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INPLASY

The Role of Platelet-Rich Plasma/Fibrin in Maxillary Sinus Floor Augmentation: A Systematic Review and Meta-Analysis

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Zhao, ZP[1]; Li, YJ[2]; Zhang, FY[3]; Lin, HY[4]; Gao, LX[5].

Corresponding author:
Zepeng Zhao

zepengzhao2001@outlook.com

Author Affiliation:
Hangzhou Medical College.

ADMINISTRATIVE INFORMATION

Support - Innovation and Entrepreneurship Training Program for College Students of Zhejiang Province（S202313023132）.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

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 December 2023 and was last updated on 24 December 2023.

INTRODUCTION

Review question / Objective The aim of this meta-analysis of randomized controlled trials is to evaluate the efficacy and safety of platelet-rich plasma/fibrin in maxillary sinus floor augmentation.

Condition being studied Maxillary sinus augmentation (also known as sinus floor elevation) procedures have become increasingly popular procedures before placement of dental implants in posterior maxillae that have suffered severe bone loss due to sinus pneumatization, alveolar bone atrophy, or trauma. Pneumatization of the maxillary sinus secondary to posterior maxillary tooth loss prevents implant placement in this region. Maxillary sinus elevation and augmentation provides predictable outcome of regenerating lost osseous structure in the posterior maxilla. This offers the patient many advantages for long-term success at implant sites. However, postoperative pain and swelling were obvious and the expected recovery is time-consuming.

METHODS

Participant or population Adult patients in need of maxillary sinus floor augmentation will be included.

Intervention Platelet-rich plasma/fibrin is the main intervention, which applied in the experimental operation.

Comparator Maxillary sinus elevation without platelet-rich plasma/fibrin.

Study designs to be included Randomized controlled trials (RCTs) will be included.

Eligibility criteria Inclusion criteria(1) Randomized controlled clinical trials evaluating histological or clinical outcomes, including parallel groups and

split-mouth designs;(2) Control: maxillary sinus elevation with bone graft only.Exclusion criteria(1) Patients with systemic contraindications, acute maxillary sinusitis or uncontrolled periodontal disease;(2) Results that are not profit-driven;(3) Retrospective, prospective cohort studies, case reports, conference minutes, and case series;(4) Repeated study.

Information sources We are searching randomized control trials in five electronic databases including PubMed, Web of Science, Scopus, Cochrane Library and MEDLINE. All the English publications until 1st October 2023 will be searched without any restriction of countries. Reference list of all selected articles will independently screened to identify additional studies left out in the initial search.

Main outcome(s) The increased vertical bone height of the alveolar bone after surgery.

Quality assessment / Risk of bias analysis Two reviewers will independently assess the quality of the selected studies according to the Cochrane Collaboration's tool for randomized controlled trials. Items will be evaluated in three categories: Low risk of bias, unclear bias and high risk of bias. The following characteristics will be evaluated: Random sequence generation (selection Bias); Allocation concealment (selection bias); Blinding of participants and personnel (performance bias); Incomplete outcome data (attrition bias); Selective reporting (reporting bias). Other biases results from these questions will be graphed and assessed using Review Manager 5.3.

Strategy of data synthesis All statistical tests will be performed using RevMan software version 5.3 (AYA). The significance of any variations in the estimates of the treatment effects from the different trials will be assessed by means of Cochrane's test for heterogeneity, and heterogeneity will be considered significant if P value <0.1. Heterogeneity between the studies will be assessed using the I^2 statistic (I^2-statistic), which describes the variation percentage due to heterogeneity rather than chance. I^2 over 50% will be considered as moderate to high heterogeneity.
Meta-analysis will undertake where studies of similar comparisons reported the same outcome measures. Risk differences (RD) for the implant failure and complications events will be calculated and compared between the two studied interventions. CIs will be set at 95% (95% CI).
Weighted means across the studies will be calculated using a fixed-effects model. Where statistically significant (P <0.1) heterogeneity will be detected, a random-effects model will be used to assess the significance of treatment effects.

Subgroup analysis We will consider subgroups such as clinic type, age group and location (rural/urban).

Sensitivity analysis The steps of single-factor sensitivity analysis include: determining the analysis index, selecting the uncertainty factors to be analyzed, analyzing the fluctuation degree of each uncertain factor and its possible change to the analysis index, and determining the sensitivity factor. After analyzing the index and selecting the uncertain factors, it is necessary to calculate the sensitivity coefficient. The correct sequence of steps is to determine the analysis index, select the uncertain factors that need to be analyzed, analyze the fluctuation degree of each uncertainty factor and the change that it may bring to the analysis index, determine the sensitive factors, and choose the scheme.

Country(ies) involved China.

Keywords Platelet-Rich Plasma/Fibrin; Maxillary Sinus Floor Augmentation; Dental; Implant; Meta-Analysis.

Contributions of each author

Author 1 - Zepeng Zhao.
Email: zepengzhao2001@outlook.com
Author 2 - Yijin Li.
Email: 3177818794@qq.com
Author 3 - Fengyuan Zhang.
Email: zhangfengyuan816@126.com
Author 4 - Haiyan Lin.
Email: linhaiyan@eetop.com
Author 5 - Lixia Gao.
Email: gaolixia124@126.com