

Prophylaxis with rivaroxaban against venous thromboembolism (VTE): a cost-consequence analysis from the Italian Healthcare Service perspective

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Introduction

- ◆ Thromboprophylactic regimens based on rivaroxaban – a novel, oral, once-daily, direct Factor Xa inhibitor approved in the EU and Canada for the prevention of venous thromboembolism (VTE) in adult patients undergoing elective total hip and total knee replacement (THR/TKR) surgery – were compared with subcutaneous enoxaparin (40 mg once daily) regimens in phase III randomized clinical trials in patients undergoing THR (RECORD1 and RECORD2)^{1,2} or TKR (RECORD3)³
- ◆ In addition to the clinical benefits associated with reducing symptomatic VTE, significant economic benefits may be achievable because fewer healthcare resources may be required with rivaroxaban

Objective

- ◆ To assess the impact on non-drug healthcare costs in Italy associated with rivaroxaban regimens, compared with enoxaparin regimens, after THR/TKR. This analysis incorporated the impact of differences in symptomatic VTE and related complications

Methods

- ◆ An economic model was developed to assess the clinical and economic consequences of rivaroxaban versus enoxaparin from the Italian Healthcare Service perspective. The model is divided into three modules: prophylaxis, post-prophylaxis and long-term complications (Figure 1). The first two modules constitute the acute phase and are represented with a decision tree, whereas the third module is developed as a Markov process

