CONFERENCE ABSTRACT

Neurological Complications in Cancer and Immunocompromised Patients

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Introduction: Cancer is a leading cause of disability and death throughout the world. In the United States, 1 in 4 deaths are due to cancer, making it the second leading cause of death. A large percentage of the cancer population developed a neurologic complication of their disease. Up to 25% of cancer patients develop a central nervous system (CNS) metastasis over the course of their illness. Because patients are living longer after their cancer diagnosis, the number of neurologic complications has increased, and more patients are suffering from the late effects of treatment and the disease itself.

Discussion:

Direct Effects of Cancer on the Nervous System:

Brain and all CNS metastases typically occur late in the cancer course. In autopsy studies, it has been shown consistently that about 30% of individuals with breast cancer have CNS metastases. The rate is even higher for lung cancer and melanoma at 34 and 72%, respectively. Approximately 25% of all patients with cancer have CNS metastases at death, and in approximately 40% of these patients, the brain is the sole metastatic site.

Indirect Effects of Cancer on the Nervous System:

While neurologic complications of cancer can develop, a consequence of direct metastases to the nervous system, cancer also affects the nervous system indirectly. Cancer induces an inflammatory state, and certain tumors secrete procoagulant substances. For these reasons, patients with cancer, particularly adenocarcinomas, are at a higher risk for ischemic stroke, accounting for the 14.6% incidence of cerebrovascular disease found in an autopsy study. In addition, population studies also show a higher risk of intracerebral haemorrhage. Primary and secondary brain tumors may haemorrhage; particularly high-risk tumors are oligodendrogliomas and brain metastases from choriocarcinoma, melanoma, or renal cell carcinoma. Alternatively, cancer can lead to spontaneous intraparenchymal hemorrhage by causing coagulopathy, as in acute promyelocytic leukemia (APL), patients usually have disseminated intravascular coagulation (DIC) at presentation.

Complications of Cancer Treatment:

Another category of neurologic dysfunction is the short- and long-term effects of cancer therapies, such as radiotherapy, chemotherapy, and the many procedures that are prescribed. Patients receiving treatment are susceptible to a wide variety of pathogens and often develop more severe disease than is seen in the general population from the same infectious agent. Activating the immune system can also have significant neurologic toxicity, as well as treatment-related neurotoxicity can also occur following radiotherapy and surgery. These treatments place patients at risk for stroke, radiation necrosis and other forms of direct damage to nearby structures, such as the brachial plexus.

Conclusion: The nervous system is both a uniquely protected and uniquely vulnerable organ system. Neurologic complications of cancer are common and increasingly prevalent, as patients are surviving longer; they might experience both the acute and delayed consequences of the disease and its treatment. Compromise of the nervous system by cancer or its therapy is often serious but frequently treatable, particularly if recognized early before serious deficits are fully established, making accurate diagnosis essential.