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## Research paper

# A study assessing intra-articular PRP vs PRP with HMW HA vs PRP with LMW HA in early knee osteoarthritis

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## ABSTRACT

**Objective:** We aim to study the effects of platelet rich plasma (PRP) and hyaluronic acid injections in treatment of early Osteoarthritis (OA). We assess which form of HA is most beneficial and whether combining PRP and HA have a better clinical outcome.

**Design:** Data: Cases diagnosed with early knee OA in the department of Orthopedic's, K. S. Hegde Medical Academy.

**Sample Size:** Total 51 patients divided into 3 groups

- Group 1: PRP group
- Group 2: PRP with LMW HA
- Group 3: PRP with HMW HA

### Inclusion criteria

- Pain or swelling of knee >4 months
- Kellgren Lawrence 0-III on X-ray

### Exclusion criteria

- Kellgren-Lawrence >grade 3
- Rheumatoid arthritis
- Haematological diseases
- Severe cardiovascular diseases
- Infections
- Diabetes Mellitus
- Patients in therapy with anticoagulants or anti aggregants

**Study Method:** Patients selected based on inclusion criteria and using block randomisation divided into a group. Pre injection visual analogue score (VAS) and International knee documentation committee score (IKDC) proforma are done. The decided injection is then performed and the patient followed up at 6 weeks and 6 months.

**Statistics:** Paired T test

One way Anova and Posthoc test

P=0.05 significant

**Results:** All groups showed statistically significant decrease in VAS score and increase in IKDC scores with P < 0.05. LMW+ PRP injection showed the greatest difference in IKDC and VAS scores though this difference was not statistically significant.

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**Conclusion:** All injections are a beneficial form of treatment. LMW HA+PRP is the most beneficial injection all though not statistically significant.

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## 1. Introduction

Osteoarthritis (OA) is the most common disease of joints in adults around the world. Felson et al. reported that about one-third of all adults have radiological signs of osteoarthritis.<sup>1</sup> It is a clinical syndrome of joint pain characterized by the gradual loss of articular cartilage, osteophyte formation, subchondral bone remodeling, and inflammation of the joint.

Tackling the progression of the disease and attenuating the degradation of cartilage and joint health has been a major dilemma in the field of orthopedics. Many methods and treatment have been proposed in order to avoid the total knee arthroplasty. Non-steroidal anti-inflammatory drugs (NSAIDs) have been essential in treatment and highly effective in pain control but do not play any role in addressing the joint health.

Exercise and physiotherapy have been in wide agreement as adjuvant in treatment. Reduction of weight is paramount and it is well understood that the cartilage in the joint is under more insult with higher body mass indexes. Off loading braces to reduce axial forces acting on the more worn side of the joint and even tibial osteotomies to re align the entire lower limb and weight transmission have been advocated. Nutraceuticals such as chondroitin and glucosamine have been employed but are not widely accepted to have any role in prevention or effects of the disease.

Platelet rich plasma (PRP) is a sample of autologous blood, which has been prepared to have a high concentration of platelets, associated growth factors and cytokines. PRP use was first published by Marx et al, a maxillofacial surgeon who used it to fill cancellous mandibular defects.<sup>2</sup> The uses of PRP since have been many showing promising results in some fields and less so in others. The general idea being that it contains the necessary recipe of ingredients to stimulate repair and to some extent regeneration.

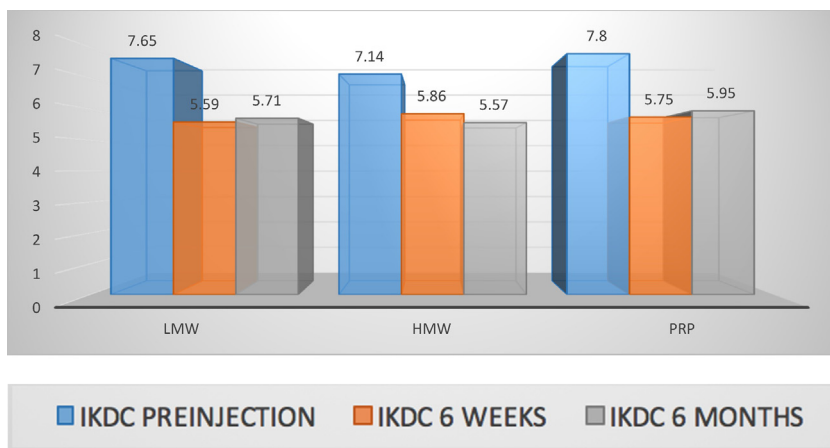
Hyaluronic acid (HA) is a glycosaminoglycan that is found throughout the connective, epithelial and neural tissue in the body. It is postulated to be an integral part of synovial fluid in that it not only stimulates cell proliferation and migration, but also serves as a

lubricant to the joint propagation.<sup>3</sup> Osteoarthritis is associated with a reduced amount of hyaluronic acid within the joint. Many different forms of the molecule have been derived varying in primary source to molecular weight and more recently combined with other drugs such as chondroitin and sorbitol.

PRP has been used in orthopedics for almost two decades now showing varying outcomes and results. The purpose of the study is to determine whether PRP and viscosupplementation have any role in the treatment of early osteoarthritis of the knee joint. For this purpose, three groups; PRP, PRP+Low molecular weight (LMW) HA, PRP+High molecular weight (HMW) HA have been made. Subjective and functional scores pre and post injection will shed light on the effect this modality of treatment has on the disease and which group of injection is the most efficacious treatment. Joint replacement addresses final stages of the condition but earlier less symptomatic knees in early stages of the condition and do not warrant surgery need better effective treatment options. We aim to evaluate platelet rich plasma and visco-supplementation as a viable treatment option for early joint osteoarthritis of the knee joint.

## 2. Materials and methods

- Study type-comparative study
- Source- All the patients with early osteoarthritis of the knee joint, presenting to the Department of Orthopaedics K. S. Hegde Charitable hospital from February 2014 to February 2016 were included in the study after explaining the procedure and getting their consent.
- Consent: Institutional ethical committee clearance and patient consent
- Methodology: a patient has been diagnosed with early OA knee, he or she was added to one of three groups randomly.
  - Group 1: PRP group (20 patients)
  - Group 2: PRP with LMW HA (17 patients)
  - Group 3: PRP with HMW HA (14 patients)
- Inclusion criteria



**Graph 1.** VAS pre injection Vas 6 weeks and Vas 6 months.

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