

Neutropenic Fever Following Chemotherapy in a Patient With Lymphoma

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C.L., a 72-year-old woman diagnosed with stage II diffuse large B-cell lymphoma, had a medical history of hypertension and hypothyroidism, which was treated with lisinopril 20 mg daily and levothyroxine sodium 0.125 mg daily. Her treatment plan consisted of six cycles of rituximab 375 mg/m² IV on day 1, cyclophosphamide 750 mg/m² IV on day 1, doxorubicin 50 mg/m² IV on day 1, vincristine 1 mg IV on day 1, and prednisone 100 mg orally on days 1–5, followed by 30 Gy of radiation therapy. C.L. had a teaching session with the nurses in the infusion center at her hematologist's office one week prior to chemotherapy to help her understand the treatment, the expected side effects, and when to contact a healthcare provider.

Following the teaching session, C.L. continued with her preparation for chemotherapy. Her complete blood count revealed that hematocrit was 39.2% (normal range = 35%–47%), hemoglobin was 13 g/dl (normal range = 12–15 g/dl), white blood cell count was 6,000/mm³ (normal range ≥ 1,500/mm³), absolute neutrophil count was 3,000/mm³ (normal range = 1,500–4,500/mm³), and platelet count was 250,000/mm³ (normal range = 150,000–400,000/mm³). Chemistry panel results were within normal limits. C.L. had a Hickman catheter placed before beginning chemotherapy. She received her first dose of chemotherapy without complications at the infusion center in her hematologist's office. She received a pegfilgrastim injection 24 hours later to prevent severe neutropenia.

C.L. returned to see the nurses at the infusion center one week after her chemotherapy. She reported nausea (relieved by oral metoclopramide 10 mg) in the first two days after treatment. Her hematocrit was 37.8%, hemoglobin was 12 g/dl, white blood cell count was 4,000/mm³, absolute neutrophil count was 1,500/mm³, and platelet count was 230,000/mm³. An absolute neutrophil count of 1,000–1,500/mm³ is classified as grade 2 neutropenia (Cancer Therapy Evaluation Program, 2006). C.L.'s vital signs were stable, and her electrolytes were within normal limits. The hematologist prescribed ciprofloxacin 500 mg orally twice daily for prophylaxis against gram-negative and gram-positive infections (Zitella et al., 2005). The hematologist and nurses reviewed neutropenic precautions with C.L. and instructed her to call if she had any signs or symptoms of infection. C.L. said that she understood.

C.L. returned to the infusion center for a nurse evaluation the next week. Her hematocrit was 37.2%, hemoglobin was 11.9 g/dl, white blood cell count was 2,900/mm³, absolute neutrophil count was 400/mm³, and platelet count was 230,000/mm³. An absolute neutrophil count of less than 500/mm³ is defined as grade 4 neutropenia (Cancer Therapy Evaluation Program, 2006). C.L.'s temperature was 101°F, and her heart rate was 100 beats per minute. She reported that her temperature was 100.5°F the prior evening and 100.8°F an hour before her arrival at the office. She did not report either temperature because of the scheduled office visit. C.L. felt fatigued

but had no other signs or symptoms of infection. The hematologist admitted her to the inpatient oncology unit for management of neutropenic fever.

How is the condition assessed and what are the interventions?

C.L.'s condition began to deteriorate after admission. Her temperature rose to 101.5°F, her heart rate was 110 beats per minute, and her blood pressure was 90/50 mmHg. C.L.'s nurse drew two sets of blood cultures, one from the Hickman catheter and one from a peripheral vein. She also collected a urine sample. C.L.'s absolute neutrophil count continued to drop to a nadir of 100/mm³. C.L. received cefepime 2 g IV and normal saline 500 ml bolus after which continuous normal saline at a rate of 125 ml per hour was initiated. C.L. continued to receive IV cefepime and oral ciprofloxacin every 12 hours. In an effort to prevent cephalosporin-induced *Clostridium difficile*, C.L. began oral saccharomyces boulardii. Her vital signs improved after the antibiotics and IV fluids, and a chest x-ray ruled out pneumonia. An infectious disease consultation was requested, leading to the initiation of vancomycin 500 mg IV every 12 hours.

The urine culture and chest x-ray were negative. The blood cultures from the Hickman catheter and peripheral vein site were positive for *Staphylococcus aureus*. Vancomycin therapy was increased to 1 g every 12 hours. C.L.'s Hickman catheter was removed by an interventional radiologist, and she continued to receive antibiotics through a peripheral vein.

Do You Have an Interesting Clinical Experience to Share?

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Digital Object Identifier: 10.1188/08.ONF.885-887