

Rivaroxaban for Prevention of Venous Thromboembolism after Total Knee Replacement: Impact on Healthcare Costs Based on the RECORD4 Study

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Introduction

- ◆ Rivaroxaban is an oral, direct Factor Xa inhibitor that has recently been approved in the European Union and Canada for the prevention of venous thromboembolism (VTE) after elective total hip or knee replacement (THR or TKR) surgery. It has been submitted for Food and Drug Administration approval for prophylaxis of deep vein thrombosis (DVT) and pulmonary embolism (PE) in patients undergoing THR or TKR
- ◆ Two large, phase III, randomized controlled trials (RECORD3 and 4) compared oral rivaroxaban with subcutaneous (s.c.) enoxaparin (both administered for 12±2 days) after TKR
- ◆ In the RECORD3 trial,¹ rivaroxaban 10 mg once daily (od) showed statistically significant relative risk reduction (RRR) in the primary outcome compared with an enoxaparin regimen of 40 mg od
 - Enoxaparin 30 mg twice daily (bid) is the more widely used regimen in North America for VTE prophylaxis after TKR
- ◆ The RECORD4 trial² compared rivaroxaban 10 mg od with enoxaparin 30 mg bid
 - The primary efficacy endpoint (the composite of DVT, PE, and all-cause mortality) was analyzed in the modified intention-to-treat population, and occurred in 6.9% of rivaroxaban patients and 10.1% of enoxaparin patients (RRR 32%; $p < 0.012$)
 - Symptomatic VTE was observed in 0.7% of rivaroxaban patients and 1.2% of enoxaparin patients, although this difference was not statistically significant
 - The rates of major bleeding were similar between the rivaroxaban and enoxaparin groups

Objective

- ◆ To estimate the impact of the reductions in VTE associated with rivaroxaban use and oral versus s.c. administration on US healthcare costs from a US payer's perspective

Methods

- ◆ The potential economic impact of rivaroxaban was assessed using the efficacy data (the composite of DVT, PE, and all-cause mortality) from RECORD4, and by considering cost reductions associated with an oral route of administration
- ◆ The treatment costs for symptomatic VTE and major bleeding were taken from published data on managed care in the US,³ with all costs being inflated to 2007 US\$
- ◆ For costing purposes, the duration of hospitalization for TKR (4 days) was obtained from a published US orthopaedic registry⁴
- ◆ A sensitivity analysis included incremental costs associated with home healthcare nurse visits to administer s.c. injections based on other studies and clinical experience of VTE in the US⁵
- ◆ The duration of prophylaxis was assumed to be 14 days. The analysis assumed similar daily drug acquisition costs to enoxaparin 40 mg od, which is less expensive than enoxaparin 30 mg bid⁶

Results

- ◆ The total cost associated with healthcare resource use in the US for the duration of treatment was US\$469 per patient with enoxaparin 30 mg bid injections and US\$307 with oral rivaroxaban 10 mg od, which implies a saving of US\$162 per patient. In the preliminary economic analysis, this improvement was driven primarily by the reduced drug acquisition relative to enoxaparin 30 mg bid, and monitoring costs (Figure 1)

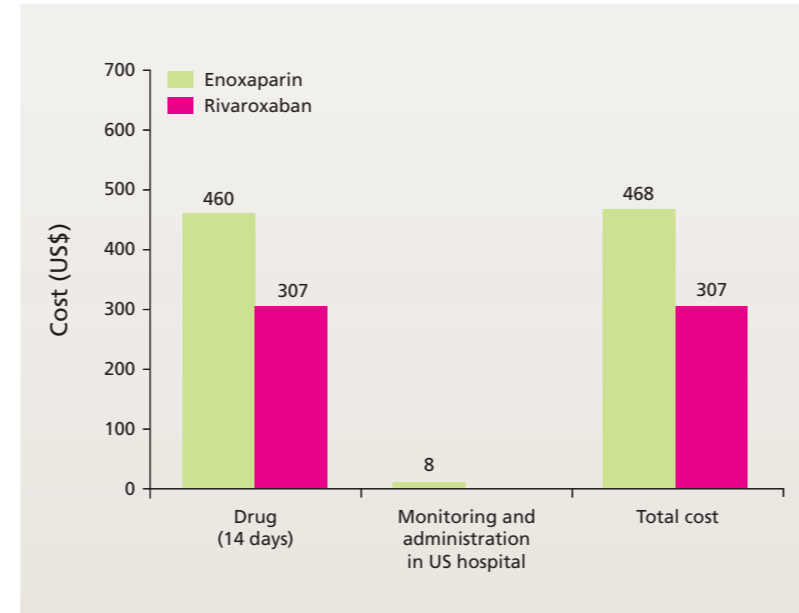


Figure 1. Estimated cost – if there is no difference in symptomatic events.

