



## Treatment of osteoarthritis of the knee by intra articular sodium hyaluronate: A retrospective study

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### Abstract

**Background:** Osteoarthritis (OA) is a disease where Hyaluronic acid in the knee joints has broken down making them painful and difficult to move.

**Material and Methods:** 40 patients were taken with various grades of osteoarthritis of the knee. Three times Intra articular injection was given at an interval of two weeks. Patients were reviewed at six weeks and three months interval.

**Results:** 85% of the patients had decreased knee pain following the injection. 17 patients did not require any adjunctive therapy. 10 patients showed no improvement at all and were advised replacement surgery for the knee. However for 11 patients oral corticosteroids and analgesics were given. One of the patient had knee infection following the injection. One patient could not be contacted for follow up. Grade 1 and 2 osteoarthritis knee patients showed better results as compared to grade 3 and 4.

**Conclusion:** Intra articular sodium hyaluronate is a good, easy and safe method for treatment of knee osteoarthritis.

**Keywords:** sodium hyaluronate, osteoarthritis, knee

### Introduction

Osteoarthritis (OA) is a disease where Hyaluronic acid in the knee joints has broken down making them painful and difficult to move. The joints may swell up and change shape. It is a common cause of knee pain specially in the elderly [1]. It can affect all joints. Morbidity is higher when it affects the weight bearing joints [knee, hips]. Knee OA accounts for more than 80% of the total OA burden [2]. More than 50 years age group people are commonly affected. Various modalities of treatment such as analgesia, physiotherapy, yoga, behavioural modification, lifestyle modification, intra articular corticosteroids are given to the patient [1]. Due to limitations associated with systemic analgesics, and in those with high risk of gastrointestinal and cardiovascular complications, clinicians choose IA –HA [3]. The American College of Rheumatology has recommended IA HA for use in the treatment of OA in patients at increased risk for gastrointestinal tract adverse events as an alternative for oral agents [4]. Knee replacement surgery is considered as the last resort due to the high cost and many social stigmas specially in the developing nations like India. Sodium hyaluronate is like the fluid that surrounds the joint in the body. It acts as a lubricant and shock absorber for the joint [5]. HA is a high molecular weight, ubiquitous molecule that naturally occurs within the cartilage and synovial fluid. It is composed of alternating N-acetyl-D-glucosamine and D –glucuronic acid residues attached by beta (1-4) and beta (1-3) bonds with molecular mass ranging from 6500 to 10900 kDa [5]. HA is a sterile, visco elastic, non-pyrogenic solution that is indicated as a medical device for the treatment of pain in patients with osteoarthritis knee who have failed to

Respond adequately to conservative non pharmacological therapy and simple analgesics. It serves as a space filler to allow the joint to stay open and the regulation of cellular activities such of binding of proteins and as a mediator for cartilage repair [6]. It is simple to administer on outpatient department basis to patients. Although the exogenous HA does not restore or replace the full properties and activities of the depolymerized endogenous HA of the synovial fluid but it may induce satisfactory pain relief. Mechanism of pain relief is synthesis of proteoglycans and glycosaminoglycans, anti-inflammatory effect, and viscoelasticity maintenance. It can be considered as a much less costly treatment alternative to joint replacement surgery. Overall patient outcomes are not uniform ranging from fully satisfied to those with no benefit.

### Materials and methods

This is a retrospective review involving 40 patients seen in our hospital. The severity of the initial pain was recorded using a visual analogue score [VAS]. Three courses of intra articular injection of HA was administered to patients into the affected knee once every two weeks. Patients were reviewed at six weeks and at three months following the final injection.

Exclusion criteria: osteoarthritis secondary to trauma, previous knee surgery, ligament instability of the knee joint, those who did not turn up at three months post final injection, those who had other medications injected.

Kellgren Lawrence radiographic grading scale Grade 0 - 4 to assess the severity of osteoarthritis Knee. Pain reduction was based on VAS.

**Technique for IA injection**

- A. Patient in sitting position with legs off the side of the table
- B. patient in supine position with knee flexed 20-30 degrees
- C. Patient in supine position with knee extended [7]

Identify the tibial plateau by sliding the thumb upwards and into the joint space as well as the edge of patellar ligament. Lateral access point about 1 fingertip above the lateral tibial plateau and 1 fingertip lateral to the patellar ligament. A no touch technique is used once the area is cleaned it should not be touched with anything except sterile needles. Scrub the site and then rub in an outward fashion. 2% chlorhexidine and 70% isopropyl alcohol is used for scrub. Local anesthetics can also be used with 25 G needle. With knee flexed to 90 degrees, advance the HA syringe parallel to the floor in a posteromedial direction to a depth of about 3 cm. A give way feel is there when needle breaches the joint capsule [8].

**Results**

40 patients were taken in this study. Ranging from 38 to 90 years. There were 7 male and 35 females [Ratio 1:5]. On radiological evaluation 30% [12] patients were noted to have grade 4, 20% [8] had grade 3, 20% [8] with grade 2 and 22.5% [9] with grade 1 and 7.5% [3] grade zero. One patient was lost in the follow up after 2 injections. One had knee infection after second injection following which he was managed on injectable antibiotics and discharged after a week. 42.5% patients (17) were satisfied with pain reduction. 27.5% (11) patients required supplemented oral analgesics and corticosteroids. 25% (10) patients had no improvement at all and knee replacement surgery was advised to such patients.

