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Intra-articular Injections Just Delay Joint Replacement Surgery

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Abstract

Aim: Intra-Articular (IA) Injections are widely utilized across orthopaedics, rheumatology, and sports medicine clinics in India mostly in cities, to treat localized joint pain and inflammation. Intra-articular injections contain either corticosteroids, or hyaluronic acid, or platelet-rich plasma (PRP) or local anaesthetics etc. The choice of injections depends on the condition being treated like Osteoarthritis (OA), Rheumatoid Arthritis (RA), gout, or sports-related tissue trauma. While Corticosteroids help reduce inflammation and swelling in the joint, Hyaluronic acid lubricates the joint and helps reduce pain, especially in osteoarthritis and PRP uses the patient's own blood to promote healing of tissues & local anaesthetics provide immediate pain relief and biologics stimulate tissue healing reduce pain. The injection is performed under sterile conditions, some orthopaedics use ultrasound or X-ray to guide and ensure accurate placement of the medication into the joint.

Key benefits of Intra-Articular Injections for Joint Pain include

1. Targeted pain relief,
2. reduction of inflammation
3. improved mobility and quality of life
4. minimally invasive procedure and
5. varieties of medications to address key causes of joint pain.

Materials and Methods: This review is based on 4 cases the author followed in 2026 in Bengaluru. Two cases of osteoarthritis both women in their 70 years of age, one male of 52 years with Hip OA, and fourth case of a male physician aged 83 years of spinal cord for backache, all as the evidence of AI role being just delaying Joint Replacement Surgery.

Outcomes: All of them had temporary relief for few days to a year. One of them author's wife is scheduled to undergo bilateral knee replacement soon. Despite being a temporary measure, the global osteoarthritis injectable market is estimated to be around USD 8.30 Billion in 2025 and projected to increase to USD 8.85 Billion in 2026 and USD 15.15 Billion by 2034.

Keywords: Body Mass Index; Corticosteroids; Hyaluronic Acid; Osteoarthritis; Frozen Shoulder

Abbreviations: OA: Osteoarthritis; FS: Frozen Shoulder; IAI: Intra-articular Injections; LA: Local Anaesthetics; CS: Corticosteroids; HA: Hyaluronic Acid, PRP: Platelet-Rich Plasma; YLD: Years Lived with Disability; RA: Rheumatoid Arthritis; THA: Total Hip Arthroplasty; IACI: Intra-Articular Corticosteroid Injection; BMI: Body Mass Index; NSAIDs: Non-Steroidal Anti-Inflammatory Drugs; TKA: Total Knee Arthroplasty

Introduction

Joints pain driven by osteoarthritis (OA) affects roughly 6% to over 7% of the global adult population, with rates climbing sharply in populations aged 50 and older. Prevalence and incidence are consistently higher in females and adults aged 66 and older. Aging, female sex, genetic/hereditary predisposition, and post-menopausal status are some of the known risk factors. High body-mass index (overweight/obesity), occupational ergonomic strain (e.g., heavy lifting, repetitive kneeling), and past joint trauma are some of the Exogenous and modifiable factors. Musculoskeletal joint disorders are a primary contributor to years lived with disability (YLD) and significant socioeconomic healthcare costs. Joints pain, primarily driven by osteoarthritis (OA), is a leading cause of global disability. As populations age and obesity rates rise, the prevalence of chronic joint conditions is expanding exponentially [1].

Intra-articular injectable drugs are medications administered intra-articularly to address the pain, stiffness, and decreased mobility caused by osteoarthritis. This technique can be employed on the knees, hips, and shoulders and functions as a method of avoiding surgery and improving the functional capacity of the patients. They effectively bridge the gap between oral medications (like NSAIDs) and major joint replacement surgeries [2,3,4,8]. Osteoarthritis (OA) is the eighth leading cause of global disability. The knee is the most frequently affected large joint, with a global prevalence of roughly 4.5 % of total population. Hip osteoarthritis is also widespread, affecting about 1 in 14 adults globally followed by Frozen shoulder (FS) which affects about 5% of the population.

