

Bone Marrow Aspirate Concentrate Injections for the Treatment of Knee Osteoarthritis: A Systematic Review of Randomized Controlled Trials

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INTRODUCTION: Osteoarthritis (OA) poses a significant global burden, with conventional treatments like corticosteroid and hyaluronic acid injections commonly employed. Emerging injectable biologics including bone marrow aspirate concentrate (BMAC), show promise in OA management. The aim of this review is to investigate the clinical efficacy of BMAC injection compared with other injection treatments for knee OA.

METHODS: A systematic review was conducted using PubMed, Embase, Cochrane Library, and Google Scholar to identify Level I studies that compared the clinical efficacy of BMAC with other injections. The search terms used were ["bone marrow" OR "bone marrow aspirate concentrate" OR "BMAC" OR "bone marrow concentrate") AND ("intra-articular" OR "intraarticular" OR "injection") "knee" AND "osteoarthritis"[mesh]]. For studies comparing BMAC and hyaluronic acid (HA), each clinical score was standardized to pain and function scales based on the minimal clinically important differences (MCID).

RESULTS:

Eight studies, consisting of a total of 937 patients, were included. BMAC showed a significant improvement in clinical scores compared to baseline, starting at 1 month post-injection. For pain scores at 6-month ($P = 0.033$) and 12-month follow-up ($P = 0.011$), BMAC demonstrated favorable results over HA, with a statistically significant difference. These differences did not exceed the MCID. When comparing BMAC with other injections, no significant differences were observed in the degree of clinical score improvement. No serious adverse events or events significantly associated with BMAC compared to other treatments were reported.

DISCUSSION AND CONCLUSION:

BMAC injections demonstrated effectiveness in providing pain relief and functional improvement for patients with knee osteoarthritis. When comparing BMAC to other intra-articular injection options, distinct differences surpassing the MCID were not evident. Further research is deemed necessary to investigate the sustained therapeutic effects of BMAC.

