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Role of Intraarticular Hyaluronic Acid Injection in Osteoarthritis Knee

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I. Introduction

Osteoarthritis is one of the most common causes of knee pain affecting millions of people around the world. Osteoarthritis is a chronic progressive joint disorder characterized by pain commonly over the medial joint line and associated with varus and valgus deformity. Physical examination usually is marked by joint line tenderness, crepitus and painful range of movements. Several pharmaceutical approaches, such as analgesics, non steroidal anti – inflammatory drugs, COX – 2 inhibitors and steroids (Hochberg et al., 1995), have been proposed, with the aim of reducing pain and maintaining and / or improving joint function. Considering the limits of therapies at present available, drugs with minimal side effects are therefore warranted. Viscosupplementation by intra – articular injections of hyaluronic acid has been proposed as useful therapeutic option in the treatment of osteoarthritis in different joints. Hyaluronic acid, produced by synoviocytes, fibroblasts and chondrocytes, is a major chemical component of synovial fluid. Therefore, the restoration of the normal articular homoeostasis is the rationale for hyaluronic acid administration into osteoarthritic joints. Moreover, hyaluronic acid being a physiological component, is very likely that it may be deprived of adverse reactions, also after repeated administrations. In our study, Inj. Hyaluronic acid is found effective in osteoarthritis (grade I, II) with a gradual onset action and sustained relief. In grade III the degree of improvement is very less.

II. Aim Of The Study:

To Evaluate The Role Of Intraarticular Hyaluronic Acid Injection In Osteoarthritis Knee

III. Materials And Methods:

- The study was carried out on patients with primary osteoarthritis.
- This is a prospective study.
- Study period was from may 2014 to october 2016.
- A total of 50 patients were included in the study.

Inclusion criteria

primary osteoarthritis of the knee. Failure of non-operative modalities like NSAIDs, nutritional supplements and physical therapy. Radiological evidence of osteoarthritis such as loss of cartilage thickness, osteophyte formation, subchondral cysts

Exclusion criteria

Pregnant or lactating patients.
Grade-IV osteoarthritis.
Radiographic evidence of chondrocalcinosis.
Associated ligamentous laxity.
Ongoing infection.
History of crystalline arthropathy, inflammatory arthritis and neuropathic arthropathy.
Intra articular injection with CS within the previous 3 months.
Hypersensitivity to any of the study medications.

Initial evaluation:
Patients were evaluated initially by:

- History
- Clinical Examination
- Blood investigation
- CBC
- ESR
- CRP
- RA Factor
- Serum uric acid
- Based on the X ray, grading is done using Kellgren and Lawrence criteria
- Pre and Post injection evaluation by

Visual Analog Score (VAS)
Knee Society Score (KSS)

IV. Results:

4.1: Age Distribution
Our study comprised of 50 patients with Osteoarthritis and the mean age of patients receiving Hyaluronic acid injection was 63 years
4.2: Sex Distribution:
our study had about 25 male and 25 female patients respectively.
4.3: GRADES ACCORDING TO KELLGREN AND LAWRENCE CLASSIFICATION(KLC) OF OA :
We had 20 patients with grade-I, 23 with grade-II and 7 patients with grade-III OA knees respectively.
4.4: VISUAL ANALOG SCORE (VAS):
People in this group at the initial visit had a mean VAS of 6.52 respectively. In our study, there was a significant difference in VAS at third and sixth months compared to first month follow-up.

