

Nonoperative Management of Trapeziometacarpal Joint Osteoarthritis: A Systematic Review Analyzing Pain Outcomes After Minimum Six Months of Follow-up

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INTRODUCTION: Nonoperative treatments for trapeziometacarpal joint osteoarthritis (TMJO), including corticosteroid (CSI) and hyaluronic acid (HA) injections, platelet-rich plasma (PRP), dextrose, hand therapies, and orthoses, provide significant and varying degrees of pain relief over a minimum follow-up period of six months.

METHODS:

This systematic review, adhering to PRISMA guidelines, searched PubMed, Cochrane, Embase, and Medline databases for randomized controlled trials (RCTs) assessing the pain outcomes of nonoperative TMJO treatments. The visual analog scale (VAS) measured pain before and after treatments, with a follow-up of at least six months.

RESULTS:

The analysis of eleven RCTs provided moderate-quality evidence of the following outcomes: 1) After six months, CSI and HA injections resulted in similar mean delta pain scores. However, CSI provided rapid pain relief within 2-3 weeks. At the 12-month mark, CSI continued to reduce pain with a mean delta pain score of 1.0 ($P<0.05$), while HA injections showed a slight, non-significant improvement with a mean delta pain score of 0.5 ($P=0.16$). 2) Relatively novel therapies for TMJO, such as PRP and dextrose, demonstrated greater long-term pain relief than CSI injections, with dextrose achieving a mean delta pain score of 3.8 ($P<0.001$) at six months and PRP reaching 5.5 ($P=0.005$) at twelve months. 3) Hand therapy methods, especially standard hand exercises and extracorporeal shockwave therapy (ESWT), significantly alleviated pain at the six-month follow-up, with hand exercises resulting in a mean delta pain score of 1.5 ($P=0.019$) and ESWT achieving a mean delta pain score of 4.2 ($P<0.001$). 4) Orthotic devices significantly reduced pain over six months, showing a mean delta pain score reduction of 2.6 at 180 days ($P=0.023$) and 2.2 at twelve months ($P=0.002$).

DISCUSSION AND CONCLUSION:

The amount of pain relief was comparable between CSI and HA, with CSI probably providing longer lasting benefit after 12 months. Although there not sufficient evidence, Dextrose and PRP treatments showed superior long-term pain reduction compared to CSI. Hand therapies and orthoses are effective nonoperative treatments for TMJO, offering significant pain relief at six-month follow-up.

TABLE 1. Description of Articles & Study Demographics							
First Author	Year	Journal	Study Design	Level of Evidence	No. of Patients (Study/Control)	Mean Age (SD)	Sex (% Female)
Stahl et al.	2005	J Clin Rheumatol	RCT	I	Steroid: 25 Hyaluronate: 27	Steroid: 62 Hyaluronate: 62	Steroid: 84 Hyaluronate: 92.3
Fuchs et al.	2006	Osteoarthritis Cartilage	RCT	I	Sodium hyaluronate (SH): 28 Triamcinolone acetate (TA): 28	SH: median 59.5 TA: median 61.0	80.4
Heyworth et al.	2008	J Hand Surg Am	RCT	I	Hylan: 20 Steroid: 22 Control: 18	Hylan: 64 Steroid: 65 Control: 64	86.7
Bahadir et al.	2009	Clin Rheumatol	RCT	I	Steroid: 20 Hyaluronate: 20	Steroid: 62.9 (9.1) Hyaluronate: 60.8 (7.3)	Steroid: 100 Hyaluronate: 100
Rannou et al.	2009	Ann Intern Med	RCT	I	57/55	Cohort: 63 (7.9) Control: 63.5 (7.6)	Cohort: 93.0 Control: 87.3
Gomes Carreira et al.	2010	J Rehabil Med	RCT	I	20/20	Cohort: 62.8 (8.5) Control: 65.1 (10.1)	Cohort: 100 Control: 90
Davenport et al.	2012	Hand therapy	RCT	I	17/21	Cohort: 58 (11) Control: 61 (10)	Cohort: 88.2 Control: 76.2
Jahangiri et al.	2014	J Orthop Sci	RCT	I	Dextrose (DX): 30 Steroid: 30	DX: 63.9 (9.4) Steroid: 63.3 (10.1)	DX: 76.7 Steroid: 70.0
Monfort et al.	2015	Joint bone spine	RCT	I	Hyaluronic acid: 48 Betamethasone: 40	62.8	87.5
Ioppolo et al.	2018	Ann Rehabil Med	RCT	I	Extracorporeal Shockwave Therapy (ESWT): 28 Hyaluronic acid (HA): 30	ESWT: 68.03 (9.04) HA: 66.67 (8.06)	ESWT: 57 HA: 60
Malahias et al.	2021	Cartilage	RCT	I	Platelet Rich Plasma (PRP): 16 Steroid: 17	PRP: 62.8 (10.6) Steroid: 63 (11.8)	PRP: 81.3 Steroid: 81.3