Late sequelae of cancer therapy in long term survivors of childhood malignancies

A Thesis submitted by

Inas Abdou Mahmoud

M.B.B.Ch.

In partial fulfillment of Master Degree

Under supervision of :

IBTISSAM SAAD ELDIN M.D.

PROFESSOR OF CLINICAL ONCOLOGY

FACULTY OF MEDICINE

CAIRO UNIVERSITY

HISHAM ABD AL AAL M.D.

PROFESSOR OF CLINICAL ONCOLOGY

FACULTY OF MEDICINE

CAIRO UNIVERSITY

WAEL SAMIR MAKAR M.D.

LECTURER OF CLINICAL ONCOLOGY

FACULTY OF MEDICINE

CAIRO UNIVERSITY

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Abstract

analyses of the files showed that male patient were 47 (54 %) of female patient were 40 (46%).age ranging from 3 months to 12 years with mean age 3.73 years diagnosed 10 years ago with cancer and received the treatment either chemotherapy or radiotherapy or surgery.most of the patients suffered to some degree of late effects of the treatment, most of them were mild one while others were life-threatening. the most common complications were neurocognitive and psychosocial complications in addition to pulmonary complications.

Key word

oncology- childhood malignancies-cancer

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List of abbreviations

- **ALL:** acute lymphoblastic lymphoma
- **BMI:** body mass index
- **CHF:** congestive heart failure
- **CM:** cardiomyopathy
- **CRT:** 3D-conformal radiotherapy
- **CS-RT:** craniospinal radiotherapy
- **ESR:** erythrocyte sedimentation rate
- **HSCT:** hematopoietic stem cell transplantation
- **IT:** intrathecal
- **GY:** Gray (unit of radiation)
- **GHD:** Growth hormone defeciency
- **GVHD:** graft versus host disease
- **LDH:** lactate dehydrogenase
- **MTX:** methotrexate
- **PET:** positron emission tomography
- **SDS:** standard deviation score
- **TBI:** total body irradiation
- **TRH:** thyroid releasing hormone
- **VOD/SOS:** veno-occlusive/sinusoidal obstruction syndrome
- **WAGR:** Wilm's tumor,aniridia,genitourinary and mental retardation

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Therapeutic advances for the management of childhood malignancies mean that the majority of affected children can realistically hope for long-term survival. It has been estimated that by the year 2011, 1:250 of the adult population will be a long-term survivor of childhood cancer.[1]

The successful treatment of childhood cancer using combinations of chemotherapy, surgery and radiotherapy may be associated with significant morbidity in later life. A major challenge faced by pediatric oncologists today is to sustain the excellent survival rates while striving to achieve optimal quality of life.[1]

Multidisciplinary treatment has been the hallmark of success in pediatric oncology, with physicians and surgeons working together to improve the outcome and reduce the burden of treatment for those vulnerable patients. The last 40 years have shown us that many of the common childhood cancers are not only chemoresponsive, but also chemocurable. Centralization of treatment and high-quality supportive care have allowed our patients to benefit from intensive chemotherapy and radiotherapy.[1,2]

Therefore,the real challenge is to develop strategies for the long-term follow-up of survivors that addresses their needs, provide us with the opportunity to study and evaluate the long-term effects of treatment and its impact on treatment options for newly diagnosed patients.[2]

Most Common Pediatric Tumors

Leukemia

Leukemia is the most common malignancy of childhood, and acute lymphoblastic leukemia is the most common type of leukemia in children. Acute lymphoblastic leukemia typically develops in children between one and 10 years of age, although it can occur at any age. This leukemia is more common in males and in whites.[(1)]

Diagnosing acute lymphoblastic leukemia can be difficult. Frequently, the diagnosis is delayed because early symptoms are nonspecific and may mimic those of viral infections. Most children who have this disease present with generalized malaise, loss of appetite and a low-grade fever. Additional symptoms that should prompt concern include pallor, petechiae or ecchymoses, bone pain and significant weight loss.[(1)]

