Guiding the Management of Acute Promyelocytic Leukemia: A Quality Improvement Project

Lauren Sheldon, DNP, RN, OCN®, AGACNP-BC®, Donna M. Tydings, DNP, RN, CNS-BC, EBP(CH), and Tara L. Sacco, PhD, RN, CCRN®, ACCNS-AG®

BACKGROUND: Despite successful treatment regimens and remission rates of greater than 90%, early death is a concern for patients with acute promyelocytic leukemia (APL). The challenges surrounding proper care for APL are centered on the low volume of patients, which limits healthcare professionals' knowledge of disease management.

OBJECTIVES: The purpose of this project was to develop resources and present an educational module specific to managing patients newly diagnosed with APL. An intervention to evaluate bedside nurses' knowledge of APL was implemented.

METHODS: Thirty-four RNs were recruited for participation. A clinical practice guideline, an algorithm, and a fact sheet were developed to provide resources for providers. An educational module was presented to the RNs to increase their knowledge of APL. Pre- and postintervention surveys were created to assess knowledge and confidence before and after the intervention.

FINDINGS: Thirty-four RNs completed the module, and 27 participated in the pre- and postintervention surveys. Mean knowledge test scores increased significantly from 7.19 preintervention to 14.04 postintervention ($p < 0.001$).

KEYWORDS
guideline; evidence-based practice; quality improvement; acute leukemia

DIGITAL OBJECT IDENTIFIER
10.1188/24.CJON.389-396

ACUTE PROMYELOCYTIC LEUKEMIA (APL) IS A RARE SUBTYPE of acute myeloid leukemia characterized by the cytogenetic translocation of chromosomes 15 and 17, leading to the fusion of the promyelocytic leukemia (*PML*) and retinoic acid receptor alpha (*RARA*) genes (Thomas, 2019). In APL, promyelocytes pack in the peripheral blood, and there is a noteworthy propensity for bleeding caused by fibrinolysis and thrombocytopenia (Thomas, 2019). The clinical course is rapid, often ending within weeks of diagnosis, making APL the most malignant form of acute leukemia (Hillestad, 1957). However, highly effective treatment regimens, consisting of chemotherapy and drugs like all-trans retinoic acid (ATRA) and arsenic trioxide (ATO), have aided in APL's clinical course, making it one of the most curable forms of cancer (Jillella & Kota, 2018; Sheldon, 2022). With the use of such targeted therapies, long-term overall survival rates are achievable in more than 90% of patients (Schuh, 2022).

Despite the ability to cure APL, early deaths during induction therapy remain a significant issue (Jillella & Kota, 2018; National Cancer Institute, 2018; Schuh, 2022). Early death is classified as death within one month of APL diagnosis (Zhu et al., 2021). Induction mortality rates range from 10% to 30% and have remained an unresolved issue in the past two decades (Jillella & Kota, 2018). Most early deaths occur within the first 7–10 days postdiagnosis and are often related to hemorrhage (Larson & Gurbuxani, 2022).

Coagulopathy

The coagulopathy of APL is complex and is a hallmark feature of the disease. About 90% of patients display some variation of bleeding on presentation (Ten Cate & Leader, 2021). Disseminated intravascular coagulation (DIC) and primary hyperfibrinolysis are often present at diagnosis or occur soon after therapy is initiated (Larson & Gurbuxani, 2022). Symptoms can include atypical bleeding, clots, bruising, hypotension, and respiratory distress (Ten Cate & Leader, 2021). Bleeding constitutes a medical emergency for patients with APL. If left untreated or poorly managed, early hemorrhagic death rates from APL can reach upwards of 60%, primarily caused by pulmonary or cerebrovascular hemorrhage (Larson & Gurbuxani, 2022).

Differentiation Syndrome

An additional contributor to early death in patients with APL is differentiation syndrome, originally known as retinoic acid syndrome. About 25% of patients with APL treated with ATRA and/or ATO experience differentiation syndrome (Larson & Bag, 2023). In APL, the combination of ATRA and