Midostaurin

Nursing perspectives on managing treatment and adverse events in patients with *FLT3* mutation–positive acute myeloid leukemia and advanced systemic mastocytosis

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BACKGROUND: Acute myeloid leukemia (AML) and advanced systemic mastocytosis (SM) are clonal diseases of the blood. Prognoses for patients with *FMS-like tyrosine kinase 3* (*FLT3*) mutation–positive AML and those with advanced SM are poor. In the United States, midostaurin was approved in 2017 in combination with standard chemotherapy in patients with newly diagnosed *FLT3* mutation–positive AML and as a single agent in patients with advanced SM.

OBJECTIVES: This article aims to improve oncology nurses' knowledge about the benefits and risks of midostaurin therapy and to provide guidance on the identification and management of eligible patients.

METHODS: The clinical data that supported the U.S. Food and Drug Administration's approval of midostaurin are reviewed, and supporting safety and management considerations are provided based on the authors' experiences as nurses and advanced practice providers caring for patients who received midostaurin during these key clinical trials.

FINDINGS: Nausea and vomiting are the most frequent nonhematologic adverse events reported with midostaurin; therefore, administer midostaurin with antiemetics, and recommend taking it with food. Care should be taken when midostaurin is coadministered with strong CYP3A4 inhibitors.

KEYWORDS
FLT3 mutation; acute myeloid leukemia; midostaurin; advanced systemic mastocytosis

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ACUTE MYELOID LEUKEMIA (AML) AND ADVANCED SYSTEMIC MASTOCYTOSIS (SM) are clonal blood disorders (Fey, 2007; Valent et al., 2003). In AML, proliferating myeloid cells no longer differentiate, resulting in decreased production of red blood cells, white blood cells, and platelets (Fey, 2007). In advanced SM, proliferating abnormal mast cells (a type of white blood cell) accumulate in various organs, resulting in organ damage (DeAngelo et al., 2018; Fuller, 2012; Valent, Akin, Hartmann, Nilsson, et al., 2017). Prognoses for patients with AML and advanced SM are bleak. About 27% of adult patients with AML will live for five years (National Cancer Institute, 2019), and the median survival in those with advanced SM ranges from 2 to 41 months, depending on the subtype (Pardanani, 2016).

Midostaurin was approved in 2017 by the U.S. Food and Drug Administration and the European Commission for adult patients with newly diagnosed *FMS-like tyrosine kinase 3* (*FLT3*) mutation–positive AML and advanced SM, including aggressive SM, SM with an associated hematologic neoplasm (SM-AHN), and mast cell leukemia (Novartis Europharm Limited, 2017; Novartis Pharmaceuticals, 2017b).

Disease Background

Acute Myeloid Leukemia

In the United States in 2019, there were an estimated 21,450 new cases of AML (about 30% of all leukemias) (National Cancer Institute, 2019). AML is more common in older adults, with a median age at diagnosis of 68 years, but it can occur at any age (25% for people aged 65–74 years and 4.5% for people aged younger than 20 years) (National Cancer Institute, 2019; Shallis, Wang, Davidoff, Ma, & Zeidan, 2019).

Risk factors for developing AML include environmental factors (e.g., tobacco use, exposure to ionizing radiation and benzene), previous myeloproliferative or myelodysplastic disorders, prior exposure to chemotherapy, and certain genetic conditions (e.g., Bloom syndrome, Diamond-Blackfan anemia, Down syndrome, Fanconi anemia, neurofibromatosis, Noonan syndrome) (Shallis et al., 2019). However, most patients with AML have no identifiable risk factor.

At disease presentation, symptoms may include fatigue and spontaneous bleeding (Kebriaei, de Lima, & Estey, 2008) and may also include weight loss, fever, night sweats, lethargy, and petechiae. The World Health Organization defines AML as the presence of greater than 20% blast cells