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COMMENTARY

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Pediatric Oncology: Types and Diagnosis

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Introduction

Pediatric Oncology deals with treatment and diagnosis of cancer in children. It may include children between the age of 15-19 years sometimes. The probability of childhood cancer in children is estimated to be 17,500 per year. The death rate is nearly 96,000 per year. The mortality rate in developed countries is comparatively less than that of countries with low resources. When cranial radiotherapy, high dose cytosine arabinoside or methotrexate is used as treatments for childhood cancer, the survivors are likely to develop learning problems as these treatments are therapies related to central nervous system. As the childhood cancer rates have dropped dramatically since the introduction of effective treatment, much attention has been paid to the impairment of cognitive function. The myelinated axons are damaged due to chemotherapy and radiation therapy. The neurocognitive problems involve learning problems, processing speed, memory, mental flexibility, verbal frequency. Factors that may cause childhood cancer are exposure to X-ray or toxic environmental agents. Leukemia, brain tumors, lymphomas are common childhood cancers. The sub classification of central nervous system tumors are astrocytoma, brain stem glioma, craniopharyngioma, ependymoma, medulloblastoma, atypical teratoid rhabdoid tumor, high-grade glioma and desmoplastic infantile ganglioglioma. Neuroblastoma, Ewing sarcoma, Wilms tumor, Childhood rhabdomyosarcoma, Retinoblastoma, Non-Hodgkin lymphoma, Osteosarcoma, Germ cell tumors, Pleuropulmonary blastoma, Hepatoblastoma and hepatocellular carcinoma has chance of less than 5% to be caused in the children. Childhood rhabdomyosarcoma is a cancer caused due to failure of differentiation into muscle cells by the mesenchymal stromal cells. Craniopharyngioma is a brain tumor formed from embryonic tissue of pituitary gland. Symptoms include obstructive hydrocephalus, Hypersomnia, weight gain, Polydipsia, diabetes insipidus, bitemporal hemianopia, Vomiting, reduction in prolactin production. Absence of antidiuretic hormone causes Diabetes insipidus. This includes symptoms such as excessive thirst and urination. Reduction in growth hormone includes symptoms such as stunted growth and delayed puberty, fatigue. Reduction in cortisol leads to Adrenal insufficiency. Fatigue and Low blood pressure are seen. There is increase in survival rate of children suffering from cancer whereas the survival rate in adolescents is constant. Premature cardiovascular disease is a major complication adult survivor of pediatric cancer. There are also effects caused on kidneys and liver of people who survived from childhood cancer. Liver surgery or radiotherapy may also increase the risk of effects on liver in the survivors. Immunotherapy is used to cure pediatric cancer. Advances in immune based therapies have an effective framework to develop these therapies. Though the survival rate of children has been increased, there might be health effects that appear years later. There are different cardiac disease caused based on therapeutic agents. Doxorubicin, daunorubicin may cause Arrhythmias and myocarditis. Busulfan, cisplatin, cyclophosphamide causes Endomyocardial fibrosis, hypertension, ischemia, myocarditis. Vinca alkaloids usage results in Sinus bradycardia, hypotension and conduction abnormalities. Antimetabolites cause chest pain, hemodynamic abnormalities, myocardial infarction and pericarditis. Bevacizumab, rituximab results in Left venticular dysfunction, angioedema and thromboembolism. Tyrosine kinase inhibitors cause chest pain, hypertension, pericardial effusion and arrhythmias. Asparaginase, arsenic trioxide causes heart failure, peripheral edema, ischemia, hypotension and electrocardiographic changes. Screening the cardiovascular damage, frequent monitoring is required for the pediatric cancer survivors.

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None

Conflict of Interest

The authors declare no conflicts.

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