The physical examination may reveal no abnormalities, but the presence of significant lymphadenopathy or any hepatosplenomegaly should raise suspicion for leukemia. Compared with adults, children normally have more lymphoid tissue in their tonsils, adenoids and

cervical regions; however, hepatosplenomegaly is always an abnormal finding.[2]

A prudent approach to the child with any suspicious findings is to obtain a complete blood count (CBC) with a white blood cell differential and a reticulocyte count. The presence of blast cells on the peripheral smear is indicative of leukemia. However, many patients with leukemia only have blast cells in their bone marrow. The finding of anemia, especially if accompanied by reticulocytopenia or a high mean corpuscular volume, thrombocytopenia, leukopenia or leukocytosis, should prompt consultation with a pediatric hematologist or oncologist, because the likelihood of leukemia is high.[3]

Central Nervous System Tumors

CNS tumors are the second most common childhood malignancy. CNS tumors are classified as intracranial or spinal. In adults, the majority of intracranial tumors are supratentorial. However, infratentorial lesions account for 60 percent of CNS tumors in children.[4]

Children who have infratentorial lesions usually present with ataxia and other gait disturbances, frequently have hydrocephalus as a result of aqueduct compression and may also have cranial nerve abnormalities

from brainstem compression. **(Fig. 1)** shows a typical posterior fossa mass (ependymoma) in a six-year-old child.

Supratentorial tumors occur at any age: These lesions can present with signs of elevated intracranial pressure (headache and vomiting, or an enlarging head in infants) and focal neurologic deficits. Less common findings include seizures, endocrine abnormalities and personality changes.

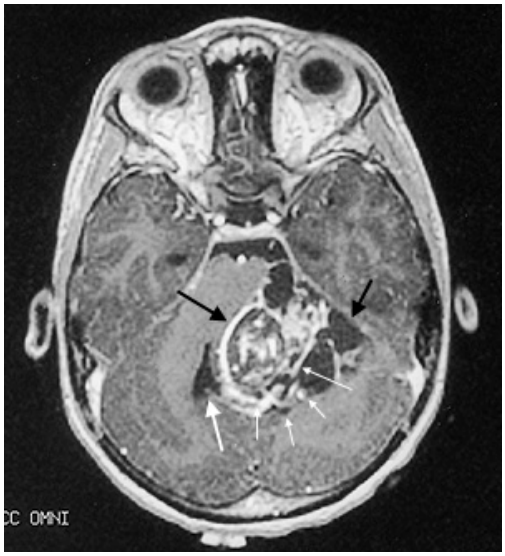

Fig. (1):

Ependymoma: This axial T1-weighted gadolinium-enhanced magnetic resonance image of the brain demonstrates an eccentric cerebellar mass (black arrows) with heterogeneous enhancement. The mass appears centered in the left cerebellar hemisphere and is compressing the fourth ventricle (large white arrow). Focal areas of signal void correspond to calcifications (small white arrows).

Spinal tumors are more common in older children: Malignancies of the spine frequently present as back pain and signs of spinal cord compression, such as weakness and loss of bladder and bowel function.

Headaches are not uncommon in children, and most headaches are not caused by brain tumors, it could be sleep-related headaches ,the absence of a family history of migraine are the strongest predictors that a headache is caused by a space-occupying lesion. Other predictors include vomiting, confusion, neurologic signs, absence of visual symptoms and a duration of less than six months.[5] Diagnostic imaging of the brain is recommended if headaches are awakening a child from sleep, are associated with neurologic signs (including seizures) or occur with vomiting in the absence of a family history of migraine.

Back pain is also a common complaint in children,the sudden onset of back pain of short duration most likely represents a muscle injury. However, examination of the spine, preferably with magnetic resonance imaging (MRI), is critical when a child has back pain that is persistent or worsens when the child is supine, or when back pain is accompanied by signs of spinal cord compression or peripheral neuropathy. Standard radiographs of the spine can easily miss a spinal tumor.[5]