INPLASY PROTOCOL

To cite: Hao et al. Efficacy of applying vitamin E-diffused highly cross-linked polyethylene cups in total hip replacement: A meta-analysis. Inplasy protocol 202190042. doi: 10.37766/inplasy2021.9.0042

Received: 14 September 2021

Published: 14 September 2021

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Support: **None.**

Review Stage at time of this submission: **The review has not yet started.**

Conflicts of interest:
None declared.

Efficacy of applying vitamin E-diffused highly cross-linked polyethylene cups in total hip replacement: A meta-analysis

Hao, DS[1]; Wang, JJ[2].

Review question / Objective: **To demonstrate the efficacy of vitamin E-diffused highly cross-linked polyethylene cups via a comprehensive meta-analysis of randomized controlled trials.**
Condition being studied: **Hip arthritis, hip fracture, hip deformity.**
Eligibility criteria: **(1) participants: individuals who suffered from hip diseases; (2) intervention: THR; groups in which vitamin E-diffused polyethylene cups were applied were set as experimental groups, and those in which polyethylene cups without vitaminE diffusion were applied were deemed controls; (3) outcomes: parameters that evaluated prosthesis wear and penetration, as well as patient-reported outcome measures (PROMs); (4) type of study: RCT; and (5) language of article: English.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 September 2021 and was last updated on 14 September 2021 (registration number INPLASY202190042).

INTRODUCTION

Review question / Objective: **To demonstrate the efficacy of vitamin E-diffused highly cross-linked polyethylene cups via a comprehensive meta-analysis of randomized controlled trials.**

Condition being studied: **Hip arthritis, hip fracture, hip deformity.**

METHODS

Participant or population: **Individuals who suffered from hip diseases.**

Intervention: Total hip replacement using vitamin E-diffused highly cross-linked polyethylene cups or not.

Comparator: Parameters that evaluated prosthesis wear and penetration, as well as patient-reported outcome measures.

Study designs to be included: Randomized controlled trials.

Eligibility criteria: (1) participants: individuals who suffered from hip diseases; (2) intervention: THR; groups in which vitamin E-diffused polyethylene cups were applied were set as experimental groups, and those in which polyethylene cups without vitaminE diffusion were applied were deemed controls; (3) outcomes: parameters that evaluated prosthesis wear and penetration, as well as patient-reported outcome measures (PROMs); (4) type of study: RCT; and (5) language of article: English.

Information sources: PubMed, EMBASE, the Web of Science, and the Cochrane Central Register of Controlled Trials.

Main outcome(s): Femoral head penetration, steady-state wear, cup migration, Harris hip score (HHS), University of California Los Angeles (UCLA) activity score, and visual analogue scale-pain (VAS-p) score at different follow-up time points.

Quality assessment / Risk of bias analysis: The methodological quality of the included randomized controlled trials was assessed using the Cochrane risk of bias tool.

Strategy of data synthesis: Software RevMan 5.3 was used to conduct this meta-analysis. Using a fixed-effects model, the mean difference (MD) and 95% confidence interval(95%CI) were computed for the continuous variates. Results with $P<0.05$ were considered statistically significant. The chi-square($\chi 2$) and I2 tests were performed and forest plots were created to present heterogeneity among studies, which was deemed to exist if p50%.

Subgroup analysis: None (no need).

Sensitivity analysis: None (no need).

Country(ies) involved: China.

Keywords: vitamin E; highly cross-linked polyethylene; total hip replacement; meta-analysis; randomized controlled trials.

Contributions of each author:
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