

Functional and Radiological Comparison of Umbilical Cord Mesenchymal Stem Cells, Somatotropin, and Hyaluronic Acid Injection for Cartilage Repair in Early Osteoarthritis of the Knee: A Randomized Controlled Trial

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The umbilical cord-mesenchymal stem cells (UC-MSC) has been shown to improve the viability of degenerated chondrocytes in knee osteoarthritis (KOA) in cellular level. Additional somatotropin injection also shown clinical improvement in patients. The present trial is conducted to assess the efficacy of umbilical cord mesenchymal stem cells (UC-MSC) in comparison to somatotropin and hyaluronic acid (HA) injection to treat and slow the progression of knee osteoarthritis.

Methods : This study was conducted from January 2016 to April 2018 in Cipto Mangunkusumo General Hospital. A total of 28 knees from 15 patients with early KOA Kellgren Lawrence I-II were randomized into three groups. Group A was treated with 1x10⁶ units of intra-articular UC-MSCs + 2 ml HA followed with 2 consecutive weeks of HA injection; group B was treated with the same dose of HA with additional 8 IU of Somatotropin; group C was treated as control. The International Knee Documentation Committee (IKDC) score, The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), visual analogue score (VAS), were assessed on the 1st and 3rd month, then every 3rd month until 12 months. Cartilage evaluation using MRI cartigram were performed at pre-implantation, and after the 6th and 12th month after implantation

Results : General improvement were observed in all groups after 6 and 12 months. The IKDC score improved significantly among groups after 12 months (69.43 [48.3-89.66], 79.31 [51.72-90.08], and 75.9 [67.82-97.7] in group A, B, and C, respectively, p =0.005). We did not find a significant difference between groups in VAS and WOMAC results. However, we observed a medial T2 improvement in group A (39.55 [32.65-67.85] initially and 45.64 [38.12-70.65] 12 months after implantation).

Conclusion : Injection of UC-MSC could improve knee function and cartilage profile in early KOA. However, further multicenter studies with larger samples are required to investigate the efficacy of such treatment for treating knee osteoarthritis.

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