided designing the review and interpretation data.
Email: smungic@cientifica.edu.pe