Despite being a temporary measure, the global osteoarthritis injectable market is estimated to be around USD 8.30 Billion in 2025 and projected to increase to USD 8.85 Billion in 2026 & USD 15.15 Billion by 2034 [9]. While oral NSAIDs are widely available, concerns over gastrointestinal bleeding and renal toxicity have led Indian orthopaedic specialists to rely more heavily on local IA options to manage chronic pain episodes after the physical therapy fails to resolve the pain. Intra-Articular Injections have become the "Middle Ground" Therapy, due to high surgical costs, comorbidities, and the medical risks associated with total knee arthroplasty (TKA), conservative therapies are heavily favored in India. IA injections serve as a vital tool to postpone expensive, invasive surgeries [4,6].

In India, Intra-Articular Injections (IAI) are widely utilized across orthopaedics, rheumatology, and sports medicine clinics to treat localized joint pain and inflammation. The choice of injection material depends on the specific conditions- Osteoarthritis (OA), Rheumatoid Arthritis (RA), gout, or sports-related tissue trauma [6]. This review is based on 4 cases the author followed in 2026 in Bengaluru. Two cases of osteoarthritis knee in women in their 70 years of age, one male of 52 years with Hip OA, and fourth case of a male physician aged 83 years of spinal cord for backache, all as evidence of AI role just as delaying Joint Replacement Surgery or other alternative surgical interventions.

Reports

Case 1: Mrs Prabha, aged 74 years, little heavily built lady, spouse of this author suffered OA since 2018, in both knees more painful in left knee. For the first 3-4 years she used Ibuprofen in flare-ups and managed exercises, and reduced weight. In July 2025 she came across an advertisement and consulted a Pain clinic and was given a single injection of Hyaluronic acid (Hussmate) in both knees, followed by multiple supplementations of calcium, vitamin D etc. She felt relieved of the pain for nearly a year, but both knees started hurting again. Fed-up with temporary relief, she has now decided to go for Bilateral Total Knee Replacement Figure 1.



Figure 1: Simple procedure of Intra-articular Injection.

Case 2: Ms Vasanth Laxmi aged about 60 years, a friend of Ms Prabha, influenced by the relief Prabha underwent similar Intra-articular Hussmate Injection in both knees in June 2026. As of now she feels her knee pain is reduced by more than 75%. In both these cases the protocol consisted in i) a series of exercises to be performed at home, during the five days following PRP injection for two consecutive weeks (10 days in total) and oral Vit D and Calcium supplementation. The exercises were designed to reduce the inflammation treated lower limb, and strengthen hip and knee flexors and extensors, mainly by isometric work. Results were evaluated at two points: before and 2 months after the first PRP injection. Both patients did report any side effects from the treatment. Improvement in patient 1 was drastic at the two months follow-up as far as pain and functional abilities are concerned. Patient 2's improvement was less evident, probably due to the higher starting point in both pain and functionality.

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Case 3: Dr Bhat, aged 82 years was suffering from backache since 2020 and was using anti-inflammatory medicines often. Due to Gastrointestinal disturbances, he got relevant spinal nerve (L 4-5) block done using a combination of local anaesthetic and cortisone in June 2025. As of now he is managing with mild backache

Case 4: Left Hip Osteoarthritis Kenalog failure: A case reported in a 52-year-old male with mild-to-moderate left hip osteoarthritis showed that two fluoroscopically guided high-dose injections (80 mg Kenalog administered 6 months apart) led to severe pain, complete joint space loss, and femoral head collapse within 6 months, requiring a total hip arthroplasty (THA).

Discussion

Global Population data indicates that roughly 1 out of every 9 patients diagnosed with osteoarthritis receives an intra-articular corticosteroid injection (IACI), and around 40% of them require more than one injection to manage recurrent flare-ups. The knee and shoulder represent the most common sites for IA injections globally, with the first injection typically occurring within a year of the initial OA diagnosis [1,2,3].

Magnitude of the problems: Osteoarthritis affected nearly 15% of the total population in 2026. Knee is the most frequently affected joint worldwide (> 60% of cases), followed by the hand and hip. About 73% of people with OA are older than 55, and roughly 60% are female. High body mass index (BMI) contributes to over 20% of the global OA burden. Global OA cases are projected to increase significantly by 2050. In India the total number of OA cases in India is around 80 million in 2026.

