



The Function of Physical Therapy Prior to and Following Hematopoietic Stem Cell Transplantation

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Abstract

Patients who have had hematopoietic stem cell transplantation (HSCT) may experience a variety of musculoskeletal issues that may lead to long-term functional disability. Physical therapy (PT), as a member of the medical staff, has traditionally been promoted for restoring functional capacity and enhancing quality of life following HSCT. This patient group needs a special approach to rehabilitation because of the nature of their condition and the weight of post-transplant sequelae. This strategy must take into account their complex musculoskeletal presentation, which includes fascia, muscle, tendons, bones, and ligaments. Although anecdotal data suggests that these individuals do not always receive the PT care they require, to our knowledge there is no universally accepted structured PT procedure or pathway to enable rehab specialists achieve the best possible results for this patient population. Consequently, the Physical Therapy Association for Graft Versus Host Disease herein provides a brief review on the role of PT in mitigating musculoskeletal complications in collaboration with the Transplant Complications Working Party of the European Society for Blood and Marrow Transplantation, the Survivorship Special Interest Group of the American Society of Blood and Marrow Transplantation, and the Quality of Life Committee of the Eastern Mediterranean Blood and Marrow Transplantation.

Keywords: Exercise; HSCT; Allogeneic; Physical therapy; Marrow Transplantation

Introduction

The rise in the quantity and survival of hematopoietic stem cell transplant (HSCT) patients, quality of life (QoL) after HSCT is a topic of growing significance. Despite improvements in peritransplant care, a number of factors, such as poor physical function, pre- and post-HSCT depression and distress, pretransplant oncologic treatments, the emergence of acute and/or chronic graft-versus-host disease (GVHD) [1], a lack of psychosocial support, medication side effects, pretransplant disease, and inadequate nutrition, can impair quality of life after HSCT. Any form of complete treatment programme that includes physical, psychological, or social components is referred to as rehabilitation. Physical therapy's (PT) function in HSCT survival rehabilitation is extremely varied [2]. But not clearly defined, thus healthcare professionals and patients might not be aware of the advantages PT can provide to patients before and after HSCT. Another obstacle to care may be a shortage of knowledgeable rehabilitation specialists experienced with this unique patient population at a particular institution [3].

This white paper examines the advantages of physical therapy for HSCT patients and offers suggestions for adding PT into routine HSCT survivorship treatment. The Physical Therapy Association for Graft Versus Host Disease is a group of professionals that includes physical therapists, occupational therapists (OTs), and transplant clinicians [4]. They collaborate to coordinate the efforts of physical therapists and OTs required for all physical domains of HSCT patients' physical functioning. Here, the Physical Therapy Association for Graft Versus Host Disease offers a brief overview of the role of PT in reducing musculoskeletal (MSK) complications in cooperation with the Transplant Complications Working Party of the European Society for Blood and Marrow Transplantation, the Survivorship Special Interest Group of the American Society of Blood and Marrow Transplantation, and the Quality of Life Committee of the Eastern Mediterranean Blood and Marrow Transplantation [5].

Consultation Pretransplant

Since at least 1986, research on the evaluation of physical rehabilitation following HSCT have revealed that patients who participate in worthwhile exercise regimens need less physical assistance with everyday activities and depend less on their caretakers during the day. However, medical practitioners are becoming more conscious of the fact that patients HSCT can present with a variety of severe medical issues that directly affect their ability to function [6]. Therefore, including physical therapy prior to transplant should be a crucial component of the pretransplant assessment process. During this process, the patient receives a full physical examination that includes objective measurements of strength and endurance that can serve as a baseline score for tracking improvement or deterioration. The traditional role of PT in identifying and addressing disability may not be sufficient for an optimal physical and occupational health assessment because HSCT survivors are a special population due to the effects of chemotherapy and/or GVHD on MSK systems; therefore, an enhanced role of rehabilitation specialists working in collaboration with clinicians is necessary to prevent disability and to ensure [7].

Steroid Myopathy

In patients with acute or chronic GVHD, for which corticosteroid medication is frequently the first line of immunosuppression, steroid myopathy is a rather common consequence. Prednisone has a dosage-

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related impact; proximal bilateral lower limb weakness can occur with as little as a daily dose of 10 mg of prednisone. When climbing stairs or getting up from a low seat (like a toilet seat), type 2 muscle fibres, which are employed for short bursts of strength, are often impacted. Patients are consequently at danger for falls and subsequently losing their independence [8]. It has been noted that there is a direct relationship between the dosage of corticosteroids and the loss of muscular strength, particularly in the respiratory, hand grip, and knee extensor muscles. a distinctive Steroid-induced myopathy has been shown to benefit from an individualized exercise prescription based on the patient's initial medical, physical, and functional evaluation, and rehabilitation interventions can give patients adaptive methods and equipment to get around obstacles as they are regaining muscle strength [9].

Work life is not only a significant aspect of QoL for many patients, but for many people, getting back to work is a sign of full recovery. Following diagnosis, cancer patients may undergo a two- to six-year decline in their physical capacity for work. Physical therapists with occupational health training are most equipped to conduct pre-employment physical and functional testing, which will enable both employees and employers to make educated decisions about a candidate's suitability for a position [10]. With the patient's consent, the physical therapist may speak with employers and offer advice on the kind of employment one can do, including a gradual return to work. A phased return to work may involve workplace modifications, altered or shortened workdays, altered job duties, or a progressive increase of work, altered work environments, and routine interaction with or between bosses, coworkers, and healthcare professionals [11].

Cancer patients need continual assistance from medical and rehabilitation teams since disability can be episodic. As part of a multidisciplinary team that develops a return to work-specific rehabilitation programme and tracks progress toward that goal, we advise that occupational health specialist and physical therapist experienced in return to work functional capacity evaluation assess patients both in the inpatient and outpatient setting whenever possible. Functional evaluation for returning to work has numerous facets.

Discussion

With the patient's consent, the physical therapist may speak with employers and offer advice on the kind of employment one can do, including a gradual return to work. An incremental increase in workload, changed job assignments, modified environments, and regular communication with or between managers, coworkers, and health professionals can all be included in a phased return to work. Cancer patients need continual assistance from medical and rehabilitation teams since disability can be episodic. We advise that whenever possible, a multidisciplinary team that develops a rehabilitation plan specifically for returning to work should include occupational health specialist and physical therapist with experience in functional capacity evaluation for return to work and tracks advancement toward that objective. The process of conducting a return to work functional assessment comprises many different components, which are depicted in along with its key characteristics. Finally, issues other than compromised physical function may have an impact on some patients' return to work plans. According to certain studies, more than 50% of HSCT patients experience cognitive issues that affect their memory, concentration, decision-making, visual memory, and motor

function. In order to provide patients who are willing to return to work with the necessary support, any assessment of return to work should take into account the cognitive component of the issue in this patient group. Exercises can help with cognitive function because certain research has shown a positive effect of structured exercises on it.

Conclusion

Exercises can therefore be used in conjunction with other therapy to treat cognitive issues. Physical therapists and/or occupational therapists should review the functional assessment of structured exercises for cognitive function, develop a connection with employers and clinicians, and assess the goals of functional recovery appropriate for the workplace. Although it is challenging to give specific suggestions due to the lack of data in the field of physical therapy, basic advice is provided to assist doctors and physical therapists providing treatment for HSCT patients in maximizing collaborative care. Lack of data emphasises how urgently needed clinical studies are in this field. Additionally, in the current era of transcriptomic, metabolomics, and proteomics, translational research is required to identify the biological basis of physical therapy and/or occupational therapy therapies as well as the basis of MSK pathology in HSCT patients.

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