Efficacy of Single Intra-articular 2% Sodium hyaluronate versus Corticosteroid injection in Isolated Patellofemoral Osteoarthritis

:A Double-Blind, Randomized Controlled Trial

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Faculty Disclosure Information

- **No Financial Conflicts to Disclose**
- All relevant financial disclosures have been mitigated.

Background:

Patellofemoral osteoarthritis (PFOA) is unicompartmental arthritis with a hallmark of anterior knee pain disturbing quality of life. Unlike tibiofemoral osteoarthritis, there is still a lack of evidence regarding intra-articular injection for isolated PF-OA patients. The purpose of this study was to evaluate the efficacy of intra-articular hyaluronic acid (HA) in comparison to corticosteroid (CS) injections for pain reduction and improvement in anterior knee function in isolated PF-OA patients.

Method:

This was a prospective, double-blind, randomized, controlled trial. Patients with isolated PF-OA from clinical and radiographic features were randomized to receive a single-shot, 2 ml intra-articular 2% sodium hyaluronate plus 0.5% mannitol or 2ml solution comprising 1 ml of 40mg triamcinolone acetonide and 1% lidocaine. With the Kujala score, the visual analog pain scale, and any adverse events, were assessed the patients six times in 6 months follow up.

Result:

A total of 60 patients were included. Both groups had significant improvement in VAS and Kujala scores from the first injection to the final follow-up ($p<0.05$). At 6 months no significant between-group difference was found for VAS and Kujala score the mean difference (95% confidence interval [95%CI]) = -4.46 (-11.2, 2.28) ($p=0.195$) and 2.56 (-4.08, 9.2) ($p=0.45$). However, in the first week, the VAS score was significantly lower in the CS group mean difference (95%CI) = 7.67 (0.96, 14.38) ($p=0.025$). There was no difference in pain during injection and adverse events between groups.

