Impact of Malglycemia on Clinical Outcomes in Hospitalized Patients With Cancer: A Review of the Literature

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Malglycemia has been shown to affect critical- and noncritical-care patient populations. Malglycemia is defined as hypoglycemia (blood glucose less than 70 mg/dl), hyperglycemia (blood glucose of 126 mg/dl or greater), or glycemic variability (standard deviation of two or more blood glucose measurements of 29 mg/dl of greater) (Hammer et al., 2009). Among critically ill patients, researchers have found that malglycemia is associated with increased incidence of infection or sepsis (Benfield, Jensen, & Nordestgaard, 2007), longer inpatient lengths of stay (Krinsley, 2004), and increased morbidity and mortality (Kreutziger, Schlaepfer, Wenzel, & Constantinescu, 2009; Krinsley, 2004; Umpierrez et al., 2002; Van den Berghe et al., 2001). Noncritical-care patients with elevated glucose on hospital admission also have demonstrated poorer outcomes such as increased urinary tract infections, strokes, hemorrhaging, other infections, ileus, increased length of stay, venous thromboembolism (Carr, 2001; Mraovic et al., 2010), and mortality (Kent, Soukup, & Fabian, 2001; Marchant, Viens, Cook, Vail, & Bolognesi, 2009). In addition, patients with hyperglycemia during hospitalization are less likely to be discharged directly home (Umpierrez et al., 2002).

Malglycemia may be particularly important to patients with cancer. Hyperglycemia has been shown to facilitate a physiologic environment that promotes tumor cell proliferation (Barone et al., 2008). Researchers also have noted that hyperglycemia can increase reactive oxidative stress, resulting in structural changes to the endothelial cells and increasing the likelihood of metastasis (Barone et al., 2008), and that high levels of glucose may aid malignant cells in resistance to apoptosis (normal programmed cell death) (Zeng et al., 2010). In addition, the frequent use of steroids and total parenteral nutrition (TPN) as part of the treatment and symptom management plan potentially place the patient at a higher risk for malglycemia and subsequent

Purpose/Objectives: To examine empirical research regarding the role of malglycemia (hyperglycemia, hypoglycemia, or glycemic variability) on clinical outcomes among hospitalized patients with cancer.

Data Sources: Research articles were obtained from the Ovid, PubMed, and CINAHL® databases. Key words used in the search included *hyperglycemia* or *malglycemia* and *neoplasm* combined with *venous thromboembolism*, *infection*, or *mortality*.

Data Synthesis: Eleven research articles were examined reporting the impact of malglycemia on various outcomes, including infection, mortality or survival, length of hospital stay, and toxicity.

Conclusions: Findings suggest that malglycemia may have a negative impact on outcomes for hospitalized patients with cancer. Increased rates of infection, mortality, length of stay, and toxicities, as well as decreased survival, were reported.

Implications for Nursing: Oncology nurses play an important role in the identification of patients with malglycemia. Early assessment and intervention for those patients can improve outcomes and quality of life.

adverse outcomes. However, little is known about malglycemia in patients with cancer. Therefore, the purpose of this article is to examine the impact of malglycemia on clinical outcomes in patients with cancer. Findings from this review will be used to understand the relationships between malglycemia and outcomes in hospitalized patients with cancer to improve clinical outcomes and identify areas for future research.

Data Sources

A review of the literature regarding malglycemia was conducted using the Ovid, PubMed, and CINAHL® databases. Key search terms included *hyperglycemia* or *malglycemia* and *neoplasm* combined with *venous thromboembolism*, *infection*, or *mortality*. The terms were used as key words and Medical Subject Heading terms to