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Oncophysiotherapy Assessments of Musculoskeletal Disorders in Childhood: A Case Report

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Abstract

Background: Musculoskeletal influence in childhood cancers is a matter that is ignored. The aim in our study is to present the results of musculoskeletal evaluation in our case with childhood cancer.

Case: Assessment of the musculoskeletal system of childhood cancer, directed to physiotherapy and rehabilitation, was performed by a oncophysiotherapist. An 11-year-old male patient was included. Acute Lymphoblastic Leukemia (ALL) was diagnosed at the age of 6 years. While no asymmetry and limitations were observed in anthropometric and goniometric measurements, weakness in muscle testing and musculoskeletal disorders in posture analysis were observed.

Discussion: Physical functioning and participation in assessing functional health status and health-related quality of life in childhood cancers should be assessed. The treatment will be optimal considering the level of musculoskeletal influence. There is a need for further work by physiotherapists to evaluate the children in a comprehensive manner in the clinic and research related to functional health status and for the necessary oncophysiotherapy program.

Keywords: Childhood cancer; Musculoskeletal Disorders; Oncophysiotherapy and Rehabilitation

Introduction

Acute Lymphoblastic Leukemia (ALL) is the most common hematological malignancy in children. Children with ALL have good prognosis with overall survival rate of 80% [1]. With high survival rates, musculoskeletal manifestations and risk factors are also increasing [2].

In cancer patients, in the influence of musculoskeletal system; long-bones, vertebral, or any other growing bone at risk of radiation, amputation, or limb salvage; muscle or bone asymmetry or hypoplasia, length difference in legs (shortness or difference in length between two legs), pain, functional deficiencies, abnormalities in gait pattern, common muscle pain, tremor, scoliosis surgery, weakness in arms and legs , fibrosis in kyphosis, bone and soft tissues, and atrophy in muscles [3].

Clinical practice of general physiotherapy rehabilitation is not common in childhood cancers, so it is not evaluated unless patients complaints of some musculoskeletal disorders. Here, we report a 11 year child, who was during oncotherapy completed. The aim in our work is to identify the musculoskeletal disorders in children with cancer and to present it to the related literature.

Case Report

A 11 year child, diagnosed at 2012 and completed the treatment at 2015. The chemotherapy treatment protocol was applied as conventional chemotherapy according to the COG (Children's Oncology Group) standard risk ALL protocol. This protocol consists of 1 month induction therapy, 64 days

consolidation therapy, 56 days intermittent therapy, 56 days late intensification therapy and initiation treatment. The patient was found to have remission in the bone marrow aspiration after taking induction therapy. It has been directed to rehabilitation after admission treatment.

General physiotherapy evaluation of the childhood cancers that was directed to the physiotherapy and rehabilitation department was carried out from the child oncology department. A case assent along with parental consent was obtained. The assessment consists of demographic information, postural analysis, anthropometric and goniometric measurements, and manual muscle testing.

The patient was questioned with a demographic form containing personal and base clinical information. Anterior-lateral-posterior posture assessments were used for the postural analysis [4]. Measurements of length, circumference and fat tissue thickness were made from anthropometric concept [5]. Range of motion were measured with a Baseline® 360° goniometer in degrees [6]. In muscle strength used 0-5 (0=weak, 5=strength, lower scores indicate weakness) muscle test determined by Manual Research Council [7]. For both muscle groups, children were in a sitting, lying, and stand position with the spine, hips and contralateral thigh stabilized. Our patient, who had received chemotherapy treatment, was just continuing his medical controls.

In our postural analysis, we found hallux valgus on the feet and kyphosis on the columna vertebralis. His shoulders had a height difference between the two shoulders with protracted and rounded shoulders.

While no asymmetry and limitations were found in the results of the anthropometric and goniometric measurements, the results of the muscle tests showed that the back extensions in the results were 4/5, the hip attachments 3/5, the hip internal and external rotators 4/5, the foot inverters 3/5, m. Serratus anterior 4/5, trapeze lower part 3/5, deltoid middle and back part 4/5, shoulder internal and external rotators 4/5. Other sceletal muscles were normal (5/5).

For the posture problems seen in our case; a toe collection exercise for the toes and an 8-way bandage treatment for the shoulders. Isolated muscular strengthening exercises were taught for those muscles to relieve the weaknesses. Each exercise was repeated 10-15 times, and 3 times in a day as a home based assignment to do.

In order to our patient to have a more healthy life, it has been suggested to participate in aerobic exercise such as swimming.

The next appointment was planned, reporting that it should be followed up with 3-month checks for repeating the assessments. Advanced research asssessments should take place such as Neurocom system tests, instrumental gait analysis, and EMG diagnosing, etc. The home workout program will be sent back with video recordings and whats app programs via virtual controlled.

Discussion

The results of our analysis; physiotherapy assessments are showed that these children need the rehabilitation support and follow-up prospectively. And the most important point is oncophysiotherapy directed in children with ALL survivors.

Musculoskeletal effects in cancer patients; spinal disorders, upper extremity disorders, lower extremity disorders, radiation fibrosis syndrome, graft-versus-host disease, osteoporosis, bone metastases [8]. However, the symptoms seen in adult patients and the symptoms seen in childhood cancer are different from each other.

Musculoskeletal manifestations are seen in 20-40% patients with ALL. Osteoporosis and reduced bone mineral density had been described in ALL during diagnosis and treatment and even after completion of chemotherapy [9].

Ness et al. reported that the impairments of passive ankle range of motion, proximal muscle strength, motor performance and overall fitness appear to be present at diagnosis in children with ALL. Joint stifness, muscular weakness and associated fatigue may be due to either the disease process or link to the initial administration of glucocorticoids in this patient population [10].

This case report has notable strengths including several types of multipurposed assessments to evaluate young survivors of childhood ALL during their remission term. Importantly, the use of a large to spread it over a wide range.

As a result oncophysiotherapy is an important component of the oncologic medical treatment process and the preventive (retarding) and protective approaches for treatment can only be due to a multi-objective evaluation. Functional capacity and musculoskeletal competence may develop as healthy peers of the child with ALL. Moreover, we will not draw attention to this issue and will shed light on further work.

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