Figure 1. Consort flow diagram

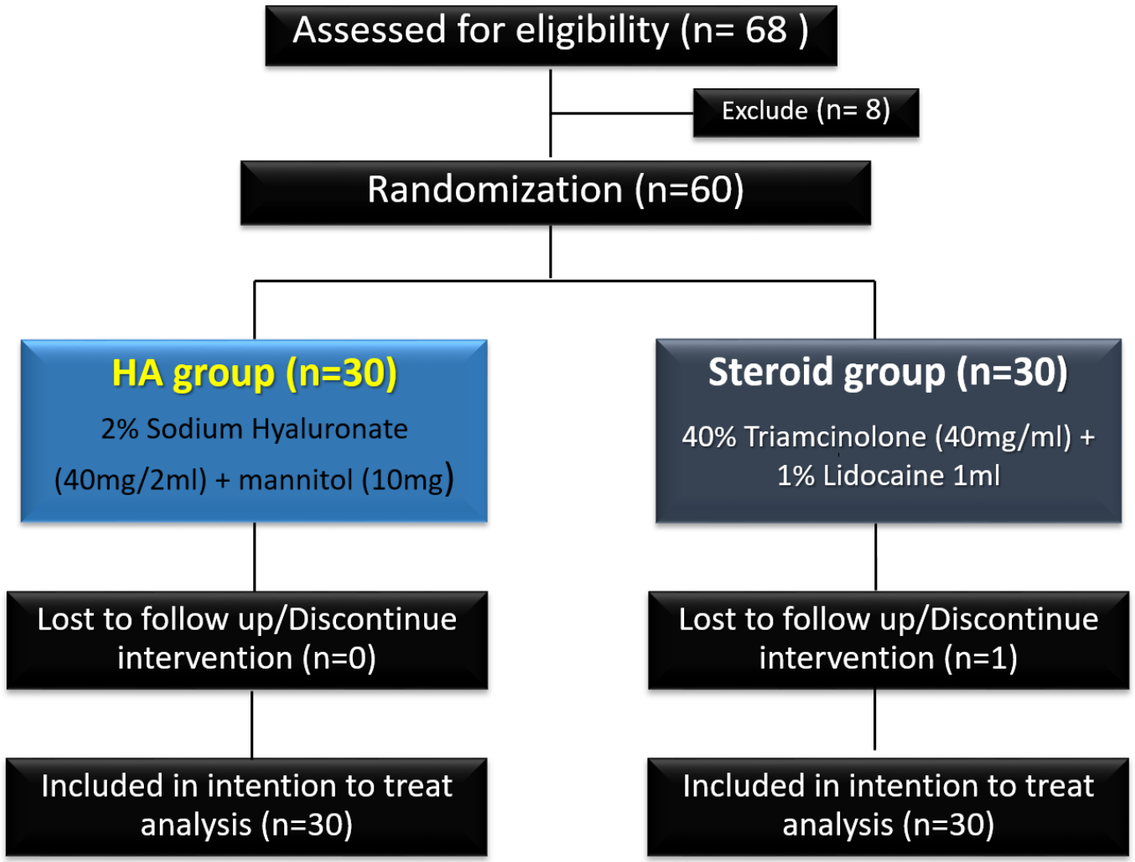


Table 1. baseline demographic and clinical characteristic of patients with PFOA

	Triamcinolone Acetonide (n=30)	Ostenil Plus (n=30)	*p*-value
Age	54.1 ± 14.62	51.4 ± 13.61	0.462
BMI	24.47 ± 3.51	25.21 ± 3.79	0.435
Side of knee			
Left	9 (30%)	15 (50%)	0.114
Right	21 (70%)	15 (50%)	
Gender			
Female	24 (80%)	20 (66.7%)	0.243
Male	6 (20%)	10 (33.3%)	
Iwano grading[a]			
1	21 (70%)	21 (70%)	1
2	6 (20%)	6 (20%)	
3	3 (10%)	3 (10%)	
Baseline VAS pain score	52.67 ± 15.96	47.67 ± 15.91	0.229
Baseline Kujala score	56.4 ± 10.92	57.63 ± 16.12	0.730

Values are number (percentage) and mean±SD

Independent t test and Chi-square test.

Table 2. VAS pain for anterior knee pain between groups along the follow up

	Triamcinolone Acetonide (n=30)		Ostenil Plus (n=30)		Mean difference (95%CI)	p-value
	Mean ± SD.	Mean change (95%CI)	Mean ± SD.	Mean change (95%CI)		
Baseline	52.67 ± 15.96	Reference	47.67 ± 15.91	Reference	-	-
48hr	28 ± 17.1	-24.67 (-29.8, -19.53)	33.33 ± 12.69	-14.33 (-18.65, -10.02)	10.33 (3.62, 17.04)	**0.003***
72hr	27 ± 16.22	-25.67 (-30.8, -20.53)	31.67 ± 12.06	-16 (-20.32, -11.68)	9.67 (2.96, 16.38)	**0.005***
1wk	21.67 ± 14.87	-31 (-36.13, -25.87)	24.33 ± 11.94	-23.33 (-27.65, -19.02)	7.67 (0.96, 14.38)	**0.025***
2wk	20.83 ± 17.12	-31.83 (-36.97, -26.7)	20.5 ± 9.5	-27.17 (-31.48, -22.85)	4.67 (-2.04, 11.38)	0.173
4wk	19.83 ± 17.64	-32.83 (-37.97, -27.7)	15.67 ± 11.04	-32 (-36.32, -27.68)	0.83 (-5.88, 7.54)	0.808
12wk	23.62 ± 15.17	-28.12 (-33.31, -22.94)	16.67 ± 10.93	-31 (-35.32, -26.68)	-2.86 (-9.6, 3.88)	0.406
24wk	26.55 ± 12.33	-25.19 (-30.37, -20.01)	18 ± 10.95	-29.67 (-33.98, -25.35)	-4.46 (-11.2, 2.28)	0.195

