Neurologic Complications of Cancer and Cancer Therapy

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Neurologic complications that occur as a result of systemic cancer and its treatment can be more disabling for patients than their primary cancer and significantly impair functioning in varied domains. However, recognizing neurologic signs and symptoms as complications of cancer and its treatment can pose a challenge for healthcare providers. Oncology nurses must develop a high index of suspicion for neurologic complications when examining or interviewing patients who present with neurologic symptoms or deficits and have a known systemic cancer. The purpose of this article is to help oncology nurses identify the common presentations of those complications and understand the pathways by which they occur, with the hope that early identification will facilitate appropriate medical intervention and slow the progression of neurologic deficits and systemic decline.

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Neurologic complications can be categorized as direct or indirect, based on their underlying cause (DeAngelis & Posner, 2009). Direct complications refer to those caused by metastases or spread from the site of the primary cancer to the central nervous system (CNS) or the peripheral nervous system. In the CNS, metastasis may involve the brain or spine parenchyma or the subarachnoid space. In the peripheral nervous system, spread usually moves by infiltration of nerve roots, plexi, or muscle from neighboring malignancies. Indirect complications refer to those resulting from treatment (chemotherapy or radiation), from abnormal immune responses to cancer (e.g., paraneoplastic syndromes), or as a result of coagulation disorders causing cerebrovascular complications. The suppressive effect of cancer and its treatment on the immune system also can result in infectious complications within the nervous system, and chemotherapies may cause toxic metabolic conditions (e.g., coagulopathy, paraneoplastic syndrome, encephalopathy) that result in neurologic complications.