INPLASY

Effect of Low-Speed Electric Handpiece Rotational Speed on Diamond Rotary Instrument Cutting Efficiency on Zirconia Specimens with Different Grit Sizes

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Saini, R.

Corresponding author:
Ravinder Saini

dr_ravi_saini@yahoo.com

Author Affiliation:
King Khalid University.

ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 May 2024 and was last updated on 24 May 2024.

INTRODUCTION

Review question / Objective To assess the impact of low-speed electric handpiece rotational speed on the cutting effectiveness of diamond rotary instruments with various grit sizes when used on zirconia specimens.

Rationale To determine whether the rotation velocity of low-speed electric handpieces limits the cutting effectiveness of different-sized diamond rotary instruments on zirconia specimens, to establish the best rotation speed of a low-speed electric handpiece with different grit diamond rotary burs for zirconia specimens to achieve the highest cutting efficiency.

Condition being studied Grit Sizes , Rotational Speed, Cutting Effiiciency of Burs.

METHODS

Search strategy PubMed, Scopus, Web of Science, and Cochrane Library Database.

Participant or population The studies to be included should be centered on diamond rotary instruments used on zirconia specimens. Both in vitro studies with zirconia samples and clinical studies in patients where zirconia restorations were adjusted or shaped have been conducted.

Intervention The intervention of concern is the application of slow-speed electric handpieces at different rotational speeds.

Comparator Studies that focus on comparing the impact of different rotational speeds of low-speed electric handpieces.

Study designs to be included We took intoaccount both descriptive (case control andcohort) and interventional (trials) basedresearch that was written in English for thisreview.

Eligibility criteria All articles were peer-reviewed and published in English within the last 15 years to guarantee that the findings were relevant and contemporary.

Information sources PubMed, Scopus, Web of Science, and Cochrane Library Database.

Main outcome(s) Relationship between Rotational Speed and Cutting Efficiency.

Additional outcome(s) Optimal Rotational Speed for Maximum Cutting Efficiency.

Data management Data was processed in Microsoft Excel (Excel 365; Microsoft Corp., Redmond, WA, USA). For export and data manipulation, Google Sheets (Alphabet Inc., Mountain View, CA, USA) were also used. This is an online spreadsheet program included as part of the free, web-based Google Docs Editors suite offered by Google.

Quality assessment / Risk of bias analysis Two researchers independently assessed the risk of bias of the included articles using —JBI critical appraisal tools. The potential risk of bias was categorized as low if a study provided detailed information pertaining to 70% or more of the applicable parameters . Moderate risk was considered if a study provided information corresponding to less than 70% to 50% of the applicable parameters, whereas if a study showed missing information regarding more than 50% of the applicable parameters, the study was categorized as exhibiting a high risk of bias.

Strategy of data synthesis This was done in two stages, with the first stage consisting of a title and abstract screening of all studies against the inclusion criteria, and the second stage being a full text assessment of papers that were deemed potentially relevant based on the initial screening.

Subgroup analysis The data was compiled from a variety of articles:
• Author(s), year of publication, country, study design.
• Total number of patients/datasets.
• Training/validation datasets
• Test datasets
• Aim of the study.

Sensitivity analysis NA.

Language restriction Articles only in English were Selected.

Country(ies) involved India.

Keywords electric handpieces, diamond rotary instrument, cutting efficiency, zirconia, grit size.

Dissemination plans All the data and the article will be share after the publication.

Contributions of each author
Author 1 - RAVINDER SAINI - Drafting of manuscript, Data Analysis, Selection Criteria, Risk of Bias Editiing of Manuscript.
Email: rsaini@kku.edu.sa