Online Exclusive Article

Head's Up on the Treatment of Malignant Glioma Patients

Terri S. Armstrong, PhD, ANP-BC, FAANP

2009 Oncology Nursing Society Clinical Lectureship

Primary brain tumors are rare. As a consequence, oncology nurses may not be familiar with the spectrum of diagnoses within this group and the impact that diagnosis has on prognosis and treatment of these tumors. Although typically associated with a poor prognosis, recent advances have been made in the diagnosis and treatment for these tumors that generates great optimism for continued improvements in patient outcomes. This article will provide an update and review of the care and treatment of patients with the most common type of tumor, glial malignancies.

Primary brain tumors are those that arise from the constituent elements of the central nervous system. Relatively uncommon, it was estimated that 51,410 new cases of primary nonmalignant and malignant brain tumors were diagnosed in 2007 (Central Brain Tumor Registry of the United States [CBTRUS], 2008). Primary malignant tumors represent a substantial proportion of these tumors, with 22,070 new cases diagnosed in the United States in 2007 (12,010 in men, 10,060 in women). This number represented 1.36% of all cancers diagnosed each year. However, an estimated 12,930 deaths will be attributed to primary brain tumors in the United States, representing 2.5% of all cancer deaths (American Cancer Society [ACS], 2009). Primary tumors are not only associated with significant mortality, but patients often have devastating neurologic complications that may influence their quality of life (Drappatz, Schiff, Kesari, Norden, & Wen, 2007; Lovely, 1998). Any intracranial tumor, regardless of the degree of malignancy, can potentially invade or displace critical brain areas, resulting in neurologic compromise or even death.

Historically, the true incidence of primary brain tumors may have been under-reported, primarily as a consequence of tumor registries not including low-grade tumors in incidence data. Primary brain tumors also are thought to be increasing in frequency, primarily in older adults (Fisher, Schwartzbaum, Wrensch, & Wiemels, 2007). Although an absolute increase in the incidence is possible, alternative reasons for the increase include improved neuroimaging techniques (increasing the rate of discovery), better patient access to specialized care leading to more accurate diagnoses, changing attitudes toward the care of older adults, both increasing longevity and encouraging medical intervention, as well as a true increase in incidence secondary to exposure to environmental carcinogens (Wen & Kesari, 2008).

The exact etiology of primary brain tumors is not known. Less than 5% of all primary tumors are associated with specific genetic disorders, such as neurofibromatosis, tuberous sclerosis, Turcot syndrome, and von-Hippel Lindau disease (Fisher et al., 2007). Exposure to ionizing radiation is the only definitive risk factor for the development of primary brain tumors (Bondy et al., 2008; Ron et al., 1988; Sadetzki, Modan, Chetrit, & Freedman, 2000). Recently, an inverse association between self-reported allergic conditions and the occurrence of gliomas has been reported (Bondy et al.; Scheurer et al., 2008). In addition, acquired immunosuppression, from either the use of immunosuppressive agents or HIV infection, is associated with an increased incidence of primary central nervous system lymphoma (Schabet, 1999; Schiff, Suman, Yang, Rocca, & O'Neill, 1998). There is reported increased incidence in relation to certain occupations, including manufacturing of synthetic rubber, petrochemical, aeronautics, drug manufacturing, nuclear energy, and precision metal work (Bondy et al.). However, the causative exposure in these occupations has not been fully defined. Recent investigations have focused on the association between exposure to extremely low-frequency electromagnetic fields, including exposure from cellular phones and the development of a primary brain tumor. Despite several large scale epidemiology studies, to date, no definitive association