General community-based and multi-site studies estimate the overall prevalence of knee osteoarthritis in India between around 35% in adult populations and among elderly populations (aged 60 and older), the pooled prevalence of knee OA is approximately 50%. Knee osteoarthritis is the most common manifestation of the disease in India, followed by hand osteoarthritis. Consistently higher prevalence, incidence, and disability-adjusted life years (DALYs) in females than males (e.g., female elderly knee OA prevalence around 60% vs. 30% in males). Higher rates are linked to aging, higher BMI/ obesity, frequent squatting, physical labour, and the use of traditional Western toilets [3]. The link between obesity and osteoarthritis extends beyond the added pressure on joints, with weight management offering a practical way to support joint health and mobility.

Osteoarthritis makes everyday activities such as walking, climbing stairs and getting up from a chair increasingly difficult. While ageing plays a role in its development, excess body weight is another important factor, particularly in knee osteoarthritis. The strain on the joints is only part of the picture; the inflammatory effects of excess fat may also contribute to joint damage. Current evidence points to a higher risk of osteoarthritis as body mass index (BMI) increases. People with grade II obesity have up to 4.7 times the risk of knee osteoarthritis compared with those normal range BMI. The effects of obesity are not limited to the additional load carried by the knees. Fat tissue releases inflammatory substances, including leptin, tumour necrosis factor-alpha and interleukin-6, which may contribute to cartilage breakdown. Pain and reduced mobility can, in turn, make physical activity more challenging, adding to the burden of the condition [2].

Weight management deserves a place in the broader approach to osteoarthritis care. Studies suggest that losing 5–10% of body weight may help ease pain and improve physical function and quality of life in people with obesity and knee osteoarthritis. A balanced diet and suitable physical activity can support gradual, sustainable weight loss. Addressing obesity alongside joint symptoms may help people move more comfortably and maintain independence in daily life [2]. Frozen shoulder (FS) is a debilitating condition presenting with pain on rising over head touching ear and loss of movement estimated to impact up to 5% of the population at any point in time. Up to 8% of men and 10% of women of working age are estimated to be affected [6].

An intra-articular injection is a procedure used in the treatment of inflammatory joint conditions such as arthritis, tendinitis, bursitis and Carpal Tunnel Syndrome. The procedure may also be used to withdraw excess fluid from the joints. Common Injectable Agents Used in India include i) Corticosteroids to suppress acute joint inflammation and pain flare-ups ii) Hyaluronic Acid (Visco-supplementation) used for knee and other joint osteoarthritis to improve lubrication, reduce friction, and delay joint-replacement surgery iii) Platelet-Rich Plasma (PRP) which utilizes processed components from the patient's own blood to stimulate tissue healing and reduce chronic pain and iv) Local Anaesthetics & Other Agents are also used combined with therapeutics for immediate numbing, or specialized options like Botox or stem cells depending on the clinical scenario [7].

Osteoarthritis Injectable Market: Rising prevalence of osteoarthritis and increasing elderly patient population and expansion of outpatient orthopaedic centres is improving treatment access is increasing demand for injectable pain management therapies worldwide. Expensive biologics injection therapies deter their use in low socio-economic countries. Treatment modalities include hyaluronic acid injections, corticosteroid injections, platelet-rich plasma injections, and novel regenerative biologics. The market for such drugs is experiencing growth owing to the increasing occurrence of osteoarthritis, aging population, and the need for non-surgical pain relief treatment options [9].

Joint-Specific Overview

Knee Joint: Knee osteoarthritis occurs in 11% of people over 60 years old in India. A chronic degenerative disease, osteoarthritis (OA) causes a progressive loss of joint cartilage with local inflammation and periarticular bone reconstruction [3]. In addition to causing pain, stiffness, swelling, and a decrease in joint

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range of motion, cartilage lesions significantly affect quality of life. OA is caused and developed by multiple risk factors affecting the whole joint, including cartilage, subchondral bone, synovium, ligaments, and menisci [3]. Joint replacement is a well-established treatment for severe arthritis. Currently, treatment is focused on reducing symptoms and slowing the progression of the disease. Non-pharmacological treatments include patient education and self-management, exercises, weight reduction, walking supports (crutches), bracing, shoe and insole modification, local cooling/heating, acupuncture, and electromagnetic therapy. Pharmacological treatments include topical and oral NSAID, intra-articular (IA) injections of corticosteroids and PRP for knee osteoarthritis and effusions. Ultrasound-guided corticosteroid or PRP injections significantly boost accuracy (raising placement rates from ~26.7% with landmark guidance to 86.7% under ultrasound) and lower procedural pain scores. However, various conservative and medical modalities including IAI have not resulted in satisfactory results in the early stages of osteoarthritis [4].