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Pre Op VAS	Grade I	20	5.60	.503	.112	5.36	5.84	5	6
	Grade II	23	6.87	.344	.072	6.72	7.02	6	7
	Grade III	7	8.00	.000	.000	8.00	8.00	8	8
	Total	50	6.52	.931	.132	6.26	6.78	5	8
Post op VAS 1 month	Grade I	20	4.60	.503	.112	4.36	4.84	4	5
	Grade II	23	5.04	.562	.117	4.80	5.29	4	6
	Grade III	7	7.00	.000	.000	7.00	7.00	7	7
	Total	50	5.14	.926	.131	4.88	5.40	4	7
Post Op VAS 3 month	Grade I	20	2.85	.587	.131	2.58	3.12	2	4
	Grade II	23	3.78	.422	.088	3.60	3.96	3	4
	Grade III	7	5.57	.535	.202	5.08	6.07	5	6
	Total	50	3.66	1.022	.145	3.37	3.95	2	6
Post op VAS 6 month	Grade I	20	2.85	.587	.131	2.58	3.12	2	4
	Grade II	23	3.87	.548	.114	3.63	4.11	3	5
	Grade III	7	5.29	.488	.184	4.83	5.74	5	6
	Total	50	3.66	.982	.139	3.38	3.94	2	6

Table showing mean VAS scores and SD at various follow up intervals following hyaluronic acid injection

4.5: Knee Society Score (Kss):
People in this group had a KSS of 141.18 at the initial visit. KSS increased in the third and sixth months follow-up compared to first moth follow-up.

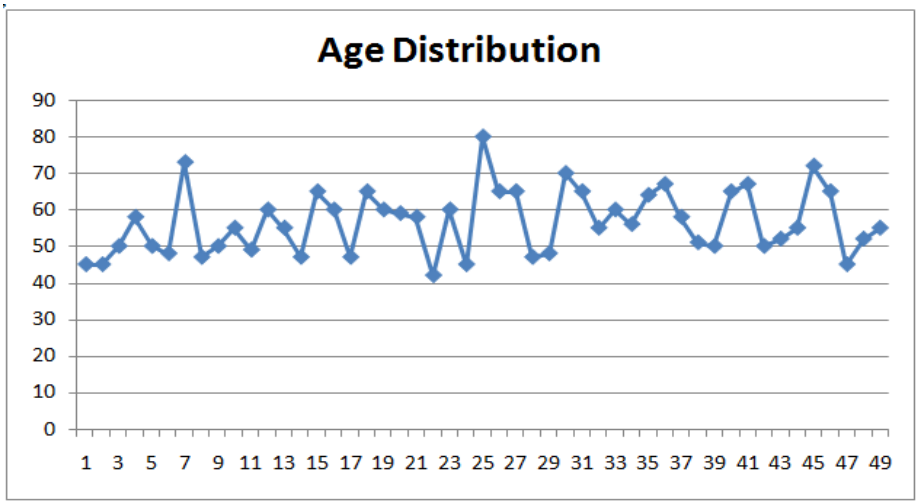
Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Pre op KSS	Grade I	20	144.00	4.472	1.000	141.91	146.09	140	150
	Grade II	23	142.61	7.209	1.503	139.49	145.73	130	150
	Grade III	7	120.00	.000	.000	120.00	120.00	120	120
	Total	50	140.00	9.897	1.400	137.19	142.81	120	150
KSS after 1 months	Grade I	20	153.75	4.253	.951	151.76	155.74	150	160
	Grade II	23	151.74	6.676	1.392	148.85	154.63	140	160
	Grade III	7	130.00	.000	.000	130.00	130.00	130	130
	Total	50	149.50	9.543	1.350	146.79	152.21	130	160
KSS after 3 months	Grade I	20	162.75	4.128	.923	160.82	164.68	160	170
	Grade II	23	162.39	3.652	.762	160.81	163.97	160	170
	Grade III	7	142.86	4.880	1.844	138.34	147.37	140	150
	Total	50	159.80	7.951	1.124	157.54	162.06	140	170
KSS after 6 months	Grade I	20	162.75	4.128	.923	160.82	164.68	160	170
	Grade II	23	157.61	3.652	.762	156.03	159.19	150	165
	Grade III	7	134.29	5.345	2.020	129.34	139.23	130	140
	Total	50	156.40	10.154	1.436	153.51	159.29	130	170