Generalized estimating equations (GEE), (*) significance p<0.05

Figure 2. VAS pain for anterior knee pain

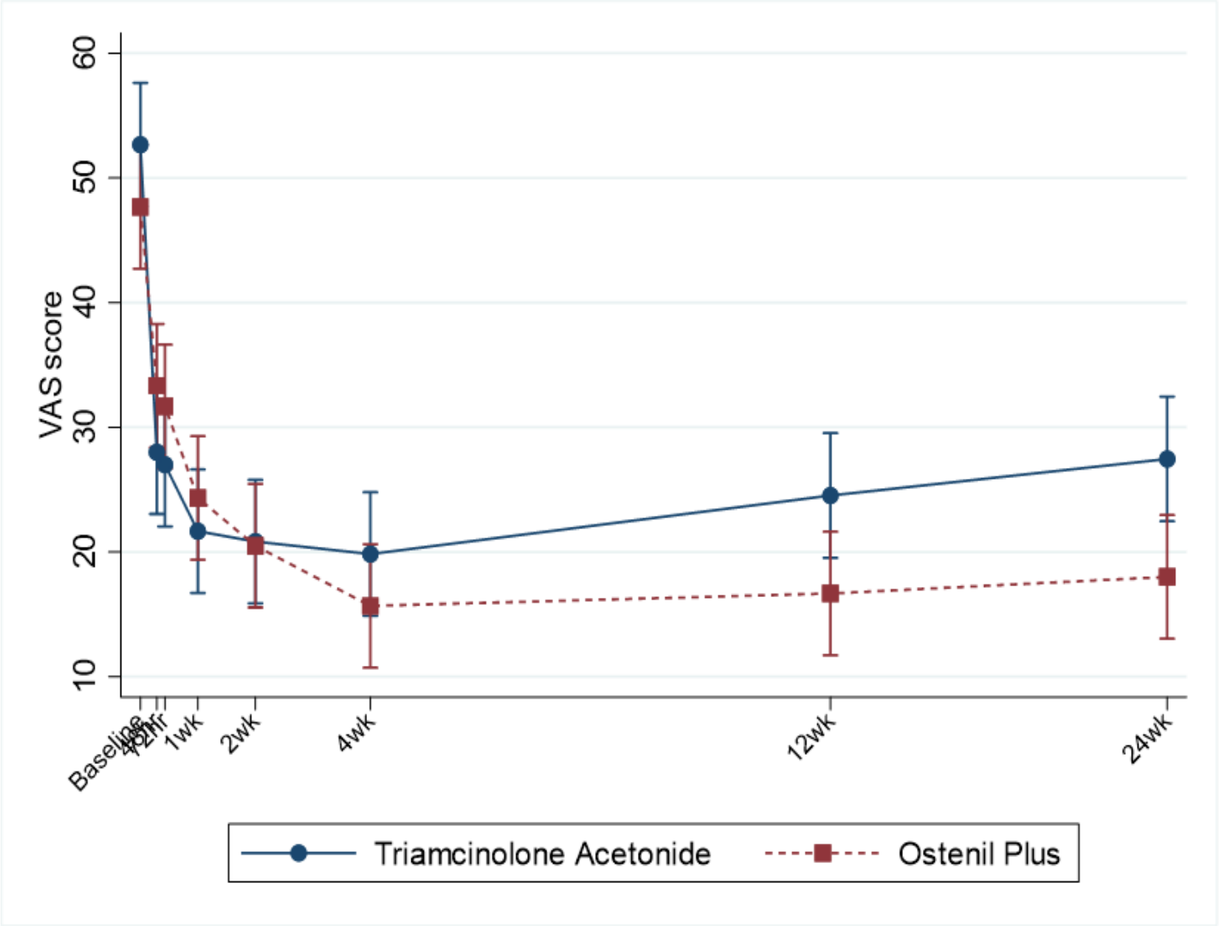
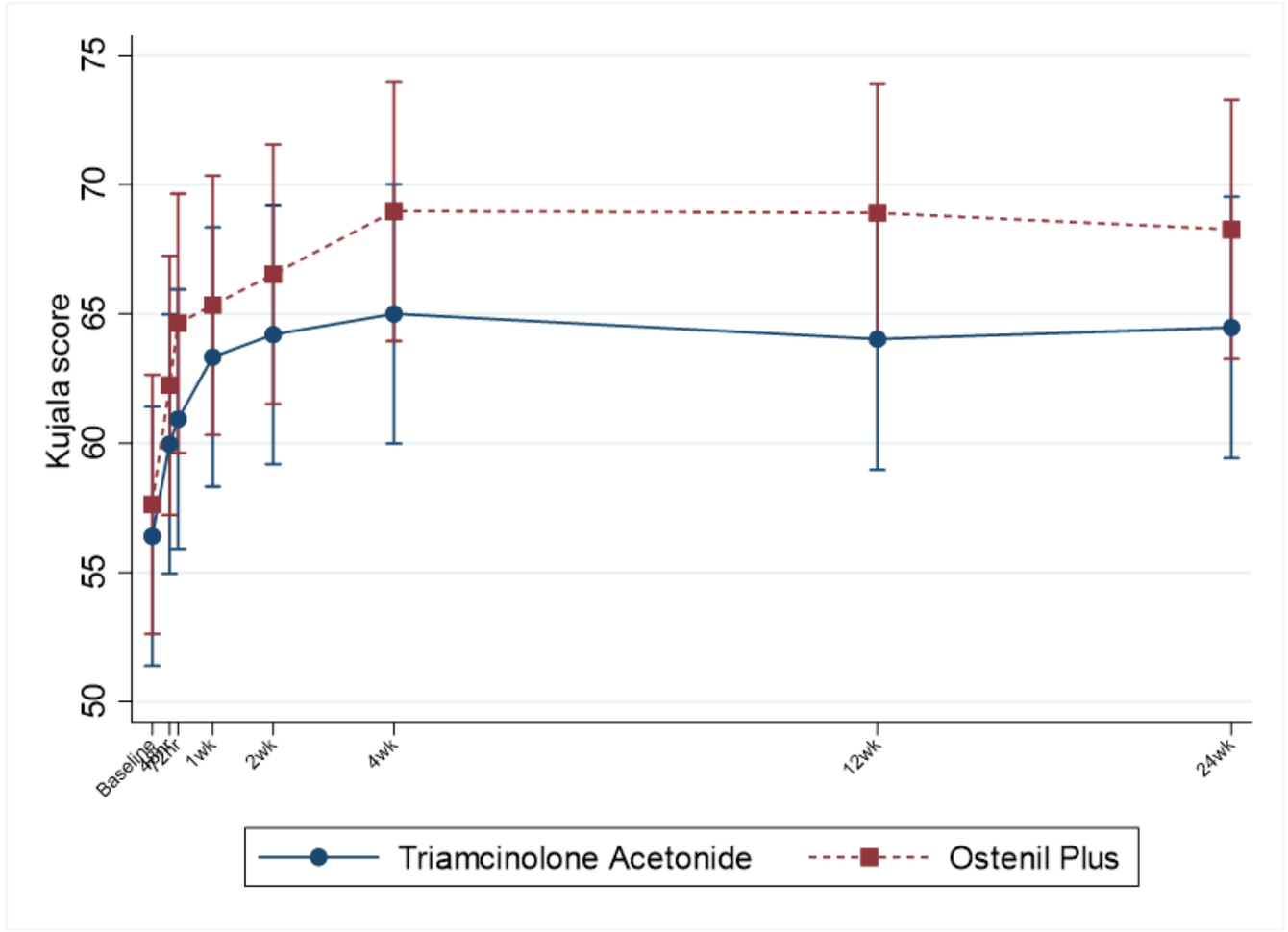


