Patients Receiving Pegfilgrastim via Prefilled Syringe Received Closer Care When Compared with On-Body Injector

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BACKGROUND

Neutropenia is a common side effect of cancer treatments. Chemotherapy regimens that increase patient's risk of febrile neutropenia (FN) by 18% are classified as high-risk regimens according to NCCN Guidelines[1]. FN can result in high hospital costs and mortality rates. Physicians use multiple neutropenia management strategies that take into account factors such as comorbidities and patient's risk of developing FN. Both short and long acting granulocyte colony-stimulating factors (G-CSF; filgrastim and pegfilgrastim, respectively) are available for neutropenia treatment. Filgrastim and pegfilgrastim use necessitates patients return to the clinic the day after chemotherapy. Introduction of the on-body injector (OBI) allows for the next day delivery of pegfilgrastim without patients having to come back to the clinic.

Use of pegfilgrastim in patients who are at high risk of FN results in a 94% reduction in FN. Studies have shown that pegfilgrastim use is associated with increased chemotherapy relative dose intensity (RDI) due to fewer dose reductions, delays and discontinuations[2]. Maintaining RDI has been associated with increased survival in ER+/PR+, HER2- (>85% RDI) and TNBC (>75% RDI) patients[3].

To better understand the impact of pegfilgrastim use on the quality of care, we conducted a study comparing neutropenia rates, dose delays and total cost of care in breast cancer patients undergoing chemotherapy. The study compared patients with high-risk of febrile neutropenia, who received (1) no pegfilgrastim, (2) pegfilgrastim via pre-filled syringe (PFS), (3) pegfilgrastim via OBI.

METHODS

The data utilized for this study came from the EHRs, practice management systems, and CMS claims obtained as part of the Oncology Care Model (OCM) for eight practices supported by Integra Connect Population Health. Using a harmonized data model, DTX, we constructed synthetic chemotherapy episodes of care. This study only included breast cancer chemotherapy regimens whose use is associated with high-risk (>18%) of developing FN per NCCN Guidelines. Each episode began with an administration of such a chemotherapy regimen. The episode ended the day of the next chemotherapy administration, or after 14 days if no subsequent chemotherapy was given.

Each episode was assigned to a cohort, no pegfilgrastim, pegfilgrastim via PFS, or pegfilgrastim via OBI.

Matched-Cohort Analysis

To evaluate the efficacy and toxicity associated with pegfilgrastim administration, we conducted a matched-cohort analysis. Patients were matched based on age, sex, cancer type, number of comorbidities, regimen, chemotherapy start date (within 90 days), whether the administration was the last cycle of chemotherapy, and OCM provider quality metrics (OCM-1, -2 and -3: hospitalization, ED Visit and hospice rates, respectively).

Neutropenia Rates

Neutropenia rates were defined as the percent of chemotherapy administrations that were followed by an absolute neutrophil count (ANC) ≤ 500.

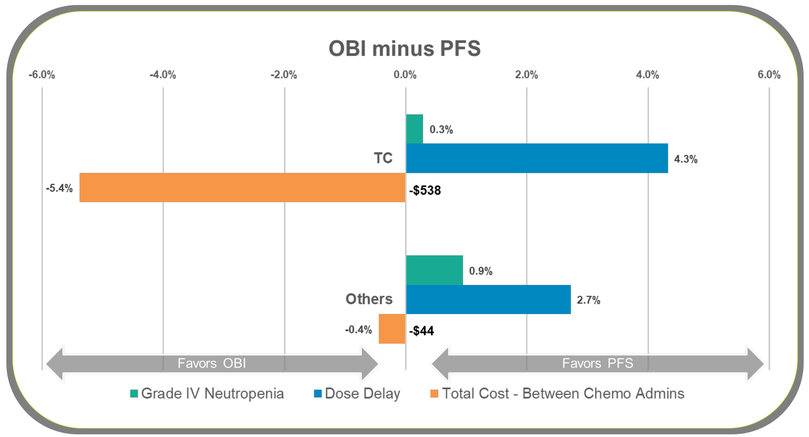
Dose Delay

For each patient, regimen combination, the median days between chemotherapy administrations was calculated. An individual administration was considered delayed if the time between administrations was ≥ 120% of the median.

Cost of Care

The total cost of care was calculated using OCM claims data, for those patients in OCM episodes. The total cost of care was defined as all Medicare reimbursement during the chemotherapy administration episode, excluding the cost of chemotherapy and pegfilgrastim, so the costs are representative of the care that patients received between chemotherapy administrations, including any office visits, labs, hospitalizations, ED visits, etc.

RESULTS



When comparing patients who received pegfilgrastim with OBI, patients with PFS had 0.3% less grade IV neutropenia (p=0.47) and 5.3% fewer dose delays (p=0.009) at an additional cost of $518 per chemotherapy administration (p=0.002, n=2,727 in each arm).

(not pictured) Compared with no pegfilgrastim, PFS episodes had 9.9% less grade IV neutropenia (ANC < 500, p < 0.001), 5.6% fewer dose delays (p=0.0014) and $414 higher total cost of care (p < 0.001, n=916 in each arm).

Compared with no pegfilgrastim, PFS episodes had 9.9% less grade IV neutropenia (ANC < 500),5.6% fewer dose delays, and $414 higher total cost of care (Medicare rates). Compared with OBI, PFS episodes had 0.3% less grade IV neutropenia, 5.3% fewer dose delays, and $538 higher total cost of care.

Exploratory analysis highlighted differences in physician office and hospital utilization. PFS episodes include more non-chemotherapy office visits than OBI episodes (2.1 vs 1.3), resulting in higher physician reimbursement per episode ($958 vs. $217). PFS patients are more likely to have an unplanned office visit (64% vs 23%) and more likely to receive hydration during an episode (34% vs. 21%).

Conversely, PFS episodes include less hospital utilization compared with OBI episodes. OBI episodes are 23% more likely to include hospitalization resulting in $222 inpatient cost for PFS episodes ($9,624 per admission) and $423 inpatient cost for OBI episodes ($11,211 per admission).

CONCLUSIONS

As expected, this observational real-world analysis shows that the use of pegfilgrastim via PFS or OBI is associated with reduced neutropenia rates and reduced dose delays compared with no pegfilgrastim. Comparing PFS with OBI, we see similar neutropenia rates, but PFS shows fewer dose delays.

Exploratory analysis provides some insight into these dose delays and related health care utilization. Our analysis shows that patients returning next day to the cancer center to receive pegfilgrastim frequently receive other services such as labs and hydration. These services lead to fewer dose delays, perhaps because toxicities other than neutropenia are detected earlier in the episode and can be managed in the office.

This implies that use of PFS may be used as part of a strategy to shift site of service for management of side effects into the physician office and away from hospitals and emergency departments.

We attempted to control for any confounders using the matching strategy described above. However, it is possible that there are other confounding variables that have not been accounted for. Also, cost data was limited to our OCM population, and not available for all patients.

REFERENCES

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