

International Conference on
CELL AND STEM CELL RESEARCH
&
International Conference on
MEDICAL AND SURGICAL NURSING

August 17-18, 2018

Singapore City, Singapore

A study on role of stem cell (autologous bone marrow derived mononuclear progenitor cell) therapy in healing of diabetic foot ulcer

Aparna Kanungo
SOA University, India

Introduction: Diabetes Mellitus (DM) is a chronic metabolic disorder characterized by the presence of chronic hyperglycemia accompanied by greater or lesser impairment in the metabolism of carbohydrates, lipids and proteins. Diabetic neuropathy is the most common and dreaded complication of diabetes mellitus (DM), affecting as many as 50% of patients with DM. Poor wound healing in diabetic patients ultimately progress to incurable ulceration, gangrene, and even limb loss without any trauma. In recent years, Stem Cell therapy has emerged as a promising modality in the management of diabetic foot ulcers. It stands at the core of a new field called as Regenerative Medicine.

Aims & Objectives: This study aims to determine if stem cell applications with one's own cell (Autologous cells) delivered to the ulcer and/or gangrene due to poor blood flow, will be safe and it shall relieve lower limb pain, increase blood flow and /or cure the foot ulcer and to analyse the role of bone marrow derived mononuclear progenitor cells in neo-angiogenesis, improvement of functional activity of the ischemic leg, reduce infection and improve healing as a whole.

Materials & Methods: A total number of 50 cases of diabetic foot ulcers were randomly included in the study which was further divided into a control and a study group, containing 25 patients in each group. The patients in control group were treated with only surgical debridement followed by normal saline dressing while the patients under study group were treated by surgical debridement followed by autologous bone marrow therapy(after isolation & extraction) to the ulcer site.

Results: The patients were followed post therapy in terms

of decrease in wound size (cm²) after 2 weeks, 4 weeks, 6 weeks and 8 weeks duration. Wound healed after single treatment with mononuclear cell concentrate (MNCs) in 5 patients within 4 weeks duration. 7 patients were in need of multiple treatments with MNCs for complete closure of the wound at the end of 8 weeks. 5 patients required skin grafting for their wound healing. 3 patients required more period of follow up for their wound closure. 5 patients did not respond well with MNC treatment (either in terms of pain/ wound size control) and resorted to other forms of treatment. While in control group healing rate was comparatively slower and required more than 6-8 weeks for the establishment of healthy granulation tissue and wound contracture to occur. Two patients underwent below knee amputation because of delayed wound healing.

Discussion: The most consistent risk factor in our study were late presentation to the hospital, delayed referral by the primary treating physician, long duration of diabetes and poor control of diabetes either due to irregular medication or ignorance. The mainstay of treatment for DFU was surgical debridement followed by regular dressing with normal saline. The addition of stem cells acted as an adjuvant therapy and enhanced faster healing of the ulcer bed with better patient compliance.

CONCLUSION: The application of mononuclear stem cells over the ulcers is a safe procedure, without any adverse reaction. The rate of wound closure and overall healing has been marginally improved in stem cell therapy group as opposed to the control group in terms of size and duration. Therefore it is concluded that stem cell therapy holds major therapeutic potential in the healing of chronic diabetic foot ulcers, which is supported by various randomized studies and clinical trials.

Biography

Aparna Kanungo has completed her Post Graduation in –General Surgery from IMS & SUM HOSPITAL, S'O'A UNIVERSITY, Bhubaneswar, Odisha and she is now SENIOR RESIDENT in Burns & Plastic Surgery, All India Institute of Medical Sciences (AIIMS). Bhubaneswar, India.

sonykan@gmail.com