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Our Experience in treating Ischemic Ulcer of a Lower Limb in 4 diabetic patients with Autologous Bone Marrow Stem Cells

Subrammaniyan SR*[1],Rajkumar M[1], AmalopavanathanJ[1], Shankar R[1], Manjunath S[2], Senthil Kumar R[2], Abraham S[2, 3]

[1] Dept. of Vascular Surgery, Vijaya Hospital, Chennai, India
[2] Nichi-In Centre for Regenerative Medicine, Chennai, India,
[3] Yamanashi University, Tamaho, Japan

* Dr.S. R. Subrammaniyan, Consultant Vascular Surgeon, Vijaya Hospital, 18, NSK Salai, Chennai - 600 026., India. E.Mail: drsrsubrammaniyan@rediffmail.com

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Background:

Chronic limb ischemia is an outcome of peripheral arterial occlusive disease. When conventional medical and surgical treatments are not feasible, amputation is the only option left. Recent studies report that the injection of bone marrow mononuclear cells and Peripheral blood mononuclear cells rich in CD34+ cells have resulted in symptomatic recovery, improved functional activity of the ischemic limb as well as healing of the ulcers. Here we report our experience with 4 patients of such case where autologous bone marrow mononuclear cells were injected and the patient followed up for 6 months. Materials and Methods: Four patients with critical limb ischemia with ulcers were referred for amputation of their limb. A 68-year-old female with critical limb ischemia with an ulcer in the left leg measuring 30X12 cm over the posterior portion of the leg and extending to the medial aspect of the foot measuring 14X10 cm, a 65-year-old male with necrotic wound in his lower foot, a 69-year-old male with a deep wound in his lower foot and a 61-year-old male with ulcer in his toe amputated with all the toe fingers. The first two patients were given injections for more than one sitting at appropriate intervals specified by the clinician. Under short general anesthesia, 110 ml of Bone marrow was aspirated each time, transported in Acid Citrate Dextrose and was processed for mononuclear cells (MNC) by Ficoll density gradient centrifugation, following the cGMP protocols. The MNC concentrate was injected at various sites in the Gastrocnemius muscle and the surrounding area after necessary debridement. Skin grafting was performed in the first two patients and followed up for a period of at regular intervals of 6 to 9 months. The patients have been followed up at regular intervals for six months after the treatment with investigations such as Ankle-Brachial Index, Doppler and Angiogram.

Results:

All the patients showed improvements with healthy granulation gradually started appearing in the areas which were previously

unhealthy and ischemic. Slow granulation was found in-patient 3 and but the patient 4 died because of other factor such as renal failure, peritoneal dialysis and cardiac failure. Patients 1 and 2 had healthy granulation, uniform revascularization and after a period of 9 months, healing was completely possible.

Conclusion:

Stem cell therapy is definitely useful where, revascularization is not feasible at the same time, renal failure, cardiac failure, etc do present some difficulties. All the parameters need to be taken care. Growth factors or plastic surgery need not be used for stem cell therapy thus considering only the appropriate time of injections. As Autologous Bone Marrow stem cell therapy helps in neoangiogenesis and wound healing process in case of chronic ischemic wounds it can be applied in cases as reported herewith.