Glycemic Variability in Patients With Stage II–III Colon Cancer Treated With Surgery and Adjuvant Chemotherapy

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OBJECTIVES: To examine glycemic variability within one month and one year following surgery and throughout adjuvant chemotherapy among patients with stage II–III colon cancer, with and without type 2 diabetes (T2D).

SAMPLE & SETTING: 58 patients with stage II–III colon cancer treated with surgery and chemotherapy.

METHODS & VARIABLES: A retrospective analysis of electronic health record data over one year showed glycemic variability, measured as standard deviation and coefficient of variation. Chi-square, Fisher's exact, and Mann–Whitney U tests and Spearman's correlation coefficient were calculated.

RESULTS: Patients with T2D had higher glycemic variability throughout chemotherapy and within one year following surgery. A significant increase in glycemic variability throughout chemotherapy was observed in patients without T2D. Significant associations between glycemic variability and demographic and clinical characteristics differed by T2D status, standard deviation, and coefficient of variation.

IMPLICATIONS FOR NURSING: Nurses need to assess serial blood glucose levels in patients with and without T2D. Teaching patients how to maintain glycemic control during treatment is a priority. Research should include predictive models to identify risk factors for higher glycemic variability and cancer-related symptoms and outcomes.

KEYWORDS chemotherapy; colon cancer; glucose; glycemic variability; steroids; surgery

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Patients with cancer, with and without type 2 diabetes (T2D), are known to experience hyperglycemia, which has been associated with poor cancer-related outcomes (Hammer et al., 2019; Healy et al., 2017; Simon et al., 2018; Zylla et al., 2019). Therefore, glycemic control is essential for improving outcomes in patients with cancer. The incidence of T2D in the U.S. general population is 10.5% (Centers for Disease Control and Prevention, 2020), yet diabetes (types 1 and 2) have been reported to occur in 21.94% of patients with early-stage (stage I–II) colon cancer (Lee et al., 2020). Importantly, prior to a cancer diagnosis, patients with T2D have a 27% higher risk of developing colon cancer, the fourth most diagnosed cancer in the United States (American Cancer Society, 2021), compared to individuals without T2D (González et al., 2017). In addition, patients with T2D and colorectal cancer have a 17% increased risk of all-cause mortality and a 12% increased risk of cancer-specific mortality (Mills et al., 2013). Of further concern, the rate of T2D in the United States is expected to rise from 35.6 million cases in 2015 to 54.9 million by 2030 (Rowley et al., 2017), and the rates of individuals with T2D and cancer will also increase.

There are no established, specific guidelines for glycemic management in patients with cancer with and without T2D. Hemoglobin A1c (HbA1c), the most commonly used assessment of glycemic status, provides a value that reflects a two- to three-month average of blood glucose (American Diabetes Association, 2021). However, HbA1c does not capture glycemic variability, described as fluctuations in blood glucose. In addition, HbA1c measures may be inaccurate in patients with cancer because of the malignancy, acute blood loss from surgery, and the apoptotic effect of chemotherapy on the life of