

# Pegfilgrastim-Induced Pain in Patients With Lymphoma

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A 56-year-old Caucasian woman named Ms. P was diagnosed with diffuse large-cell lymphoma with aggressive features. Her presenting symptoms included fever, weight loss, and drenching night sweats, with disease present in mesenteric, inguinal, and axillary lymph nodes as well as in her bone marrow. Ms. P has multiple comorbidities including diabetes, hypertension, gout, osteoarthritis, and hyperlipidemia. Ms. P presented to the clinic to discuss treatment options. Her oncologist recommended chemotherapy with rituximab, etoposide, prednisone, vincristine, cyclophosphamide, and doxorubicin (R+EPOCH) for six cycles with intrathecal chemotherapy prophylaxis and pegfilgrastim support. Ms. P agreed with the treatment plan and was admitted to receive chemotherapy. She tolerated the treatment well without any significant side effects or adverse events. She was discharged and returned to clinic after 24 hours to receive the pegfilgrastim.

Ms. P did well until two days later when she developed severe bilateral flank pain. She called her sister, who told her that she might have kidney stones. Ms. P took tramadol 50 mg orally to ease the pain but had no relief. She was taken to a local emergency room for evaluation. Her vital signs upon arrival were a temperature of 99.8°F, blood pressure of 140/90 mmHg, pulse of 120 bpm, oxygen saturation level of 95% on room air, and respirations of about 20 breaths per minute. Physical examination revealed clear lungs, a nontender abdomen, and no flank tenderness. She had no evidence of trauma and was neurologically intact. Ms. P was given hydromorphone 2 mg via IV, but received minimal relief. Urinalysis, urine culture, basic metabolic panel, and complete blood count were obtained, as well as chest x-ray, bilateral renal ultrasonography, IV pyelography, and computed tomography of the abdomen and pelvis with attention to the kidneys, ureters, and bladder. Urinalysis and microscopy revealed no infection or crystals. The basic metabolic panel revealed normal electrolytes but with slightly elevated uric acid (7.5 mg/dl). The complete blood count revealed a hemoglobin level of 9.3 g/dl, platelet count of 85 K/mcl, and white blood cell count of 32.2 K/mcl, with absolute neutrophil count of 25.5 K/mcl. All imaging studies revealed no acute process. Because of the elevated white blood cell count, blood cultures were obtained and broad-spectrum antibiotics were ordered. Ms. P was kept overnight for observation. The pain persisted and a pain service was consulted. After obtaining additional history, the pain consultant determined that the location of Ms. P's pain was the bilateral iliac crests and was related to the pegfilgrastim. Ms. P was given a dose of ibuprofen and, after a few hours, she reported improvement of her pain. She was later discharged home.

Ms. P returned to her oncologist for clinical evaluation prior to the second cycle of chemotherapy. She reported her "bad experience" and said that she was "scared to death" about taking another dose of pegfilgrastim. Her oncologist reassured her that preventative measures can be taken to prevent the bone pain. After the oncologist explained to her how pegfilgrastim works, why it causes pain, and how the pain can be prevented, Ms. P agreed to take it. He also explained that the use of ibuprofen is not recommended for her subsequent cycles of chemotherapy because of its effects on platelets and that it can mask fevers. Ms. P was admitted to the hospital for her second cycle of chemotherapy but, this time, she was started on cetirizine the day she received pegfilgrastim and took 10 mg orally daily for 10 days. She had no further significant pain related to pegfilgrastim.

## Pegfilgrastim

Pegfilgrastim is indicated to decrease the incidence of infection as manifested by febrile neutropenia in patients with nonmyeloid malignancies receiving myelosuppressive chemotherapy associated with a clinically significant incidence of febrile neutropenia (Amgen Inc., 2011). The American Society of Clinical Oncology and the National Comprehensive Cancer Network (NCCN) recommend first- and subsequent-cycle colony-stimulating factors for myelosuppressive chemotherapy regimens with about a 20% or greater risk of febrile neutropenia (NCCN, 2013; Smith et al., 2006). Treatment- and patient-related risk factors for febrile neutropenia include

- Chemotherapy with a 20% or greater risk of febrile neutropenia
- Being older than age 65 years
- Having comorbidities such as chronic lung disease, diabetes, and cardiac disease
- Being diagnosed with advanced-stage cancer
- Having a poor performance status
- Having concurrent renal or liver dysfunction or concurrent infection, wound, or surgery
- Undergoing prior radiation or myelosuppressive therapy
- Having preexisting neutropenia or bone marrow involved with tumor (NCCN, 2013).

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