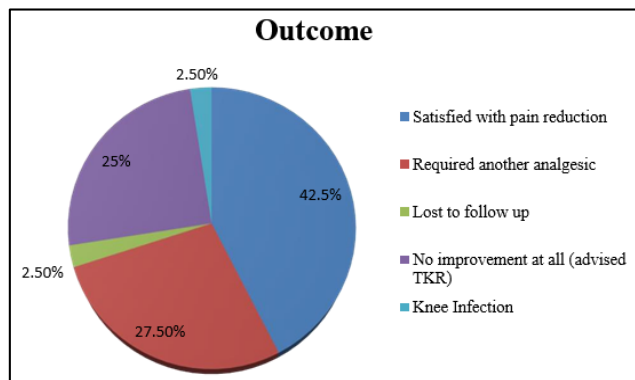


Fig 1

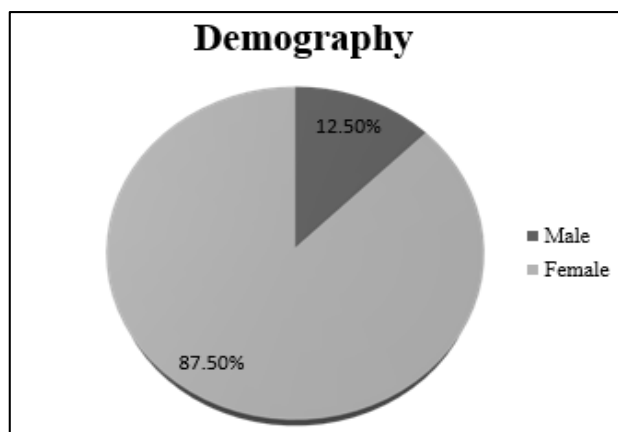


Fig 2

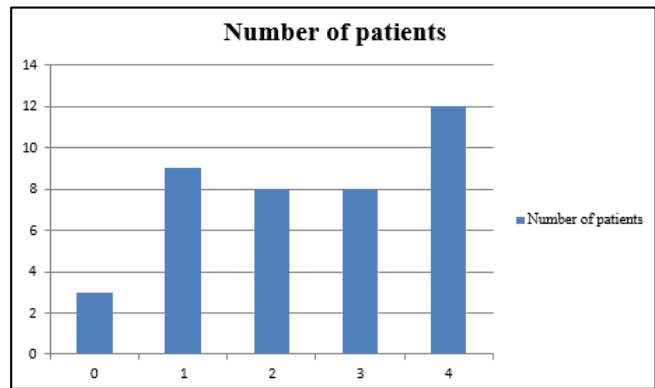


Fig 3

**Number of patients according to Grades of OA knee (Kellgren Lawren classification)**

Side effects of the technique: skin rashes, Itching, swelling of the face, lips or tongue coughing, wheezing or breathlessness be swimming or redness, arthralgia, arthrosis, non-specific pain and headache [9, 10]. Patients were advised ice packs for such symptoms which resolved in a week

**Discussion**

IA – HA can be safely used in patients with mild to moderate OA. It helps in reducing the sign and symptoms of osteoarthritis [11] In this study patients were followed up at six weeks because maximum benefit of the injection is seen at this time. Second follow up was at three months which showed that the results were maintained. Patients in group 0,1 & 2 were considered to have mild OA while those in group 3& 4 had severe OA [12]. This procedure does not reverse the arthritic process.

The American college of Rheumatology recommends the use of IA-HA injection for the treatment of OA of the knee in adults, in accordance with the ACR 2012 OA guidelines. HA is clinically indicated for the management of OA in patients who are not good candidates or who do not respond to other treatment options. Agency for Healthcare research and quality (AHRQ) systemic review states that HA improves function, health related quality of life and may delay TKA specifically in those aged >65 years. Limitations being medicare specific and no appropriateness criteria. American Medical Society for sports medicine recommends the use of HA for the appropriate patients with knee OA. The Amelia study results showed that intraarticular injections of HA improved knee osteoarthritis symptoms for upto 1 year. Yan, *et al.* showed that intraarticular injection of 6ml hylan G-F 20 was effective in providing statistically significant pain relief and functional improvement upto 1 year in Chinese patients with primary knee OA [13].

**Conclusion**

Osteoarthritis is a chronic progressive disease of unknown etiology causing destruction of cartilage and underlying bone. Most common symptom is pain. Intra articular HA should be considered in patients with significantly symptomatic OA who have not responded adequately to non-pharmacological and pharmacological treatments and in those patients who have GIT problems due to NSAIDS [14]. Total knee replacement can be

delayed in younger patients by use of intraarticular HA <sup>[15]</sup>. Compared with patients without arthritis, the synovial fluid of patients with OA has lower viscoelasticity and a reduced concentration and molecular weight of hyaluronic acid <sup>[16]</sup>.

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