International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

Effectiveness and safety of aspirin versus other anticoagulants for VTE after total hip and knee arthroplasty: a pooled analysis

INPLASY2025100043
doi: 10.37766/inplasy2025.10.0043
Received: 13 October 2025
Published: 13 October 2025

Shen, NN; Qian, H; Ma, JH; Li, W; Fu, YP.

Corresponding author:
Nan-Nan Shen

shennannan_123@163.com

Author Affiliation:
Affiliated hospital of Shaoxing University.

ADMINISTRATIVE INFORMATION

Support - None.

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

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025100043

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 8 October 2025 and was last updated on 8 October 2025.

INTRODUCTION

Review question / Objective Venous thromboembolism (VTE) is a potentially fatal complication in patients undergoing total hip arthroplasty (THA) and total knee arthroplasty (TKA). Multiple anticoagulants are routinely used to prevent VTE after THA and TKA. However, it remains unclear which anticoagulant is the optimal in real-world clinical practice.

Rationale This study aimed to assess effectiveness and safety of aspirin and other anticoagulants for VTE prophylaxis following THA and TKA.

Condition being studied Given the available scarce and conflicting evidence, this study aims to compare the real-world effectiveness and safety of different anticoagulants on reducing VTE prevention in patients undergoing THA or TKA. This study will provide new real-world evidence for thromboembolic strategies for VTE prophylaxis following THA or TKA.

METHODS

Search strategy #1: “hip arthroplasty”[MeSH Terms] OR “knee arthroplasty”[Title/Abstract] OR “total knee arthroplasty” [Title/Abstract] OR “ total hip arthroplasty ”[Title/Abstract] OR “TKA”[Title/Abstract] OR “THA”[Title/Abstract]
#2 : “dabigatran”[MeSH Terms] OR “dabigatran” [Title/Abstract] OR “rivaroxaban”[MeSH Terms] OR “rivaroxaban”[Title/Abstract] OR “apixaban” [MeSH Terms] OR “apixaban”[Title/Abstract] OR “Eliquis” [Title/Abstract] OR “edoxaban”[MeSH Terms] OR “edoxaban”[Title/Abstract] OR “Savaysa” [Title/Abstract]) OR “betrixaban”[MeSH Terms] OR “betrixaban”[Title/Abstract] OR “Bevyxxa” [Title/Abstract]) OR “Non-vitamin K antagonist oral anticoagulants”[Title/Abstract] OR “NOACs” [Title/Abstract]) OR “direct oral anticoagulants”[Title/Abstract]) OR “DOACs”[Title/Abstract]) OR “novel oral anticoagulants”[Title/Abstract]) OR “new oral anticoagulants”[Title/Abstract]) OR “warfarin”[Title/Abstract]) OR “antiplatelet drug”[Title/Abstract].

Participant or population The inclusion criteria were as follows: (1) The real-world data include case-control, observational, prospective or retrospective study design; (2) Studies that include patients receiving antithrombotic therapy after total hip arthroplasty (THA) or total knee arthroplasty (TKA); (3) Antithrombotic agents includes aspirin, factor Xa-inhibitors, low-molecular-weight heparin (LMWH), direct oral anticoagulants (DOACs), or warfarin, etc.; (4) Studies investigating VTE, major bleeding, or thromboembolic events after THA or TKA. VTE was defined as deep vein thrombosis (DVT) or pulmonary embolism (PE) detected through clinical or symptomatic means. Major bleeding was defined as intracranial hemorrhage, gastrointestinal bleed, or any bleeding requiring a return to theater.
Exclusion criteria: (1) Incomplete outcome data; (2) Studies evaluating bleeding or thromboembolic events without anticoagulant or antiplatelet therapy; (3) review articles, conference abstract, case report, editorials,study protocol,etc..

Intervention The exposure group is constituted by consecutive patients on aspirin therapy for VTE after total hip and knee arthroplasty.