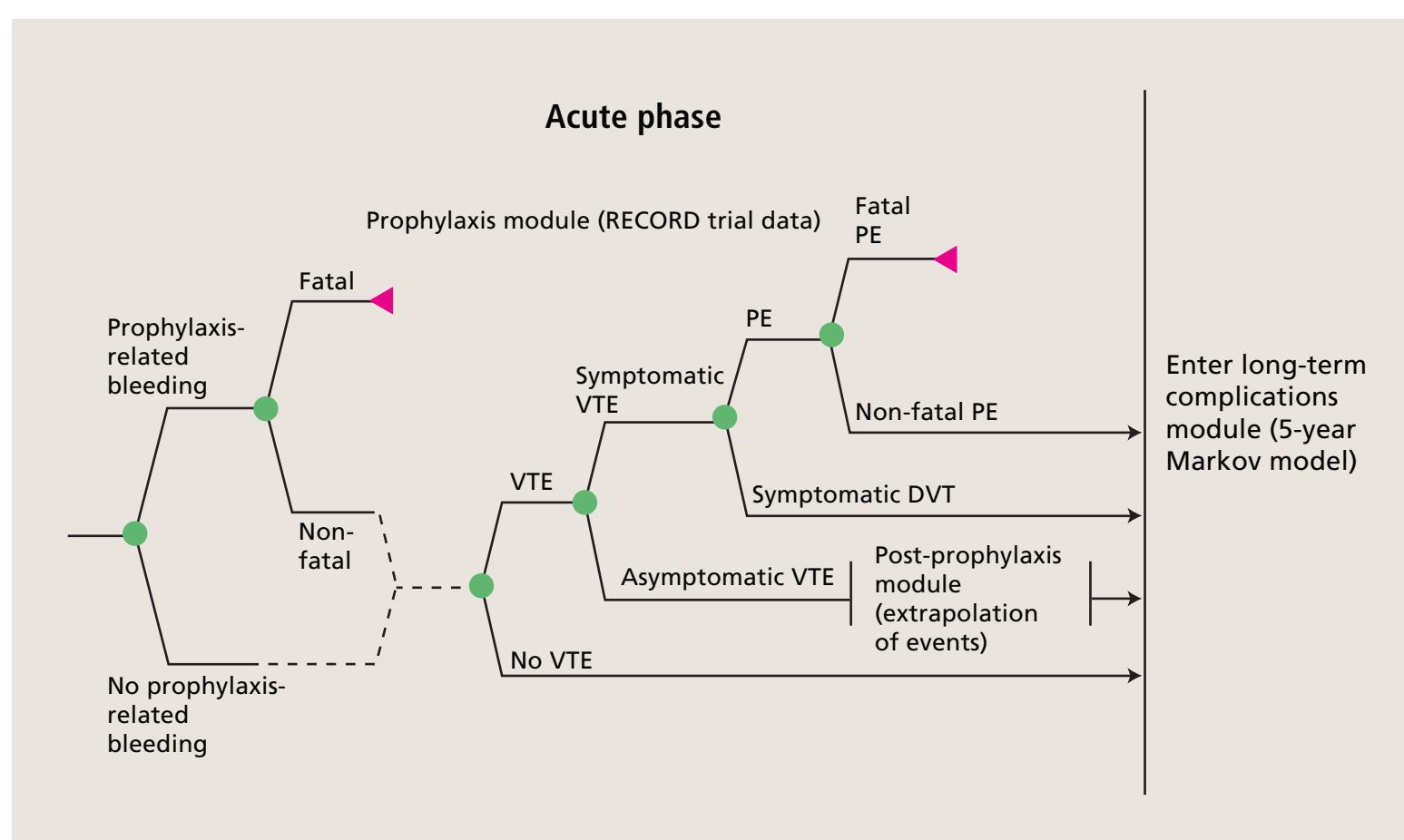


Figure 1. Economic model. DVT, deep vein thrombosis; PE, pulmonary embolism; VTE, venous thromboembolism.

- ◆ The base-case analysis examines both events occurring during the acute phase and long-term complications arising as a result of VTE events and estimates costs and outcomes over a 5-year time period
- ◆ The model was populated using RECORD1–3 data. Risks of VTE, post-thrombotic syndrome and chronic thromboembolic pulmonary hypertension beyond the trial were estimated from published data.^{4–7} Resource consumption related to events is based on clinical guidelines, product labels, published data and expert opinion. Unit costs were derived from published Italian sources and expressed in 2008 euros (€).^{8–10} Costs were discounted at 3%
- ◆ The following costs were not considered in the analysis
 - Asymptomatic events costs were excluded from the analysis due to lack of evidence of their impact on healthcare resources use
 - Administration costs have not been included for any drug
 - Acquisition costs for rivaroxaban and enoxaparin were excluded because the reimbursed price of rivaroxaban has not yet been established
- ◆ A one-way sensitivity analysis was conducted on the following parameters: separate results for THR/TKR, symptomatic VTE event costs, long-term complication costs and discount rate

Results

- ◆ Rivaroxaban reduced total VTE after THR by 70% versus 35 days' enoxaparin (RECORD1) and 79% versus 12±2 days' enoxaparin followed by placebo (RECORD2)

- ◆ After TKR, rivaroxaban reduced total VTE by 49% versus enoxaparin (RECORD3)
- ◆ Per patient, the combined improvement in health outcomes with rivaroxaban after THR/TKR was 0.021 symptomatic VTE events
- ◆ Rates of major bleeding were similar in both treatment groups
- ◆ Estimated costs per patient due to VTE events and complications in the 5 years after THR/TKR were €142.30 for enoxaparin and €60.98 for rivaroxaban
- ◆ Cost savings for rivaroxaban became evident after the first year of the projection (Figure 2)