Hip Joint: Deep joint anatomy makes landmark-guided access difficult; ultrasound or fluoroscopic guidance is standard. Intra-articular injections deliver therapeutic medications directly into the hip joint cavity under ultrasound or fluoroscopic (X-ray) guidance due to the joint's deep anatomical location-to reduce pain, improve function, and delay the need for total joint replacement. Corticosteroids (Glucocorticoids) provide potent, fast-acting anti-inflammatory action to calm acute pain and joint swelling. Pain relief typically begins within 2 to 3 days and often lasts up to 12 weeks. Such therapy is usually restricted to 2 or 3 injections per year because frequent or repeated use carries a risk of accelerating cartilage damage or soft-tissue complications. Bilateral steroid arthropathy or rapid joint destruction note that repeated, high-frequency intra-articular corticosteroid injections in the hip carry risks of accelerated cartilage loss, subchondral insufficiency fractures, or rapid destruction mimicking "rapidly destructive hip disease [3,6]. High-molecular-weight formulations Hyaluronic Acid (Visco-supplementation) replaces, or supplements degraded synovial fluid to restore joint lubrication and shock absorption. It is effective for moderate hip osteoarthritis, with benefits often peaking around 4 to 6 months. PRP relieves pain and improves function up to 6 months or longer, ranking high in mid-term efficacy compared to other options [3,6] Figure 2.

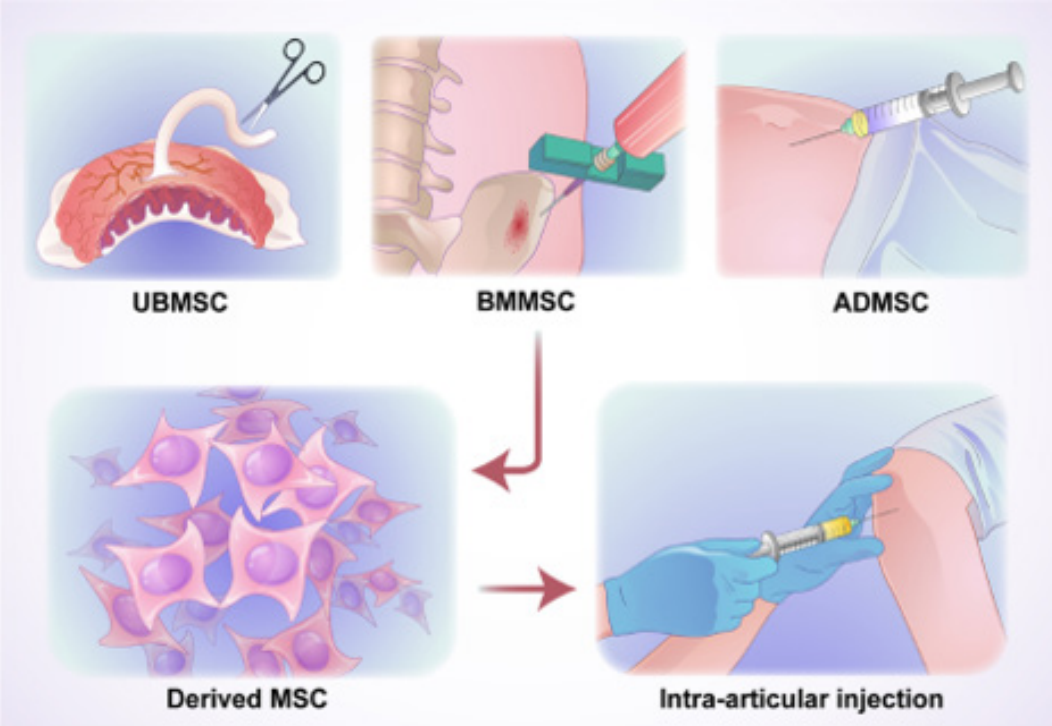


Figure 2: Formulations and Intra-articular Injection Procedures.

