

Cost-effectiveness of pegfilgrastim *versus* six days of filgrastim for preventing febrile neutropenia in breast cancer patients

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ABSTRACT

Aims and background. Febrile neutropenia (FN) is a major complication of chemotherapy and is associated with substantial morbidity, mortality and costs. The aim of this study was to evaluate the cost-effectiveness of primary prophylaxis with pegfilgrastim *versus* six-day filgrastim in preventing FN in Italian patients with early-stage breast cancer receiving adjuvant chemotherapy associated with a $\geq 20\%$ FN risk.

Methods. The pharmacoeconomic evaluation was based on a decision-analytic model taking into account the possible consequences of FN (e.g., death and reduction/delay of chemotherapy dose). Parameters included in the model were relative risk of FN with pegfilgrastim *versus* six-day filgrastim; direct costs (drug purchase and FN-related hospitalizations); relative risk of relative dose intensity $< 85\%$ with pegfilgrastim *versus* filgrastim; impact on long-term survival due to relative dose intensity $< 85\%$; and impact of age on FN and relative dose intensity $< 85\%$.

Results. Under base-case assumptions, pegfilgrastim was cost-effective compared to six-day filgrastim in Italy. The estimated cost, life expectancy and quality-adjusted life years per person for pegfilgrastim were € 3078, 16.47 years, and 15.32; the corresponding figures for six-day filgrastim were € 3033, 16.35 years, and 15.22. The corresponding incremental cost-effectiveness ratio with pegfilgrastim was € 409 per life-year gained and € 429 per quality-adjusted life year gained. One-way sensitivity analyses showed that the results were most sensitive to the relative risk of FN for 6-day filgrastim *versus* pegfilgrastim. The results were moderately sensitive to the cost of pegfilgrastim and filgrastim, cost of drug administration, cost of FN hospitalization, and number of chemotherapy cycles. Pegfilgrastim remained cost-effective, with an incremental cost-effectiveness ratio well below the accepted limit of € 50,000 per life year gained in all one-way sensitivity analyses. A two-way sensitivity analysis on cost of drugs showed a range of pegfilgrastim dominance over six-day filgrastim.

Conclusions. At the current official price in Italy, primary prophylaxis with pegfilgrastim improved health outcomes with a very limited cost increase for the National Health Service payer. Even when very low prices of filgrastim and high prices of pegfilgrastim were considered in the model, the resulting incremental cost-effectiveness ratio remained well within the acceptable cost-effectiveness limit of € 50,000/quality-adjusted life year.

Key words: cost-effectiveness, febrile neutropenia, filgrastim, pegfilgrastim.

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