Journal of Leukemia
ISSN: 2329-6917

Abo and Granger, J Leuk 2017, 5:3
DOI: 10.4172/2329-6917.1000236

Letter to Editor Open Access

Changing the Way We Approach Rehabilitation in Bone Marrow Transplantation

Shaza Abo[1,2*] **and Catherine L Granger**[1,2]

[1]*Department of Physiotherapy, Royal Melbourne Hospital, Australia*

[2]*Department of Physiotherapy, The University of Melbourne, Australia*

***Corresponding author :** Shaza Abo, The Royal Melbourne Hospital - City Campus Level 4 North - Allied HealthGrattan Street, Parkville Victoria 3052, Australia, Tel: +613 9342 7440; E-mail: shazasandra.abo@mh.org.au

Received date: May 26, 2017; **Accepted date:** June 19, 2017; **Published date:** 23 June, 2017

Letter to Editor

Allogeneic bone marrow transplantation (alloBMT) is a highly intensive form of treatment for people with haematological cancer. Given its intensity and potential short and long term complications, there are significant risks of physical and psychological morbidity following treatment [1]. Several studies have identified that the side effects of an alloBMT can be long term and include physical impairments such as muscle weakness and reduced endurance; persistent symptoms such as fatigue; and poor health-related quality of life (HRQoL) [2,3]. Whilst the side effects observed in allogeneic and autologous BMT are similar, those experienced following an alloBMT are more numerous and severe due to prolonged hospital length of stay and greater risk of debilitating long-term complications such as graft-versus-host-disease [1,4]. The survival rate for patients treated with alloBMT is increasing [5] and therefore as this chronic disease population increases in size, there is awareness of the need to focus on prevention of long-term morbidity and addressing patient survivorship needs.

Exercise is a non-pharmacological treatment with potential benefit for people with cancer [6] and there is growing interest in the potential efficacy of exercise training to improve patient outcomes for those undergoing BMT. In other cancer populations, such as breast and prostate cancer, there is a large body of strong evidence supporting the efficacy of exercise training [6]. Specifically in alloBMT, there is a relatively small number of studies to date [7], although these also suggest that structured exercise training is safe and may be associated with improvements in fatigue and HRQoL [7]. The majority of studies have focused on structured exercise training, including a combination of aerobic and resistance training, following completion of BMT [7]. We believe there is a need to extend the scope of exercise delivery to focus on 1) a broader perspective of physical activity behaviour and 2) widen the delivery of exercise intervention to commence as early as possible pre-BMT and continue both during and after hospitalisation.

There are a number of rationales for our call to expand the scope of exercise in this patient population. Firstly, patients present to BMT with reduced muscle strength, exercise capacity and HRQoL when compared to the healthy population [3]. The ability therefore to maximise their health status before the insult of treatment is preferred. Evidence is beginning to emerge with trends supporting the use of "prehabilitation" in other cancers such as lung [8] and colorectal cancer demonstrating that training patients before surgery appears to translate in improved post-treatment outcomes [9]. There has been very little work specifically investigating the role of isolated exercise training in the pre-alloBMT phase to determine the impact of prehabilitation in alloBMT. However, a trial by Wiskemann and colleagues in 2011, investigated the use of exercise prior to, during and after transplantation in 105 patients undergoing alloBMT. The exercise group had significant improvements in fatigue, exercise capacity and psychological distress compared to usual care control [10]. Interestingly, in this study there was a trend between improved survival in those with higher baseline fitness levels before transplant [11]. The recent study by Wingard and colleagues however did not find an association between pre-BMT exercise levels and survival in a cohort of 310 patients treated with alloBMT [12]. There is a need to continue this research, and include long-term outcomes such as survival.

