OPEN ACCESS Freely available online

Journal of Cell Science & Therapy

Commentary

Anthracycline Induced Cardiomyopathy and Allogeneic Mesenchymal Cell Therapy for Heart Failure

Davis Lewis*

Department of Science, University of Texas Health Science, Texas, USA

DESCRIPTION

Anthracycline Induced Cardiomyopathy (AIC) is a well-known complication of anthracycline chemotherapy, leading to the development of heart failure. Current treatment options for AIC are limited, and novel therapeutic approaches are urgently needed. Allogeneic mesenchymal cell therapy has emerged as a potential regenerative strategy for cardiac repair. This short communication provides a description of the use of allogeneic mesenchymal cell therapy in AIC heart failure patients, highlighting its therapeutic potential, mechanisms of action, and current challenges. The discussion includes the evidence from preclinical and clinical studies, emphasizing the need for further research to optimize cell-based therapies for AIC patients. Anthracyclines, such as doxorubicin, are widely used chemotherapeutic agents; however, their clinical utility is limited by their potential cardio toxic effects. Anthracycline Induced Cardiomyopathy (AIC) is characterized by the progressive deterioration of cardiac function and the development of heart failure. Traditional heart failure treatments often provide inadequate improvement in AIC patients, necessitating the exploration of novel therapeutic options. Allogeneic mesenchymal cell therapy has emerged as a promising approach for cardiac repair in AIC patients. Allogeneic mesenchymal cells, including Mesenchymal Stem Cells (MSCs) and cardiac progenitor cells, have shown regenerative properties and immunomodulatory effects. These cells can be derived from various sources, such as bone marrow, adipose tissue, or umbilical cord tissue. Allogeneic cell therapy involves the transplantation of cells from a healthy donor to the recipient, eliminating the need for autologous cell collection and expansion. The therapeutic effects of allogeneic mesenchymal cell therapy in AIC heart failure patients are attributed to multiple mechanisms. Firstly, these cells can differentiate into cardiomyocytes, endothelial cells, and smooth muscle cells, contributing to the regeneration of damaged cardiac tissue. Secondly, they release paracrine factors, such as growth factors, cytokines, and extracellular vesicles, which promote angiogenesis, reduce inflammation, and enhance endogenous repair processes. Additionally, allogeneic cells exert immunomodulatory effects by suppressing excessive immune responses and promoting immune tolerance. Preclinical studies using animal models of AIC have demonstrated the beneficial effects of allogeneic mesenchymal cell therapy. These studies have shown improvements in cardiac function, reduction in myocardial fibrosis, and attenuation of oxidative stress and inflammation. Moreover, allogeneic cell transplantation has been shown to enhance angiogenesis and neovascularization, promoting the recovery of damaged myocardium. Limited clinical trials have explored the use of allogeneic mesenchymal cell therapy in AIC heart failure patients. Preliminary results have demonstrated the safety and feasibility of allogeneic cell transplantation, with some studies reporting improvements in left ventricular ejection fraction, exercise capacity, and quality of life. However, challenges such as optimal cell dosage, timing of administration, and long-term efficacy need to be addressed in future clinical investigations. Several challenges exist in the translation of allogeneic mesenchymal cell therapy into clinical practice for AIC heart failure patients. These include standardization of cell manufacturing processes, optimization of cell delivery methods, and determination of the optimal patient selection criteria. Long-term follow-up studies are necessary to assess the durability and sustainability of the therapeutic effects. Additionally, the potential risks of allogeneic cell therapy, such as immune rejection and tumorigenicity, should be thoroughly evaluated.

CONCLUSION

Allogeneic mesenchymal cell therapy holds great promise as a regenerative approach for the treatment of AIC-induced heart failure. Preclinical and initial clinical studies have shown encouraging results, demonstrating improvements in cardiac function and quality of life. However, further research is required

Correspondence to: Davis Lewis, Department of Science, University of Texas Health Science, Texas, USA, E-mail: barrydavis@uth.tmc.edu

Received: 01-May-2023; Manuscript No. JCEST-23-24714; **Editor assigned:** 03-May-2023; Pre-Qc No JCEST-23-24714 (PQ); **Reviewed:** 17-May-2023; Qc No. JCEST-23-24714; **Revised:** 26-May-2023, Manuscript No. JCEST-23-24714 (R); **Published:** 02-Jun-2023, DOI: 10.35248/2157-7013.23.14.399

Citation: Lewis D (2023) Anthracycline Induced Cardiomyopathy and Allogeneic Mesenchymal Cell Therapy for Heart Failure.14:399.

to optimize cell-based therapies, address safety concerns, and establish the long-term efficacy of allogeneic mesenchymal cell therapy in AIC patients. With continued advancements in this field, using allogeneic mesenchymal cell therapy could greatly change how we treat AIC and give diagnosed patients aspiration for better outcomes.