Equivalence of DOACs and LMWH for Thromboprophylaxis After Hip Fracture Surgery: Systematic Review and Meta-Analysis

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Introduction

Operated patients with hip fractures (HF) have an increased risk of venous thromboembolism (VTE). The aim of this study was to systematically review the literature comparing the effectiveness of direct oral anticoagulants (DOACs) and low molecular weight heparin (LMWH) for thromboprophylaxis in surgically treated HF patients.

Method

We searched PubMed, the Cochrane Library, Web of Science, and Embase. The primary outcome was the incidence of VTE (symptomatic and asymptomatic combined). Secondary outcomes were asymptomatic VTE; symptomatic VTE; symptomatic deep venous thrombosis (DVT); symptomatic pulmonary embolism (PE); major, clinically relevant non-major (CRNM), and minor bleeding. Meta-analysis was performed to compare the odds of VTE and secondary outcomes between DOACs and LMWH.

Results

The search resulted in 738 titles. Five studies, of which 2 RCTs, matched inclusion criteria. In total, 4,748 hip fracture patients were analyzed (DOACs: 2,276 patients, LMWH: 2,472 patients). The pooled odds ratio for the risk of VTE for DOAC use was 0.52 (95% confidence interval 0.25 – 1.11, p=0.09) compared to LMWH. No statistically significant differences between DOAC and LMWH were found for asymptomatic VTE, symptomatic DVT, PE, major or CRNM bleeding, and minor bleeding.

Conclusion

Meta-analysis of the literature suggests that DOACs are associated with equivalent effectiveness and safety compared to LMWH in surgically treated hip fracture patients. A trend towards superior effectiveness is reported, indicating the need for larger prospective, ideally randomized, studies comparing DOACs and LMWH in this high risk population.

Figure 1. Odds of Venous Thromboembolism for Direct Oral Anticoagulants (DOAC) versus Low Molecular Weight Heparin (LMWH)

Figure 2. Odds of Major and Clinically Relevant Non-Major Bleeding for Direct Oral Anticoagulants (DOAC) versus Low Molecular Weight Heparin (LMWH)