Comparator The exposure group is constituted by consecutive patients on other anticoagulants therapy for VTE after total hip and knee arthroplasty.

Study designs to be included Studies with the following conditions will be included: the retrospective or prospective studies that reported effectiveness and safety of aspirin versus other anticoagulants for VTE after total hip and knee arthroplasty.

Eligibility criteria The inclusion criteria were as follows: (1) The real-world data include case-control, observational, prospective or retrospective study design; (2) Studies that include patients receiving antithrombotic therapy after total hip arthroplasty (THA) or total knee arthroplasty (TKA); (3) Antithrombotic agents includes aspirin, factor Xa-inhibitors, low-molecular-weight heparin (LMWH), direct oral anticoagulants (DOACs), or warfarin, etc.; (4) Studies investigating VTE, major bleeding, or thromboembolic events after THA or TKA. VTE was defined as deep vein thrombosis (DVT) or pulmonary embolism (PE) detected through clinical or symptomatic means. Major bleeding was defined as intracranial hemorrhage, gastrointestinal bleed, or any bleeding requiring a return to theater.
Exclusion criteria: (1) Incomplete outcome data; (2) Studies evaluating bleeding or thromboembolic events without anticoagulant or antiplatelet therapy; (3) review articles, conference abstract, case report, editorials,study protocol,etc..

Information sources Several electronic databases, including PubMed, Embase, and the Cochrane Library were systematically searched.

Main outcome(s) The incidence rate of bleeding and thromboembolic events in patients with aspirin versus other anticoagulants for VTE undergoing THA/TKA.

Additional outcome(s) None.

Data management The extracted data mainly included title, first author's name, publication year, region or country, patients characteristics, sample size, study design, type of antithrombotic agents, primary outcome (VTE, DVT, or PE) , secondary outcome (major bleeding, or other complications) , etc..

Quality assessment / Risk of bias analysis All data extraction was performed independently by two reviewers and compared at the end to minimize selection bias. In case of disagreements, a third reviewer reviewed the database and resolved any contradiction through consensus. Two investigators independently appraised the risk bias of each included study using the modified version of Newcastle-Ottawa Scale (NOS), which comprises the following domains: representativeness of sample population, sample size, participation rate, outcome assessment, and analytical methods to control for bias26. an overall score can range from 0 to 9, and cumulative score > 7 was considered an high quality, while a score < 4 indicated low quality.

Strategy of data synthesis The efficacy and safety were presented as pooled rate with corresponding 95% confidence interval (CI) using a random-effects model. Heterogeneity among studies was analyzed using I2 test, $I2 > 50\%$ indicated significant heterogeneity. Subgroup analyses were conducted based on classification of antithrombotic agents, study type, dose regimen, and different geographical regions (Asia, North America, and Europe) to investigate the source of heterogeneity.

Subgroup analysis Subgroup analyses were conducted based on classification of antithrombotic agents, study type, dose regimen, and different geographical regions (Asia, North America, and Europe) to investigate the source of heterogeneity.

Sensitivity analysis Sensitivity analysis was analyzed through one by one excluding the included studies to determine the stability of results.

Language restriction With language restriction of English.

Country(ies) involved China.

Other relevant information None.

Keywords Aspirin, Anticoagulants, THA, TKA, VTE.

Contributions of each author

Author 1 - Nan-Nan Shen - Nan-Nan Shen drafted the manuscript.
Email: shennannan_123@163.com
Author 2 - Hua Qian - Hua Qian designed the study.
Email: 1044160582@qq.com
Author 3 - Jun-Hong Ma - Jun-Hong Ma performed the search strategy.
Email: majunhong1975@163.com
Author 4 - Wei Li - Wei Li proofed the final revisions.
Email: liweihljzyy2015@126.com
Author 5 - Yong-Ping Fu - Yong-Ping Fu proofed the final revisions.
Email: 3807944@qq.com