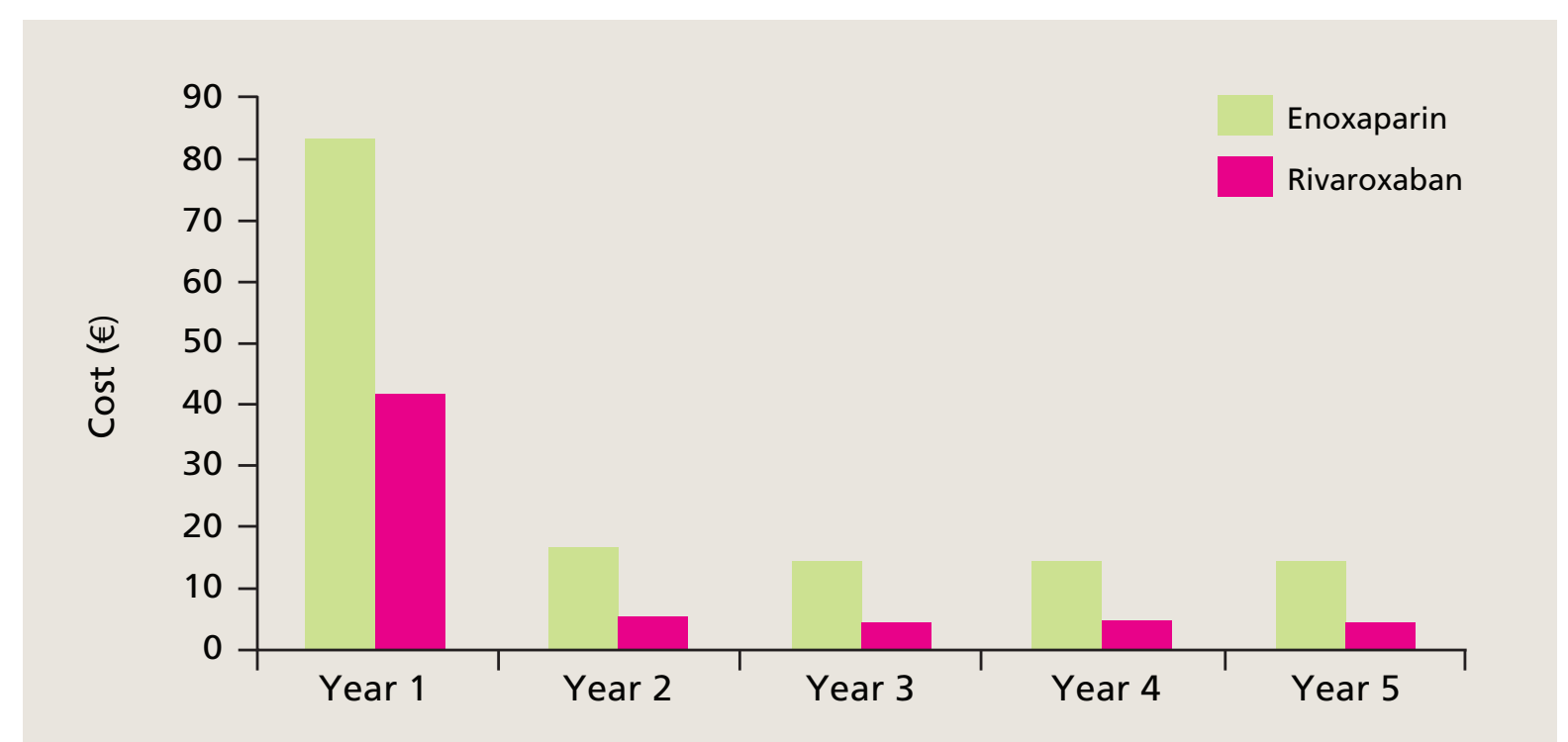


Figure 2. Annual cost per patient after total hip replacement/total knee replacement.

- ◆ The one-way sensitivity analysis conducted on the main model inputs showed that results were robust against the different hypotheses tested (Table 1)

Table 1. One-way sensitivity analysis

| Sensitivity analysis | Savings with rivaroxaban | Symptomatic events avoided with rivaroxaban |
|---|--------------------------|---|
| Base case | 81.32 | 0.021 |
| Total hip replacement (RECORD1 and 2) | 68.16 | 0.017 |
| Total knee replacement (RECORD3) | 101.66 | 0.030 |
| 10% decrease in deep vein thrombosis and pulmonary embolism costs and 20% decrease in long-term complications costs | 71.38 | 0.021 |
| Costs and events undiscounted | 85.67 | 0.021 |
| Costs and events discounted at 5% | 78.74 | 0.021 |

- ◆ During 2004, there were 96,000 THR/TKR surgeries performed in Italy. Rivaroxaban might reduce VTE substantially and could potentially generate total non-drug cost savings of approximately €7.6 million in this population

Conclusions

- ◆ The improved efficacy of rivaroxaban is likely to result in reduced non-drug healthcare costs in Italy
- ◆ Reduced costs associated with oral administration were not included in this analysis, but are expected to provide additional cost offsets

References

1. Eriksson BI et al. *N Engl J Med* 2008;358:2765–2775.
2. Kakkar AK et al. *Lancet* 2008;372:31–39.
3. Lassen MR et al. *N Engl J Med* 2008;358:2776–2786.
4. Quinlan DJ et al. *J Thromb Haemost* 2007;5:1438–1443.
5. White RH et al. *Arch Intern Med* 1998;158:1525–1531.
6. Prandoni P et al. *Haematologica* 1997;82:423–438.
7. Pengo V et al. *N Engl J Med* 2004;350:2257–2264.
8. National DRG tariff (Ministry of Health Decree 13-12-2006).
9. Outpatient National Tariff List December 2006 (Tempi Medi di Attività, Modalità di Esecuzione. Nomenclatore delle Prestazioni Specialistiche Ambulatoriali Territoriali). Available at: http://www.sumaiweb.it/fullfile_593.
10. CFT 2000 – Compendio Farmaceutico Telematico Farmadati Italia.

Disclosures

This study was supported by Bayer HealthCare AG and J&JPRD. Xarelto® (rivaroxaban) is licensed in the EU and Canada for the prevention of venous thromboembolism in adult patients undergoing elective total hip and knee replacement surgery. The data contained within this poster do not support or recommend the use of Xarelto in any other indication or countries in which it is not licensed.

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