Hyperglycemia and Cancer

An algorithm to guide oncology nurses

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BACKGROUND: A dual diagnosis of cancer and hyperglycemia has demonstrated untoward effects on patients' cancer treatment, prognosis, and survival.

OBJECTIVES: The purpose of this evidence-based project is to improve knowledge and awareness of the consequences of hyperglycemia in patients with cancer, increasing nurses' capability to effectively intervene. In addition, a clinical algorithm based on current evidence was developed and is presented.

METHODS: An educational program was developed and pilot tested. The program addressed the etiology of hyperglycemia and its effects on patients with cancer. Knowledge of hyperglycemia in patients with cancer was assessed with a pre- and post-test.

FINDINGS: All participants found the educational program effective and deemed the clinical algorithm useful. Results improved significantly after participation in the educational intervention.

KEYWORDS
professional development; nurse education; diabetes; cancer; hyperglycemia

DIGITAL OBJECT IDENTIFIER
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ABOUT 8%–18% OF INDIVIDUALS WITH CANCER HAVE PREEXISTING DIABETES at the time of diagnosis (Barone et al., 2008; Hammer & Voss, 2012; Hershey et al., 2014). Cancer therapies, including chemotherapeutic, biologic, and hormonal agents, have the potential to cause hyperglycemia (Hershey et al., 2014). Researchers have found that patients with elevated fasting blood glucose (FBG) levels and body mass index (BMI) have a reduced time to tumor progression (Pantano et al., 2013). Elevated FBG and BMI are not only predictive factors for time to progression (Pantano et al., 2013), but also are risk factors for diabetes (American Diabetes Association [ADA], 2015).

Oncology nurses need information and resources to guide them in providing care to patients at risk for hyperglycemia. Identifying modifiable and nonmodifiable risk factors for hyperglycemia, understanding how cancer treatments can affect glycemic control, and recognizing potential cancer-related and non–cancer-related complications of hyperglycemia are important to providing the best possible care to patients at risk for hyperglycemia. However, these types of resources may not be readily available to nurses across treatment settings. The goal of this article is to provide information and resources to help guide oncology nurses caring for individuals with, or at risk for, hyperglycemia.

Review of the Literature

Diabetes mellitus is a group of metabolic disorders that share one common trait, hyperglycemia. Many factors contribute to an individual's hyperglycemic state, including decreased insulin production, decreased glucose uptake, and an increase in glucose secretion (Powers, 2015a). Type I diabetes is an autoimmune disorder that causes destruction of pancreatic beta cells. The destruction of insulin-producing beta cells causes individuals to be dependent on exogenous insulin (Powers, 2015a). Type II diabetes accounts for more than 95% of all diagnosed cases (Giovannucci et al., 2010). It is characterized by insulin resistance, impaired insulin secretion, and increased glucose production (Powers, 2015a). A long, asymptomatic phase often occurs before a diagnosis is made (ADA, 2015). Prediabetes is a condition associated with impaired fasting glucose and impaired glucose tolerance (McCance & Huether, 2010). Hammer et al. (2015) found that 26% of patients with cancer undergoing cancer treatment for solid tumors had prediabetes.

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