Table 3 Kujala score between groups along the follow up

	Triamcinolone Acetonide (n=30)		Ostenil Plus (n=30)		Mean difference (95%CI)	p-value
	Mean ± SD.	Mean change (95%CI)	Mean ± SD.	Mean change (95%CI)		
Baseline	56.4 ± 10.92	Reference	57.63 ± 16.12	Reference	-	-
48hr	59.97 ± 12.18	3.57 (-1.08, 8.21)	62.23 ± 17.75	4.6 (-0.11, 9.31)	1.03 (-5.57, 7.64)	0.759
72hr	60.93 ± 11.88	4.53 (-0.11, 9.18)	64.63 ± 16.71	7 (2.29, 11.71)	2.47 (-4.14, 9.07)	0.464
1wk	63.33 ± 12.96	6.93 (2.29, 11.58)	65.33 ± 16.07	7.7 (2.99, 12.41)	0.77 (-5.84, 7.37)	0.82
2wk	64.2 ± 12.49	7.8 (3.15, 12.45)	66.53 ± 16.79	8.9 (4.19, 13.61)	1.1 (-5.51, 7.71)	0.744
4wk	65 ± 11.08	8.6 (3.95, 13.25)	68.97 ± 14.98	11.33 (6.63, 16.04)	2.73 (-3.87, 9.34)	0.418
12wk	64.14 ± 13.29	7.64 (2.94, 12.33)	68.9 ± 14.78	11.27 (6.56, 15.97)	3.64 (-3, 10.28)	0.283
24wk	64.59 ± 12.58	8.08 (3.39, 12.78)	68.27 ± 14.81	10.63 (5.93, 15.34)	2.56 (-4.08, 9.2)	0.45

Generalized estimating equations (GEE), (*) significance p<0.05

Figure 3.



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Conclusion:

Intra-articular HA and CS injection provide similar pain reduction and functional score improvement at 6-months follow-up, with better pain relief in the first week for the CS group. Intra-articular HA may be an alternative option to CS, with the equivalent results but without increasing the risk of chondrotoxicity and cartilage volume loss, especially in isolated PF-OA patients which the tibiofemoral compartment cartilage is relatively preserved.

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