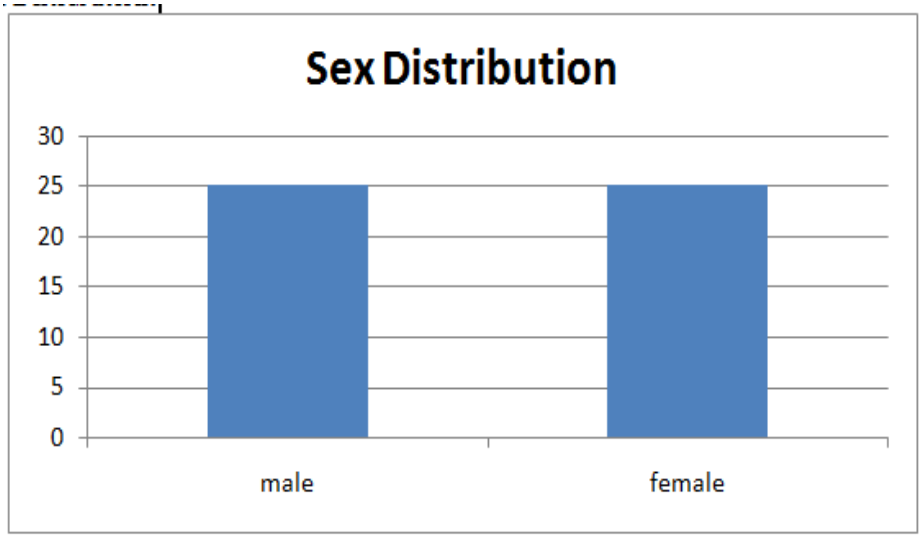
Table showing mean KSS scores and SD at various follow up intervals following HA injection

V. Tables:

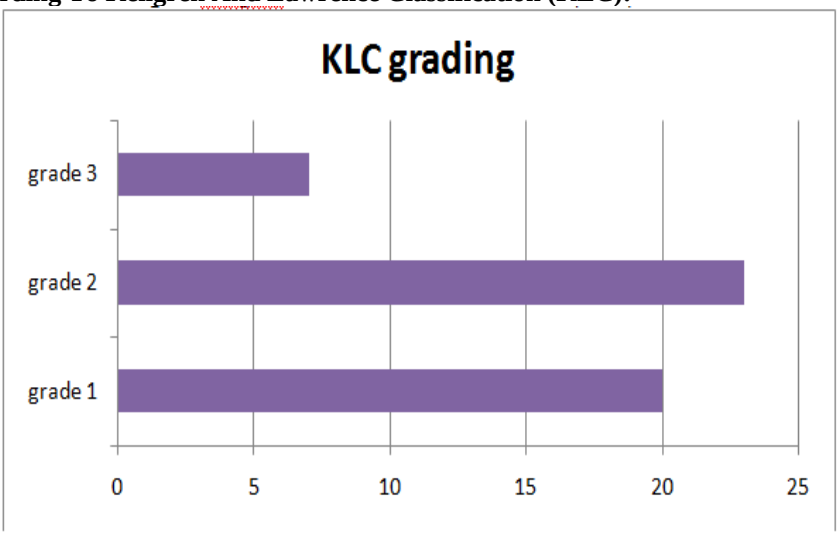
5.1. Age Distribution:



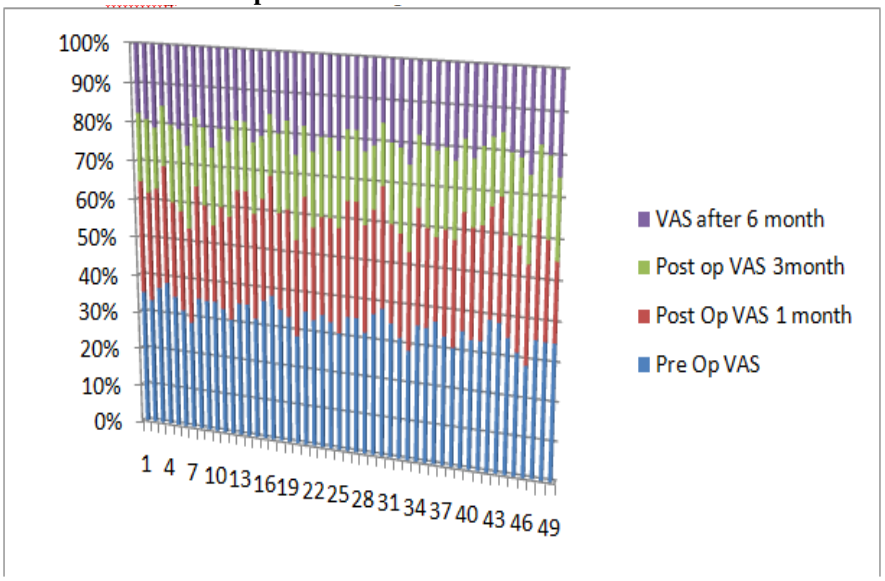
5.2. Sex Distribution:



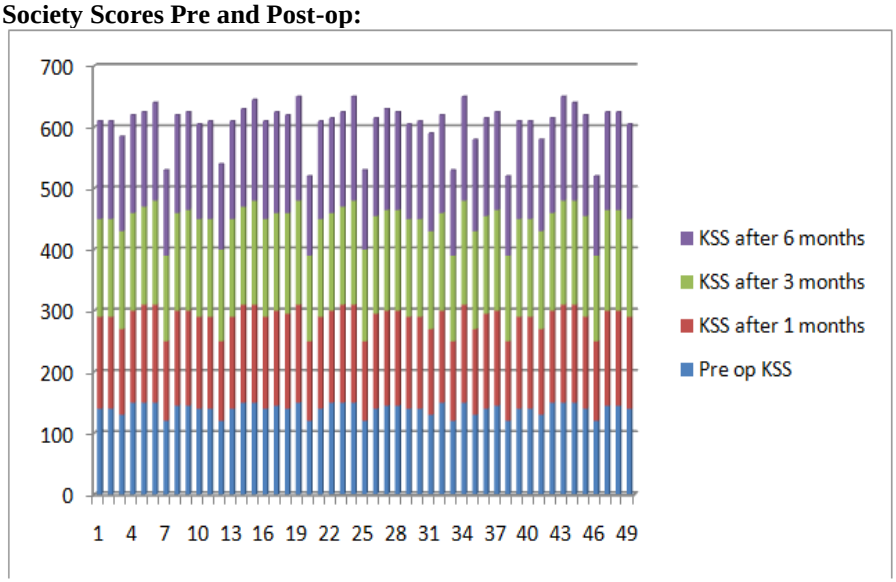
5.3. Grade According To Kellgren And Lawrence Classification (KLC):



5.4. Visual Analog Scores Pre and Post-op:



5.5: Knee Society Scores Pre and Post-op:



VI. Discussion

In recent years, numerous studies evaluated the efficacy of HA. Though different study designs and application frequencies of HA with different molecular weights, several studies demonstrated that intra articular visco-supplementation can sufficiently reduce pain, improve function and quality of life[10]. Accurate injection was associated with successful aspiration of the synovial fluid at the time of injection. Reduction in joint inflammation was in turn, associated with accurate injection. In our study we have aspirated synovial fluid before the injection in both HA group [9].

Jones et al in his prospective randomizes study reported that patients who received hyaluronic acid injections for the treatment of inflammatory knee arthritis has less pain at six months of follow up [(1)]. In another randomized clinical trial by Leardini et al concluded that HA was superior particularly in terms of duration of pain relief. The authors stated that they consider the HA to be a potential therapeutic breakthrough. However that study had a total of only forty patients, the follow up period was limited to two months. A.Skwara et al in his randomized control study on gait patterns following intra articular HA stated that single injection of high viscosity HA shows superior range of motion and pain relief as well as improvement in clinical results. This study most of the patients had full range of motion with terminal pain. Significant gait changes were not noted before the injection in most of the patients. Patients with mild gait changes showed improvement with HA injection.