- ◆ There may be an additional benefit if significant RRRs in symptomatic events occur in clinical practice
- ◆ In addition, published data⁵ indicate that home healthcare nurse visits during the post-hospital prophylaxis period cost an average of US\$100 for enoxaparin, suggesting that potential savings with rivaroxaban could be US\$261 per patient (Figure 2)
- ◆ Estimated US costs for the in-hospital treatment for symptomatic VTE range from US\$9,805 to US\$14,146 per event³ and, if adjusted for 2007 US medical care cost inflation, might range from US\$10,000 to US\$16,000. Given the reduced incidence of symptomatic events with rivaroxaban, there may be even further savings in healthcare costs (Figure 3)

Other Variables Likely to Affect Costs not Covered in the Analysis

- ◆ Costs associated with long-term complications (e.g. post-thrombotic syndrome) were excluded from this analysis

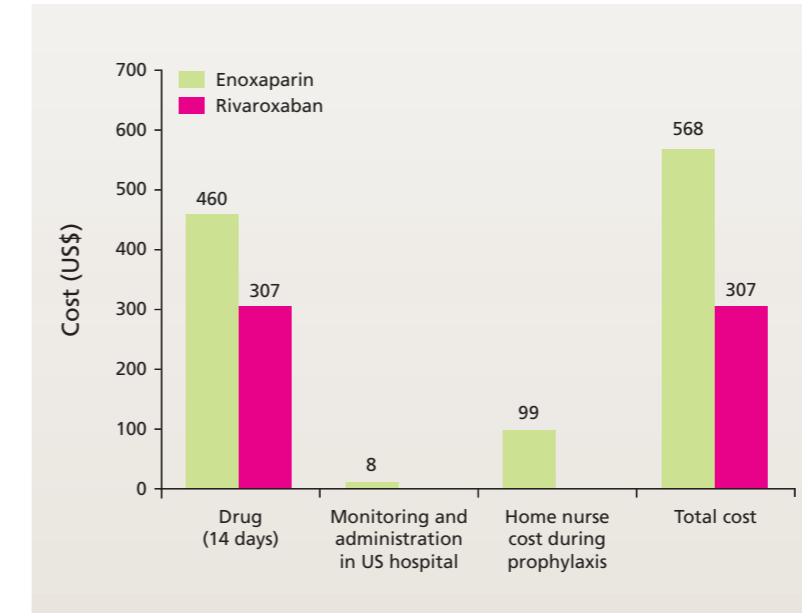


Figure 2. Additional cost associated with home healthcare nurse visits – if there is no difference in symptomatic events.

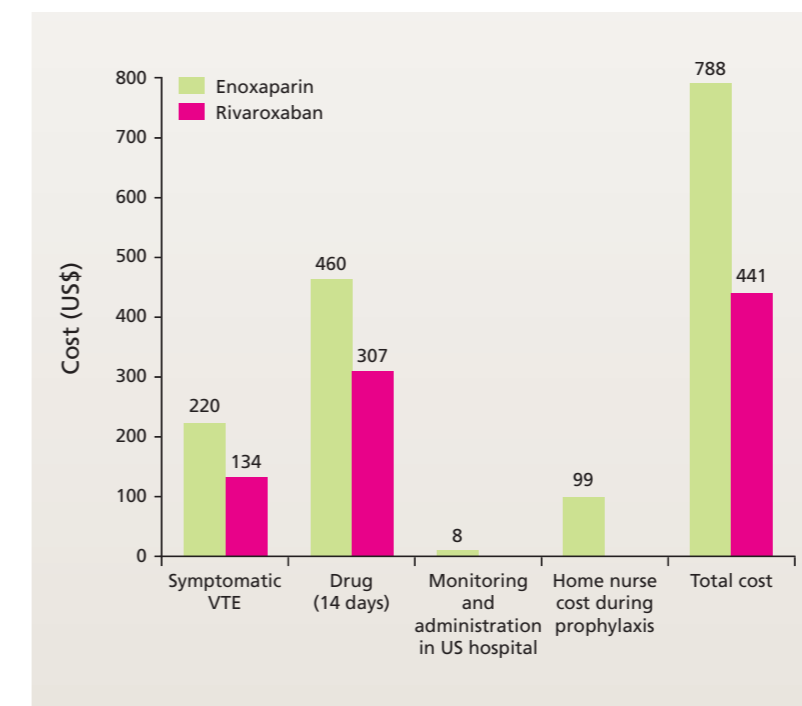


Figure 3. Estimated cost – if there is a difference in symptomatic events. VTE, venous thromboembolism.

- ◆ Any benefits such as reduced hospital readmission, or reduced costs due to a reduction in recurrent symptomatic VTE during the post-prophylaxis period
- ◆ Asymptomatic events, which may result in a symptomatic VTE within 1 to 3 months, are likely to have an impact on healthcare costs within 1 year of TKR surgery
- ◆ Patients' treatment satisfaction and adherence to oral medication; these are important after hospital discharge and can influence the effectiveness of VTE prophylaxis

Conclusion

- ◆ The improved efficacy of rivaroxaban over enoxaparin 30 mg bid for prevention of VTE after TKR and the predicted reduction in administration and acquisition costs are expected to result in savings to healthcare resources. With more than 300,000 US patients having TKR annually, these potential cost savings are significant and may range from US\$46 to US\$104 million annually

References and Disclosures

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This study was supported by Bayer HealthCare AG and Johnson & Johnson Pharmaceutical Research & Development, L.L.C. Louis Kwong receives research funding from Bayer HealthCare. Nishan Sengupta is employed by Johnson & Johnson. Michael Lees is employed by Bayer HealthCare. The data contained within this poster do not support or recommend the use of rivaroxaban in any countries in which it is not approved.

Abstract 1289 presented at the American Society of Hematology (ASH) 50th Annual Meeting and Exposition, San Francisco, CA, USA; December 6–9, 2008