Shoulder (Glenohumeral) Joint: The management of glenohumeral osteoarthritis (GHOA) is challenging, particularly in patients who are not eligible for surgery. IAI treatment is an option for adhesive capsulitis, rotator cuff tendinopathy, and glenohumeral osteoarthritis. Systematic reviews have inferred overall complication rates around 7.2%, consisting of transient injection-site discomfort, subsequent total shoulder replacement rates for persistent end-stage disease hover around 3.2% [4,6].

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The procedure: involves Orthopaedic doctor's prescription, purchasing the medicine from pharmacy and reaching the procedure room in the Orthopaedics department with a prior consent or the facility will arrange on their own. This is an invasive procedure that takes about 10 to 15 minutes. Patients may experience slight pain / discomfort during the procedure. After signing a consent form, patients are settled comfortably, and the injection site is exposed, and the rest of the body is covered with a bed sheet. The site is disinfected with Povidine solution. First a local anaesthesia via injection to numb the area is administered. After few minutes the doctor administers the intra articular injection to the joint within a few minutes. Area will again be cleaned with antiseptic solution, and band aid will be applied to the site. The patient is asked to rest for 5 to 10 minutes. Immediately post procedure, patients will be asked to move the joints and may be advised pain killers. The applied band aid may be removed after a few hours [5,7] Figures 3 & 4.

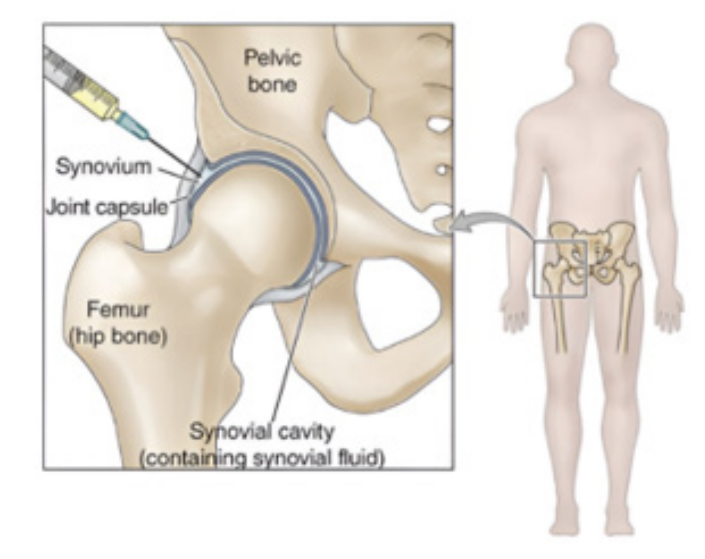


Figure 3: Hip Joint anatomy & Injection site.

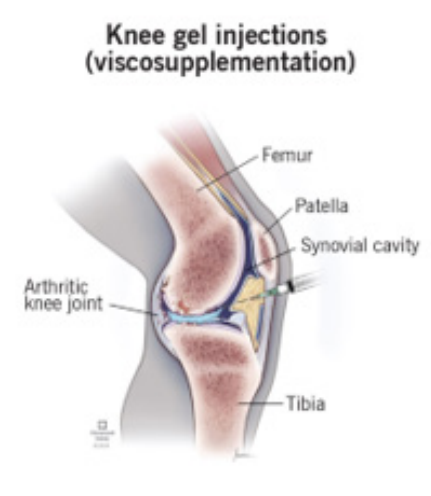


Figure 4: Knee Jel Injection site.

Medicines /Materials used: Corticosteroids (Triamcinolone acetonide, Methylprednisolone acetate) are used for Knee, Shoulder, Hip, Ankle, Wrist, and small hand/foot joints in conditions like osteoarthritis flares, Rheumatoid Arthritis, Gout, Bursitis, and Synovitis. As they have fast onset (24-48 hours) and provide short-to-medium term relief (4-12 weeks). Hyaluronic

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Acid (HA) (Visco-supplementation) is most used for Knee, Hip, and occasionally Shoulder. Mild-to-moderate Osteoarthritis (acts as a shock absorber/lubricant). It has gradual onset (starts around 2 weeks) and Longer-lasting relief (up to 6 months or more).

Platelet-Rich Plasma (PRP) (Autologous Biologics): PRP is concentrated platelets isolated from the patient's own blood, which releases growth factors (PDGF, VEGF) to calm inflammation. It is highly effective in mild-to-moderate OA; as pain is reduced for 12-24 months. It is used for Knee, Shoulder, and Ankle in conditions like early-stage Osteoarthritis, degenerative tendon injuries, tennis / golfer's elbow. It has slow onset and sustained relief (up to 12 months).

