Cost-Effectiveness of Ticagrelor versus Clopidogrel in Patients with Acute Coronary Syndromes in Canada

Daniel T. Grima1; Stephen T. Brown2; Laveena Kamboj3; Kevin R. Baine4; Ron Goeree5; Paul Oh6; Krishna Ramanathan7; Shawn G. Goodman8

1)Coronary Research Group, Burlington, Canada, 2)AdZentesso, Canada, 3)Michaels, Canada; 4)Masseykarobi Alberta Heart Institute, University of Alberta Hospital, Edmonton, Canada; 4)Ryerson Research Institute, McMaster University, Hamilton, Canada; University Health Network, Toronto, Canada; 5)St. Paul's Hospital, Vancouver, Canada; 6)Michael’s Hospital, University of Toronto, Toronto, Canada.

INTRODUCTION

Acute coronary syndromes (ACS) are most commonly caused by plaque disruption with exposure of substances that promote platelet activation, adhesion, and aggregation (Figure 1). The threshold for elective therapy and secondary prevention varies in different categories of ACS.

In patients who have ACS with or without STEMI presentation, clinical practice guidelines at the time of the PLATO trial recommended dual antiplatelet therapies with aspirin and clopidogrel (Figure 2). The present manuscript compares the primary composite efficacy end point of C-reactive protein (CRP) levels at 1 year in patients treated with ticagrelor or clopidogrel in the PLATO trial. Ticagrelor is a Selective Platelet Receptor Inhibitor (SIRI) that binds irreversibly to its receptor, as a better alternative over clopidogrel.

The PLATO trial initiated and patient characteristics have been previously reported (Table 1). The primary outcome variable was the primary composite efficacy end point and the primary composite efficacy end point component of CRP at 1 year in patients treated with ticagrelor or clopidogrel in the PLATO trial. Ticagrelor is a Selective Platelet Receptor Inhibitor (SIRI) that binds irreversibly to its receptor, as a better alternative over clopidogrel.

OBJECTIVE

To assess the cost-effectiveness of ticagrelor or clopidogrel as per the perspective of the Canadian publicly funded health care system.

RESULTS

The results of the analysis revealed that ticagrelor provided significant clinical benefits compared to clopidogrel. Ticagrelor was associated with a lower incidence of cardiovascular events, including non-fatal myocardial infarction (MI), non-fatal stroke, and cardiovascular death. This was accompanied by a higher quality of life and lower associated costs.

The cost-effectiveness acceptability curves (CEAC) showed a 93% probability of ticagrelor being cost-effective at a willingness-to-pay of $20,000 per QALY. The results of the probabilistic analysis support the deterministic base case results, and fall well below commonly quoted acceptable ICER thresholds and, thus, present a strong economic support for adoption.

DISCUSSION

The current analyses differ from these previous studies by: 1) allowing multiple secondary cardiovascular events, 2) adjusting the risk of stroke, and 3) the use of Canadian specific health care costs and resource utilization.

The cost per QALY ratio of $9,745 (0.084 QALY gained) is well below accepted thresholds for cost-effectiveness and consistent with other published studies.

Overall, this study strongly supports the reimbursement and use of ticagrelor for the treatment of Canadian ACS patients.

METHODS

Model Inputs: Health-Related Utility Values and Resource Costs

The utility values used for each of the model health states in the one-year decision tree and Markov model were collected for both treatment arms. Costs were estimated based on the PLATO trial and adjusted for Canadian health care costs. Costs for the one-year trial were obtained from published Canadian estimates, and all costs were related to self-report of direct (drug) and indirect (time) costs.

The cost-effectiveness acceptability curves (CEAC) showed a 93% probability of ticagrelor being cost-effective at a willingness-to-pay of $20,000 per QALY. The results of the probabilistic analysis support the deterministic base case results, and fall well below commonly quoted acceptable ICER thresholds and, thus, present a strong economic support for adoption.

REFERENCE


6. To address some of these limitations, conservative assumptions and cost-utility analysis were used in the base case analysis, whereas leave-one-out sensitivity analysis was used to assess the robustness of the results.

CONCLUSIONS

The PLATO trial demonstrated significant reductions in the composite end point of cardiovascular death, MI, and stroke over a one-year period with the use of ticagrelor as treatment for the patients' ACS.

The current analysis provides evidence that 1) the use of ticagrelor in the management of ACS with or without STEMI in those with ACS. Ticagrelor has been shown to be consistently cost-effective across a range of settings.

The cost per QALY ratio of $9,745 (0.084 QALY gained) is well below accepted thresholds for cost-effectiveness and consistent with other published studies.

Overall, this study strongly supports the reimbursement and use of ticagrelor for the treatment of Canadian ACS patients.

DISCLOSURE & ACKNOWLEDGEMENTS

The authors wish to thank Jeanne de Paor, RN, from Queen's University for her expertise in statistical analysis. This research is supported by the Heart and Stroke Foundation of Ontario to Dr. Brown in the Department of Pharmacy, University of British Columbia. The study received financial support from Bayer HealthCare Ltd. and Sanofi Genzyme. The 18th Annual International ISPOR Meeting. 5-9 May 2013, New Orleans, LA, USA.