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A Budget Impact Analysis on the Prophylactic Use of Biosimilar Pegfilgrastim-bmez in Non-myeloid Cancer Patients at Risk of Chemotherapy-induced Febrile Neutropenia and Its Expanded Use to Intermediate-risk Patients

Background

Febrile Neutropenia (FN) remains one of the most serious and costly, yet one of the most preventable complications of cancer chemotherapy (CT)[1,2]. Current practice guidelines recommend routine primary prophylaxis (PP) with granulocyte-colony stimulating factors (G-CSFs) in patients at high-risk of FN, but not for lower-risk settings (i.e., intermediate risk) owing to cost concerns[2]. However, biosimilar G-CSFs (e.g. pegfilgrastim-bmez) may help reduce drug costs while expanding access to G-CSF PP for patients at intermediate risk of FN.

Objective

To quantify the budget impact (BI) of converting patients from reference pegfilgrastim to biosimilar pegfilgrastim-bmez, and demonstrate expanded access to biosimilar pegfilgrastim-bmez for patients at intermediate risk of FN from a mixed US commercial and Medicare payer perspective.

Methods

BI analyses were conducted in a hypothetical one-million-member health plan over a 5-year time horizon and evaluated the total costs of PP (drug and FN-related healthcare resource utilization [HCRU]) with G-CSF (six cycles in a year) in non-myeloid cancer patients (Tables 1 and 2). Based on published literature, patients were stratified by risk of FN event based on chemotherapy regimens, the percentage of patients in high, intermediate, and low FN-risk categories, as well as those receiving G-CSFs prophylaxis (reference pegfilgrastim, reference pegfilgrastim on-body injector, reference filgrastim, biosimilar pegfilgrastim-bmez, biosimilar filgrastim-sndz). HCRU included emergency room visits, with or without subsequent hospitalizations, and outpatient visits, with or without subsequent hospitalizations.

The current scenario assessed the BI of converting patients from reference pegfilgrastim to biosimilar pegfilgrastim-bmez. The expanded access scenario assessed the BI of expanding the use of PP with biosimilar pegfilgrastim-bmez to 10% more patients in the intermediate FN-risk category, compared to reference pegfilgrastim. Costs for G-CSFs utilization and FN-related HCRU were estimated from publicly available data and literature. All costs have been adjusted to 2020 US dollars.

Results

Clinical Outcomes

- Over a time horizon of 5 years, it is estimated that health plan members will grow to 1,024,991. By 2024, there will be 16,554 patients on chemotherapy, with 7,943 patients in the intermediate FN-risk category, among which 3,949 receiving primary prophylaxis with G-CSF (Figure 1).
- The number of patients treated with biosimilar pegfilgrastim-bmez in the current scenario (2024) is 1,422, with an additional 476 patients on biosimilar pegfilgrastim-bmez in the expanded access scenario (Figure 1). Due to increased prophylaxis, there are 41 fewer ER visits and 20 fewer outpatient visits.

Table 1. Population and Clinical Inputs and Assumptions

Model Parameters	Value
Model population	
Health Plan Members	1,000,000
Population Annual Growth Rate[3]	0.62%
Medicare Health Plan Members	60%
Commercial Payer Health Plan Members	40%
Time horizon	5 Years
Epidemiology	
Non-myeloid cancer prevalence[4]	4.72%
Non-myeloid cancer annual incidence[4]	0.44%
Annual percent of patients with non-myeloid cancers on CT[5]	31.30%
Distribution of non-myeloid cancer patients by FN risk[6]	
High/Intermediate/Low	8.79% / 47.98% / 43.23%
Distribution of G-CSF prophylaxis by FN risk[6]	
Patients at high risk of FN	59%
Patents at intermediate risk of FN (see Figure 1)	29% 39% (Expanded Access)
Patents at low risk of FN	11%
Outcomes	
Risk of FN among patients with G-CSF prophylaxis[7]	
High/Intermediate/Low	7.25% / 5.80% / 1.45%

Table 2. Utilization and Cost Inputs and Assumptions

Model Parameters	Value
Proportion of Biosimilar Pegfilgrastim-bmez use among all G-CSFs	
2020	10%
2021	25%
2022	40%
2023	50%
2024	60%
Resource utilization	
Proportion of FN events resulting in:	
Emergency visit and hospitalization	36%‡
Emergency visit and without hospitalization	4%‡
Outpatient visit and hospitalization	18%‡
Outpatient visit without hospitalization	42%‡
FN-related costs	
Hospitalization[8]	$ 27,155.40
Emergency room visit (no hospitalization)[9]	$ 9,727.96
Outpatient visit[10]	$ 1,664.42
G-CSF utilization and costs	
Number of G-CSF cycles per patient per year	6
Wholesales Acquisition Cost (WAC) of reference pegfilgrastim[11]	$ 6,231.06
WAC cost of the biosimilar pegfilgrastim-bmez	$ 3,925.53
Administration cost of reference pegfilgrastim and biosimilar pegfilgrastim-bmez[11]	$ 16.94
Administration cost of reference pegfilgrastim on-body injector[11]	$ 20.54

