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Original Article

Effects of intra-articular versus peri-articular dextrose prolotherapy in knee osteoarthritis: A clinical trial study

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ABSTRACT

Objectives: This study aims to compare the effectiveness of intra-articular and peri-articular dextrose prolotherapy (DPT) in patients with knee osteoarthritis (KOA) without effusion.

Patients and methods: Between August 2018 and November 2018, a total of 51 participants including 27 cases (12 males, 15 females; mean age: 55.7±5.2 years; range, 38 to 70 years) in Group A and 24 cases (9 males, 15 females; mean age: 54.7±4.6 years; range, 38 to 70 years) in Group B were recruited. Group A received intra-articular DPT, while Group B received peri-articular DPT. Treatment was administered two times with two-week intervals. The Visual Analog Scale (VAS), Western Ontario and McMaster Universities Arthritis Index (WOMAC) and Oxford Knee Scale (OKS) questionnaires were filled at baseline, and four and eight weeks after first injection.

Results: At four and eight weeks, the VAS, OKS, and WOMAC scores improved from baseline in both groups. There was no significant difference in the WOMAC and OKS scores between two methods. The VAS scores showed superiority of intra-articular method ($p<0.05$).

Conclusion: Both peri-articular and intra-articular DPT were effective in patients with KOA. There was no superiority in terms of functional improvement between two groups. However, intra-articular prolotherapy was more effective in decreasing pain in these patients.

Keywords: Intra-articular injection, knee, osteoarthritis, prolotherapy.

Knee osteoarthritis (KOA) is a destructive and disabling disease which influences up to 6% of population more than 30 years old resulting in pain, joint stiffness and decreased function.[1] It affects most adults with age 65 or more with a prevalence of 33.6% (12.4 million) in the United States by the year 2008.[2] The origins of the pain are clearly unknown. However, it is believed that intra- and peri-articular structures are the sources of the pain.[2-4] There are several treatment options for KOA, ranging from pain killers to injection and surgery.[1,2] Prolotherapy is one of the injection-based therapies for KOA. It involves the injection of irritants like hypertonic dextrose for treatment of chronic musculoskeletal pain through the probable mechanism of proliferation of fibroblasts, collagen synthesis, and tissue healing.[5,6] The definite mechanism of action for dextrose prolotherapy (DPT) is unclear. However, several multimodal mechanisms have been suggested such as initiating a local inflammatory cascade inducing the growth factor and collagen deposition resulting in a connective tissue repair, strengthening of the structures and reducing pain.[7,8] Wilson et al.[9] also showed a multifactorial mechanism for DPT in this way that it dehydrated cells at the site of injection inducing cell rupture by producing an osmotic gradient which initiated an acute inflammatory cascade, followed by tissue healing. Several human studies have revealed the positive effects of DPT for different musculoskeletal disorders such as rotator cuff related shoulder pain

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results from our study. Thus, more injection sessions would be preferable. Furthermore, the follow-up period in our study was relatively short; therefore, further long-term studies are warranted. Moreover, the WOMAC questionnaire including patient's function, pain and stiffness should be analyzed separately to achieve more definite results about the efficacy of our interventions on each part. Finally, we followed patients by subjective assessments using mentioned questionnaires without evaluating the radiological changes after the injections. Lack of a placebo or control group was another limitations. Therefore, further multi-center, large-scale, long-term studies including control groups using objective assessment methods are recommended.

In conclusion, both peri-articular and intra-articular DPT had the same efficacy at least for a short period of time in patients with KOA. There was no superiority in terms of functional improvement between the two groups. However, intra-articular prolotherapy was more effective in decreasing pain in this patient population.

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Ethics Committee Approval: The study protocol was approved by the School of Medicine Shiraz University of Medical Sciences Ethics Committee (date: 22,05,2018, no: IR.SUMS.MED.REC.1397.088). The Iranian Registry of Clinical Trial (IRCT) approved this retrospectively registered study at 2018-07-18 with reference number "IRCT20171111037396N1". The study was conducted in accordance with the principles of the Declaration of Helsinki.

Patient Consent for Publication: A written informed consent was obtained from each patient.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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