We cannot ignore the fact that most people being worked up for alloBMT do not meet the minimum levels of physical activity for health [13]. In addition to structured exercise training in the pre-BMT phase, a focus is required on changing physical activity behaviour for patients. We know from rehabilitation in other patient settings, such as pulmonary rehabilitation for chronic lung disease, that exercise training alone rarely translates to increased physical activity levels and a change in behaviour and therefore we cannot assume that exercise training alone will be sufficient for our patient group [14]. Interventions should aim to improve physical activity behaviours prior to treatment, so that patients are self-empowered to improve their own health and reduce the risk of negative secondary effects following alloBMT. Based on available evidence to date, it appears these patients benefit more from demonstrated or supervised exercise rather than self-directed programs [15]. Perhaps the best way to achieve behavioural change is to apply novel exercise approaches such as technology (activity devices, smart phone apps, telehealth) focused around education, training and enablement from the behavioural change wheel framework to implement exercise as part of routine life in people being prepared for and treated with alloBMT [16]. We wait with anticipation as the next generation of evidence around the optimal use of exercise training and behaviour change is generated to best maximise our patients' outcomes.

References

1. Jenq R, Van den Brink M (2010) Allogeneic haematopoietic stem cell transplantation: individualized stem cell and immune therapy of cancer. Nat Rev Cancer. 10: 213-221.
2. Tabbara IA, Zimmerman K, Morgan C, Nahleh Z (2002) Allogeneic hematopoietic stem cell transplantation: complications and results. Arch Intern Med 162: 1558-1566.
3. Morishita S, Kaida K, Ikegame K (2012) Impaired physiological function and health-related QOL in patients before hematopoietic stem-cell transplantation. Support Care Cancer. 20: 821.
4. Copelan E (2006) Hematopoietic Stem-Cell Transplantation. N Engl J Med. 354: 1813-1826.
5. Nivison-Smith I, Bardy P, Dodds AJ (2013) A Review of Hematopoietic Cell Transplantation in Australia and New Zealand, 2005 to 2013. Biol Blood Marrow Transplant. 22: 284-291.

6. Dennett A, Peiris C, Shields N, Prendergast L, Taylor N, et al. (2016) Moderate-intensity exercise reduces fatigue and improves mobility in cancer survivors: a systematic review and meta-regression. J Physiother. 62: 68-82.
7. Van Haren I, Timmerman H, Potting C, Blijlevens N, Bart Staa, et al. (2013) Physical Exercise for Patients Undergoing Hematopoietic Stem Cell Transplantation: Systematic Review and Meta-Analyses of Randomized Controlled Trials. Phys Ther. 93: 514-528.
8. Granger C (2016) Physiotherapy management of lung cancer. J Physiother. 62: 60-67.
9. Silver J, Baima J (2013) Cancer prehabilitation: an opportunity to decrease treatment-related morbidity, increase cancer treatment options, and improve physical and psychological health outcomes. Am J Phys Med Rehabil .92: 715-727.
10. Wiskemann J, Dreger P, Schwerdtfeger R (2011) Effects of a partly self-administered exercise program before, during, and after allogeneic stem cell transplantation. Blood. 117: 2604-2613.
11. Wiskemann J, Kleindienst N, Kuehl R, Dreger P, Schwerdtfeger R, et al. (2015) Effects of physical exercise on survival after allogeneic stem cell transplantation. Int J Cancer. 137: 2749.
12. Wingard J, Martens M, Le-Rademacher J (2017) Pretransplantation Exercise and Hematopoietic Cell Transplantation Survival: A Secondary Analysis of Blood and Marrow Transplant Clinical Trials Network (BMT CTN 0902). Biol Blood Marrow Transplant. 23: 161-164.
13. Schmitz K, Courneya K, Matthews C (2010) American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. Med Sci Sports Exerc. 42: 1409-1426.
14. Troosters T, van der Molen T, Polkey M (2013) Improving physical activity in COPD: towards a new paradigm. Respir Res.14: 115.
15. Jacobsen P, Le-Rademacher J, Jim H (2014) Exercise and stress management training prior to hematopoietic cell transplantation: Blood and Marrow Transplant Clinical Trials Network (BMT CTN) 0902. Biol Blood Marrow Transplant. 20: 1530-1536.
16. Michie S, Van Stralen M, West R (2011) The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implement Sci. 6: 42.