‡ *Assumptions based on input from healthcare providers*

Figure 1. Patient Flow by Scenario

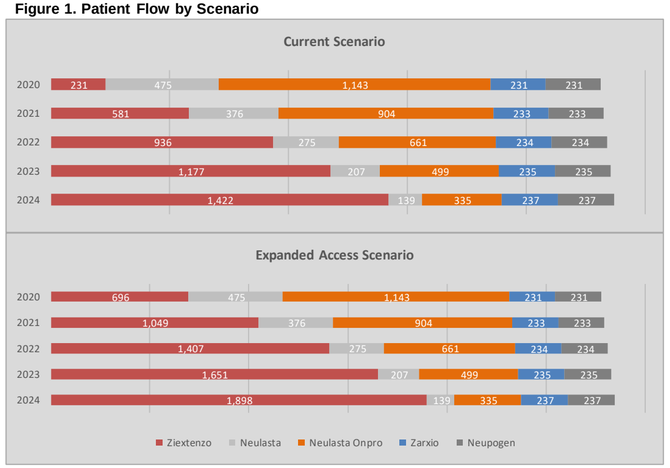


Figure 2. Budget Impact with Conversion to Biosimilar Pegfilgrastim-bmez

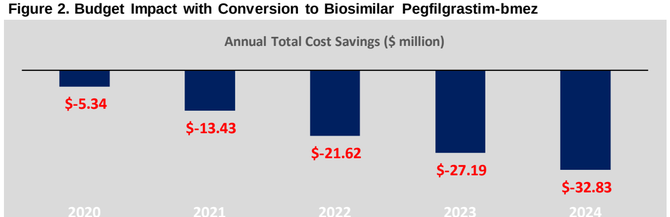
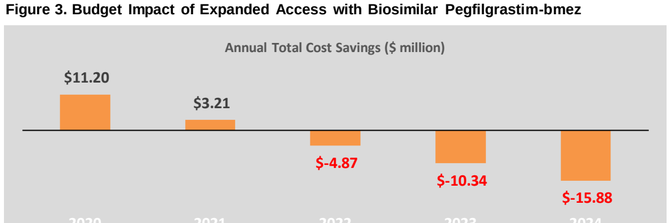


Figure 3. Budget Impact of Expanded Access with Biosimilar Pegfilgrastim-bmez



Results

Budget Impact

- In the current scenario, total costs reduced from an average $161.5 M to $141.4 M with conversion to biosimilar pegfilgrastim. The cost savings range from $5.3 M in 2020 to $32.8 M in 2024 (Figure 2).
- In the expanded access scenario, since there are incremental patients receiving biosimilar pegfilgrastim-bmez, there will be increased spending on drug costs. However, by 2022, cost savings will be achieved due to an increase in the proportion of patients using biosimilar pegfilgrastim-bmez. For drug costs, the cost savings are $3.2 M in 2022 and increase to $14.6 M IN 2024. For HCRU, there are constant cost savings around $1.7 M, due to increased treatment and reduced outcome events. On average, the total cost savings are $16.7 M, when comparing expanded access scenario to reference pegfilgrastim (Figure 3).

Study Limitations

- This model is a simplification of the complex utilization patterns of G-CSF prophylaxis in a hypothetical healthcare plan population
- Based on clinician input, assumptions were made on the annual percent of patients on chemotherapy, the distribution of patients with an emergency or outpatient visit when experiencing an FN event
- The generalization of the model results are limited to the patient scenarios and chemotherapy risk assumptions used in the model
- Assumptions were made to estimate the evolution of pegfilgrastim-bmez utilization rates over the 5 year time horizon

Conclusions

- Converting patients at risk of FN from reference pegfilgrastim to biosimilar pegfilgrastim-bmez is a cost-saving strategy
- Expanding the use of biosimilar pegfilgrastim-bmez to patients at intermediate risk of FN is also cost saving, generating offsets associated with a lower rate of FN-related complications and improving patients outcomes

Disclosures

- This study was funded by Sandoz Inc.

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