

Risk of hospitalisation for neutropenic complications of chemotherapy in patients with primary solid tumours receiving pegfilgrastim or filgrastim prophylaxis: A retrospective cohort study

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Study overview: Neutropenia, and febrile neutropenia (FN), are frequent and potentially life-threatening complications of myelosuppressive chemotherapy, often resulting in infection and hospitalisation. Administration of granulocyte colony-stimulating factors (G-CSFs) reduces the duration of neutropenia and the risk of FN. Filgrastim is cleared rapidly by the kidneys, so daily weight-based injections are required. Pegfilgrastim is a pegylated filgrastim with neutrophil-regulated clearance, such that it remains in the blood until the neutrophil count recovers. Evidence suggests that the risk of FN during chemotherapy is lower with pegfilgrastim than with filgrastim.

The aim of this retrospective, US health insurance data-base cohort study was to compare the risks of hospitalisation for neutropenic complications observed for two alternative prophylactic strategies, filgrastim and pegfilgrastim, in routine clinical practice.

Unique chemotherapy cycles were identified for each patient who received chemotherapy for a primary solid tumour between January 2003 and December 2005. Cycles in which filgrastim or pegfilgrastim were administered by cycle day 5 (considered to represent prophylaxis) were identified using medical or pharmacy insurance claims and pooled for analysis. The main outcome measure was the incidence of hospitalisation for neutropenic complications and this was assessed using three criteria: narrow criterion (hospitalisation with diagnosis of neutropenia), broad criterion (hospitalisation with diagnosis of neutropenia, fever or infection), or hospitalisation for any reason.

Key findings:

18,799 patients were identified who received a course of chemotherapy and claimed for either **filgrastim or pegfilgrastim G-CSF prophylaxis**.

- Filgrastim was used in 1,193 unique cycles and pegfilgrastim was used in 14,570 unique cycles.
- The mean age of **patients receiving filgrastim or pegfilgrastim, was 61 and 60 years**, respectively.
- The **most common tumour types** in filgrastim and pegfilgrastim recipients, were **breast cancer** (52% and 51%), and **non-Hodgkin lymphoma** (21% and 18%).
- The mean (\pm SD) **duration of filgrastim prophylaxis** in the final sample was **4.5 days** (\pm 3.3).
- 94% of patients received filgrastim prophylaxis for < 10 days, and 79% of patients received < 7 days filgrastim prophylaxis.

The risks of hospitalisation were consistently lower for chemotherapy cycles that involved pegfilgrastim prophylaxis compared with filgrastim.

- Hospitalisation due to **narrow criterion was less common in pegfilgrastim cycles** (1.2%; unadjusted odds ratio [OR] 0.55; $p = 0.005$) than filgrastim cycles (2.1%).

- Hospitalisation **for broad criterion was less common during pegfilgrastim cycles** (3.1%) than filgrastim cycles (4.5%; unadjusted OR 0.64; $p = 0.002$).
- **Hospitalisation for any reason was less frequent with pegfilgrastim prophylaxis** (6.3%), than with filgrastim prophylaxis (8.7%; unadjusted OR 0.70; $p = 0.001$).
- After adjusting for patient, cancer and chemotherapy characteristics, pegfilgrastim support reduced the likelihood of hospitalisation for neutropenic complications under all criteria compared with filgrastim (adjusted ORs 0.64 – 0.73; $p < 0.05$).

Conclusions: This retrospective, cohort study confirmed that the incidence of hospitalisation due to neutropenic complications during chemotherapy in routine clinical practice was approximately one third lower in patients who received pegfilgrastim prophylaxis compared to filgrastim prophylaxis. It also confirmed that length of treatment with filgrastim prophylaxis was considerably shorter in clinical practice, than in clinical trials. Additional research, in other community-practice populations, is required to further elucidate patterns of G-CSF prophylaxis, and the relationships between these patterns and the comparative effectiveness of pegfilgrastim and filgrastim.

<http://www.ncbi.nlm.nih.gov/pubmed/19539108>