Local Anaesthetics (Lidocaine, Bupivacaine): Local anaesthetics are used for shoulder, Hip, and Knee in conditions like post-arthroscopic surgical pain control, diagnostic testing, or mixed with steroids. They have Immediate onset, but last for few hours and is used primarily for immediate pain blocks.

Bone Marrow Aspirate Concentrate (BMAC): It is extracted from the patient's pelvic bone; contains mesenchymal stem cells (MSCs) and healing cytokines and is used for moderate-to-severe joint degeneration and localized cartilage lesions Table 1.

Table 1: Medications Utilized in Intra-Articular Injections.

Indication	Primary Use	Benefits	Common Conditions Treated
Corticosteroids (e.g., Methylprednisolone)	Reduces inflammation and pain	Provides fast relief from pain and inflammation	Osteoarthritis, Rheumatoid Arthritis, Bursitis, Tendonitis
Hyaluronic Acid (e.g., Synvisc, Hyalgan)	Lubricates the joint and improves mobility	Helps restore normal joint function and reduces pain by lubricating the joint	Osteoarthritis, Joint Stiffness, Synovitis
Platelet-Rich Plasma (PRP)	Stimulates tissue repair and regeneration	Promotes healing by utilizing the body's growth factors	Chronic Tendonitis, Ligament Injuries, Arthritis
Stem Cell Therapy	Promotes regeneration of joint tissues	Accelerates healing and tissue repair	Osteoarthritis, Cartilage Defects, Joint Degeneration
Local Anaesthetics (e.g., Lidocaine)	Provides immediate pain relief	Relieves acute pain and discomfort in the joint	Joint Injuries, Post- Surgical Pain, Inflammation
Biologic Therapies (e.g., Prolotherapy)	Stimulates tissue healing	Enhances natural healing processes and tissue regeneration	Chronic Ligament or Tendon Injury, Arthritis

Medications Utilized in Intra-Articular Injections

Adipose Tissue / Stromal Vascular Fraction (SVF): Derived from the patient's own fat tissue, supplying a dense microenvironment of regenerative cells. It is merging as a strong candidate for mid-stage OA, due to its robust structural padding & anti-inflammatory properties.

Growth Factor Concentrates (GFC) & Exosomes: Acellular, purified extractions of growth factors (GFC) or extracellular vesicles, is gaining importance in Indian clinical studies, offering superior, sustained analgesic relief over traditional PRP.

Hyaluronic Acid (HA): Visco-supplementation or Gel shot that mimics natural joint fluid to provide lubrication and shock absorption. It involves delivering a gel-like substance directly into the joint to restore the shock-absorbing and lubricating properties of depleted synovial fluid. It is a not a true cell-biologic but a lubricant, but it constitutes the largest revenue segment globally and in India. It is frequently co-injected with PRP. Primarily approved and used for knee osteoarthritis when conservative measures of physical therapy, weight management, and oral or topical pain relievers have failed.

It Restores the elasticity and viscosity of the joint fluid, reduces local inflammation, and provides mechanical cushioning to protect the cartilage. Given as a series of 3 to 5 weekly injections directly into the knee space (frequently guided by ultrasound for greater accuracy). While traditional HA therapies required a series of 3 to 5 weekly injections, Indian clinical practice has increasingly transitioned toward single large-dose intra-articular HA injections.

This single-injection approach enhances patient compliance, minimizes hospital visits, and lowers the aggregate risk of injection-site infection. Single intra articular administration of hyaluronic acid progressively decreased the WOMAC score as early as 2 weeks, with the score continued to decline until 6 months of follow up. Compared to the baseline, a 43% improvement in WOMAC score was observed at 6 months, reflecting a significant clinical efficacy of Hylan GF 20. Most drastic reduction in the WOMAC score observed in the grade 2 OA subgroup followed by grade 3 and 4 OA subgroups.