Seth S Leopold et al in his study on 100 patients has used VAS, knee society score and WOMAC score to evaluate the efficacy of HA intra articular injections in OA knee. Aspiration was done to all patients prior to the injection. Patients were allowed to take NSAIDs. He concluded that patients treated with intra articular HA injection had good pain relief and function at third and six months follow up. In our study we have used VAS and knee society score for evaluation of HA injection in OA knee. We have done aspiration in all patients prior to the intra articular injection. Patients were allowed to take NSAIDs and encouraged to do quadriceps and hamstring strengthening exercises.The present study demonstrated a good treatment effects from baseline for HA.

Figures:
Case : 1

57 years old female with left side grade I OA knee. Patient underwent intraarticular hyaluronic acid injection.

Follow up scores

System	Pre op	1 month	3 month	6 month
VAS	6	4	2	2
KSS	153	171	164	159

Case: 2

64 years old female with left side Grade I OA knee. Patient underwent intra-articular hyaluronic acid injection.

Follow up scores

System	Pre op	1 month	3 month	6 month
VAS	6	4	2	2
KSS	152	168	171	173

Case : 3

60 years old female with left side grade II OA knee. Patient underwent intraarticular hyaluronic acid injection.

Follow up scores

System	Pre op	1 month	3 month	6 month
VAS	7	6	4	3
KSS	141	147	160	167

Case : 4

72 years old female with right side Grade II OA knee. Patient underwent intraarticular hyaluronic acid injection.

Follow up scores

System	Pre op	1 month	3 month	6 month
VAS	7	5	4	3
KSS	143	152	164	168

Bibiliography

[1]. SETH S. LEOPOLD, MD, BRIGHAM B. REDD, MD, WINSTON J. WARME, MD, PAUL A. WEHRLE, MD, PATRICK D. PETTIS, LVN, AND SUSAN SHOTT, PHDCorticosteroid Compared with Hyaluronic Acid Injections for the Treatment of Osteoarthritis of the KneeTH E JOURNAL OF BONE & JOINT SURGERY · JBJS.ORG VOLUME 85-A · NUMBER 7 · JULY 2003

[2]. Altman RD, Moskowitz R. Intraarticular sodium hyaluronate (Hyalgan) in the treatment of patients with osteoarthritis of the knee: a randomized clinical trial. Hyalgan Study Group. J Rheumatol. 1998;25:2203-12.

[3]. Lohmander LS, Dalen N, Englund G, Hamalainen M, Jensen EM, Karlsson K, Odensten M, Ryd L, Sernbo I, Suomalainen O, Tegnander A. Intra-articular hyaluronan injections in the treatment of osteoarthritis of the knee: a randomised, double-blind, placebo controlled multicentre trial. Hyaluronan Multicentre Trial Group. Ann Rheum Dis. 1996;55:424-31.

[4]. Dahlberg L, Lohmander LS, Ryd L. Intraarticular injections of hyaluronan in patients with cartilage abnormalities and knee pain. A one-year double-blind, placebo-controlled study. Arthritis Rheum. 1994;37:521-8.

[5]. Creamer P. Intra-articular corticosteroid treatment in osteoarthritis. CurrOpinRheumatol. 1999;11:417-21.

[6]. Adams ME, Lussier AJ, Peyron JG. A risk-benefit assessment of injections of hyaluronan and its derivatives in the treatment of osteoarthritis of the knee. Drug Saf. 2000;23:115-30.

[7]. Huskisson EC, Donnelly S. Hyaluronic acid in the treatment of osteoarthritis of the knee. Rheumatology (Oxford). 1999;38:602-7.

