

# CYTOTHERAPY

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## INTRA ARTICULAR INJECTION OF AUTOLOGOUS BONE MARROW-DERIVED MESENCHYMAL STROMAL CELLS IN PATIENTS WITH MODERATE TO SEVERE OSTEOARTHRITIS

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**Background:** Bone marrow-derived mesenchymal stromal cells (BMMSC) can be expanded *ex vivo* which have the ability to regenerate cartilage for accelerated healing of the knee as demonstrated by animal studies and early clinical reports. In this study we have evaluated the safety and feasibility of using autologous BMMSC as an intra-articular injection for the treatment of symptomatic moderate to severe osteoarthritis.

**Methods:** Fifteen patients with symptomatic moderate to severe knee osteoarthritis were recruited. All patients have persistent non-improving or deteriorating pain despite regular oral analgesics and multiple hyaluronic injections. Autologous BMMSC was resuspended in a mixture of hyaluronic acid and autologous platelet rich plasma before intra-articular injection procedure. Patients were assessed and followed-up using the Oxford Knee Score (OKS) and magnetic resonance imaging (MRI) for up to 12 months.

**Results:** The mean OKS at 6 and 12 months after BMMSC injection increased significantly ( $42.6 \pm 6.2$  and  $44.8 \pm 8.1$ ) when compared to baseline scores ( $35.2 \pm 6.5$ ). At 12 months, an improvement of OKS of 4 points or more was observed in 10 patients when compare to their baseline scores for both knees while 2 patients experienced improvement in the right knee only. MRI at 12 months post-BMMSC treatment showed noticeable improvement in 60% of patients including mean increase in cartilage thickness from baseline, resolution of subchondral cysts and reduction of effusion.

**Conclusion:** Autologous BMMSC injection is safe, feasible and may be beneficial for the symptomatic treatment of patients with moderate to severe osteoarthritis who have failed conventional treatment.