Hypertension in the Oncology Setting

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Case Presentation

K.A. is a 56-year-old African American female with a history of colorectal carcinoma with metastasis to her liver. She presents to the clinic for her fifth cycle of biweekly 5-fluorouracil, leucovorin, and oxaliplatin (FOLFOX) and bevacizumab (Avastin®, Genentech BioOncology, South San Francisco, CA). Overall, she has been tolerating the treatment with minimal toxicity.

Past medical history is significant for obesity, prediabetes, and hypertension (HTN). Her blood pressure (BP) is controlled in a range of 130/80 mmHg by hydrochlorothiazide 25 mg daily. Review of systems is normal except for HTN. BP has remained within desired range of 130/80 mmHg by hydrochlorothiazide 25 mg. Today her BP is 162/92 mmHg.

Definition

By definition, BP is the product of cardiac output and peripheral vascular resistance (BP = cardiac output x peripheral resistance). HTN is caused by an increase in cardiac output, peripheral resistance, or both. Cardiac output may be increased by any condition that raises heart rate or stroke volume, whereas peripheral resistance is increased by any factor that raises blood viscosity or reduces vessel diameter (Brashers, Haak, & Richardson, 1998). Therefore, variation in extracellular fluid volume, the contractile state of the heart, and vascular tone determine the variation in BP level (Schwartz & Sheps, 2004).

Pathophysiology

Several hypotheses for the pathogenesis of essential HTN exist. Some of these include high dietary sodium intake and defects in renal sodium excretion, increases in blood volume, inappropriate autoregulation, overstimulation of sympathetic neural fibers in the heart and vessels, and hormonal inhibition of sodium-potassium transport across cell walls in the kidneys and blood vessels (Brashers et al., 1998).

Secondary HTN is caused by a systemic disease process that raises either peripheral vascular resistance or cardiac output. Renal, endocrine, vascular, and neurologic disorders; acute stresses (e.g., surgery, hyperventilation); and drugs may elevate BP. If the cause of the elevation is removed before permanent structural changes occur, BP should return to normal (Onusko, 2003).

Patients with cancer are at risk for HTN secondary to a number of causes, including currently take antihypertensive medications or have received recommendations from a physician to initiate treatment (Centers for Disease Control and Prevention, 2004). This equates to about one in three U.S. adults with high BP.

The American Cancer Society (2005) estimated that one in three Americans can expect to be diagnosed with cancer in their lifetime. The overlap between these two serious and often chronic conditions is significant.

Incidence and Epidemiology

HTN has been found in more than half of people older than 65 years (Kaplan, 1998b). As many as 65 million individuals with HTN currently take antihypertensive medications or have received recommendations from a physician to initiate treatment (Centers for Disease Control and Prevention, 2004). This equates to about one in three U.S. adults with high BP.

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