The result of this study supports the use of Hylan GF 20 for the treatment osteoarthritis of knee as a single injection in public health service measures as a day care procedure [1]. Many patients

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experience functional improvement and delayed need for knee replacement surgery. Temporary injection-site pain, stiffness, warmth, or mild joint swelling. Rare acute pseudo- septic or severe inflammatory reactions do occur shortly after the injection. A very small risk of serious joint infection (septic arthritis) exists with any intra-articular procedure.

Intra-articular ortho-biologic injections (IAOBI): IAOBI utilize natural cellular materials to reduce inflammation, promote tissue healing, and manage degenerative conditions like osteoarthritis (OA) as non-surgical joint preservation therapies. There are at least 5 such products used in India and globally too. To optimize efficacy, modern protocols mandate that Ortho-biologic therapies must be administered using ultrasound or fluoroscopic imaging rather than "blind" landmark injections, ensuring the agent settles directly into the exact joint space. Orthopaedic doctors recommend their use with customized physical therapy, weight management, and joint-unloading exercises for efficient outcomes, but not stand-alone miracle cures.

Platelet-Rich Plasma (PRP): PRP belongs to a category of treatments called Ortho-biologics, which attempt to harness the abilities of natural substances in the body to reduce inflammation and promote the healing of injured or degenerated tendons, ligaments, muscles, and joints. With PRP, that substance is a component of blood namely platelets. Platelets aid in clotting. They also contain substances that can potentially reduce inflammation and pain. PRP is the most widely used Ortho-biologic agent, and the most extensively studied application is knee osteoarthritis.

PRP is a concentrate of platelets, which reduces proteins and substances called cytokines that promote inflammation. Such injections are considered if patients haven't gotten relief with measures like physical therapy, exercise, and pain medications for their achy, stiff, arthritic knee, and the patients are not yet ready for a knee replacement. Protocols combining PRGF-(Eldoret) knee injections with home-based rehabilitation show dramatic improvements in pain and functional scores over 2-month to 12-month periods. Relief is substantial in early- to mid-stage degeneration, though "complete" relief is rarely permanent [8].

Osteoarthritis Injectable Retail Charges

Osteoarthritis injectable prices in the Indian retail and wholesale market range from ₹1,200 to ₹25,000+ per vial or injection, depending heavily on the type of medication, brand, molecular weight, and whether it is a standard steroid, a local hyaluronic acid gel, or an imported high-tech Visco-supplement. Corticosteroid Injections retail clinic Price is around ₹1,200 to ₹3,500 per injection. Hyaluronic Acid / Visco-supplement Gel Injections cost differs based on different tiers

i) Linear, low-to-medium molecular weight Indian brands like Hyalgan or basic local formulations cost around ₹1,500 to ₹6,000 per vial

ii) Mid-Range Tier Cross-linked, single-shot or multi-dose gels like Hytasone/standard-grade sodium hyaluronate from ₹6,000 to ₹16,000 per vial and Premium / Imported Tier ultra-high molecular weight, single-dose pre-filled syringes like Durolane, Orthovisc, or Synvisc-One may cost around ₹13,000 to ₹25,000+ per vial [10]. The global osteoarthritis injectable market is estimated around USD 8.30 Billion in 2025, and project to increase to USD 8.85 Billion in 2026 and USD 15.15 Billion by 2034 with consistent growth anticipated during 2026–2034. This growth is driven by rising osteoarthritis burden and growing elderly population that are increasing demand for osteoarthritis injectables across global markets. The market is projected to grow at a CAGR of 7.0% during the forecast period.

Conclusion

Intra-articular Injections deliver therapeutic agents directly into an affected joint space, offering high local concentration with minimal systemic side effects. They are commonly used after conservative treatments like physical therapy, activity modification, and oral non-steroidal anti-inflammatory drugs (NSAIDs) fail to control arthritis pain. In comparison to physical therapy, oral analgesics, and other nonsurgical modalities, intra-articular injection therapy is characterized by enhanced safety and greater efficacy.

When contrasted with surgical intervention, intra-articular injections demonstrate a lower degree of invasiveness and incur fewer adverse reactions. The use of HA & PRP injection in the treatment of osteoarthritis knee has high efficacy and safety, being a simple, economical, and short procedure, which requires less surgical skill and can be done in OPD/Minor procedure without any major complications. The global osteoarthritis injectable market is estimated around USD 8.30 Billion in 2025, with consistent growth anticipated during 2026–2034, despite being temporary relief to delay the Total Joint Replacement.

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