

Executive Summary

Research Project: Cost-Utility Analysis of Bortezomib, Thalidomide and Lenalidomide for Relapsed/Refractory Multiple Myeloma Treatment

Background: Multiple myeloma (MM) is formed during the division of plasma cells in the bone marrow which were formerly B lymphocytes, and accounts for 10% of all types of hematological cancer. Previous research conducted in Asia, including Thailand, has shown that approximately 1 in 4 (25.7%) of MM patients do not respond well to treatments or relapse (relapsed/refractory MM, or RRMM). At present, the treatment of RRMM patients consists of chemotherapy using typical drugs such as melphalan together with prednisolone (MP) and high-dose dexamethasone, and novel agents such as bortezomib, thalidomide, and lenalidomide – which are not only more effective but can also be used together with typical drugs to increase treatment effectiveness even more. However, these novel agents have not yet been included in the National List of Essential Medicines (NLEM) and thus patients are unable to access them.

Objective: To assess the cost-effectiveness of treating RRMM patients with bortezomib-based regimens, thalidomide-based regimens, and lenalidomide-based regimens compared to the control treatment of high-dose dexamethasone via a cost-utility analysis and budget impact analysis.

Methods: This study uses a model-based economic evaluation by conducting a cost-utility analysis from a societal perspective as well as the budget impact from a budget holder perspective. A Markov model was used to simulate treatment using bortezomib-based regimens, thalidomide-based regimens, and lenalidomide-based regimens for RRMM patients or MM patients who were not receptive to typical drugs. The epidemiological data used in the simulation were retrieved from a systematic literature review that included data in the Thai context, and cost and utility data were obtained from information in Thailand. Future costs and outcomes will be discounted at 3% per annum, parameter uncertainty will be analyzed using one-way and probabilistic sensitivity analysis, and a threshold analysis will also be conducted.

Results: For predicting survival rates, it was found that using high-dose dexamethasone, thalidomide, bortezomib, and lenalidomide resulted in patient median survival being equivalent to 15, 15.5, 16, and 17 months, respectively. From a societal perspective, bortezomib was the most cost-effective drug as its incremental cost-effectiveness ratio (ICER) was 9,908,461 baht per additional quality-adjusted life year (QALY). The next most cost-effective drug was thalidomide with an ICER of 10,706,411 baht per additional QALY. Finally, lenalidomide was the least cost-effective drug with an ICER of 12,009,328 baht per QALY gained but it also provided the most QALY gained. The threshold analysis results showed that thalidomide, and lenalidomide will be cost-effective once their prices (per two months) are decreased to 3,667 baht (94%), and 7,930 baht (98%), respectively. For bortezomib, although prices of medication are decreased zero, it will not cost-effective in Thai context. Finally, the budget impact that will occur over a 5-year period from the budget holder

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