[8]. Wobig M, Dickhut A, Maier R, Vetter G. Viscosupplementation with hylan G-F 20: a 26-week controlled trial of efficacy and safety in the osteoarthritic knee. ClinTher. 1998;20:410-23.

[9]. Jones A, Doherty M. Intra-articular corticosteroids are effective in osteoarthritis but there are no clinical predictors of response. Ann Rheum Dis. 1996; 55:829-32.

[10]. Hunter JA, Blyth TH. A risk-benefit assessment of intra-articular corticosteroids in rheumatic disorders. Drug Saf. 1999;21:353-65.

[11]. Jones AC, Pattrick M, Doherty S, Doherty M. Intra-articular hyaluronic acid compared to intra-articular triamcinolone hexacetonide in inflammatory knee osteoarthritis. Osteoarthritis Cartilage. 1995;3:269-73.

[12]. Leardini G, Mattara L, Franceschini M, Perbellini A. Intra-articular treatment of knee osteoarthritis. A comparative study between hyaluronic acid and 6- methyl prednisolone acetate. ClinExpRheumatol. 1991;9:375-81.

[13]. Leardini G, Franceschini M, Mattara L, Bruno R, Perbellini A. Intra-articular sodium hyaluronate (Hyalgan) in gonarthrosis. A controlled study comparing methylprednisolone acetate. Clin Trials J. 1987;24:341-50.

[14]. Bellamy N. WOMAC osteoarthritis index users guide. Queensland, Australia: University of Queensland; 2000. p 1-43.

[15]. Insall JN, Dorr LD, Scott RD, Scott WN. Rationale of the Knee Society Clinical Rating System. ClinOrthop. 1989;248:13-4.

[16]. Lussier A, Cividino AA, McFarlane CA, Olszynski WP, Potashner WJ, De Medicis R. Viscosupplementation with hylan for the treatment of osteoarthritis: findings from clinical practice in Canada. J Rheumatol. 1996; 23:1579-85.

[17]. Evanich JD, Evanich CJ, Wright MB, Rydlewicz JA. Efficacy of intraarticular hyaluronic acid injections in knee osteoarthritis. ClinOrthop. 2001;390: 173-81.

[18]. Ahlback S. Osteoarthrosis of the knee. A radiographic investigation. ActaRadiol. 1968;277:7-72.

[19]. World Medical Association. WMA revises the Declaration of Helsinki. World Medical Association Newsletter; October 2000. www.wma.net. 20. Ayral X. Injections in the treatment of osteoarthritis. Best Pract Res ClinRheumatol. 2001;15:609-26. 21. Rozental TD, Sculco TP. Intra-articular corticosteroids: an updated overview. Am J Orthop. 2000;29:18-23. 22. Saffie F, Gordillo H, Gordillo E, Ballesteros F. [Intra-articular treatment of osteoarthrosis of the knee with betamethasone dipropionate and disodium phosphate. Non-controlled, open 5 years' experience]. Rev Med Chil. 1989;117:1261-6. Spanish.

[20]. Stefanich RJ. Intraarticular corticosteroids in treatment of osteoarthritis. Orthop Rev. 1986;15:65-71.

[21]. Moreland LW, Arnold WJ, Saway A, Savory C, Sikes D. Efficacy and safety of intraarticular hylan GF-20 (Synvisc), a viscoelastic derivative of hyaluronan, in patients with osteoarthritis of the knee. Arthritis Rheum. 1993;36:B143.

[22]. George E. Intra-articular hyaluronan treatment for osteoarthritis. Ann Rheum Dis. 1998;57:637-40.

[23]. Dixon AS, Jacoby RK, Berry H, Hamilton EB. Clinical trial of intra-articular injection of sodium hyaluronate in patients with osteoarthritis of the knee. Curr Med Res Opin. 1988;11:205-13.

*Dr. Ganta Varaprasad. " Role of Intraarticular Hyaluronic Acid Injection in Osteoarthritis Knee." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 16.8 (2017): 95-101