



THE EFFICACY OF AUTOLOGOUS CONDITIONED SERUM (ACS) IN PATIENTS WITH EARLY KNEE OSTEOARTHRITIS

Madhan Jeyaraman⁽¹⁾, Ramesh.R⁽²⁾
(1) – Post Graduate, (2) – Professor
Dept. of Orthopaedic Surgery

JJM Medical College, Davangere, Karnataka, India.



INTRODUCTION

- Percutaneous administration of “Orthobiologics” substances with osteoinductive and osteogenic properties offers the advantage of decreased morbidity associated with classic techniques.
- The desired therapeutic effect of autologous conditioned serum (ACS) is facilitated by the ability of IL-1-Ra to limit the destructive inflammatory intra-articular (IA) actions of IL-1 β .

OBJECTIVE

To investigate the effect of autologous conditioned serum (ACS) to reduce pain, improve joint function and enhance quality of life in patients with early knee osteoarthritis.

INCLUSION CRITERIA

- Patients with age between 30 – 60 years of both sex.
- Patients with radiological osteoarthritic knees (Kellgren Lawrence grade 1 & 2 based on x ray findings).
- Patients with severe pain and under anti-inflammatory treatment without improvement > 3 months.
- Patients who have given consent for treatment as per our protocol.

EXCLUSION CRITERIA

- Patients with haemoglobin < 10 gm/dL and platelet count < 10⁵ / μ L.
- Patients with corticosteroid injection at treatment site within 3 months.
- Patients with local infection at the site of the procedure and other systemic disorders.
- Patients with advanced osteoarthritis (Kellgren Lawrence grade 3 & 4 based on x ray findings) and rheumatoid arthritis or polyarticular arthritis.
- Patients refusal for PRP treatment as per our protocol.

MATERIALS

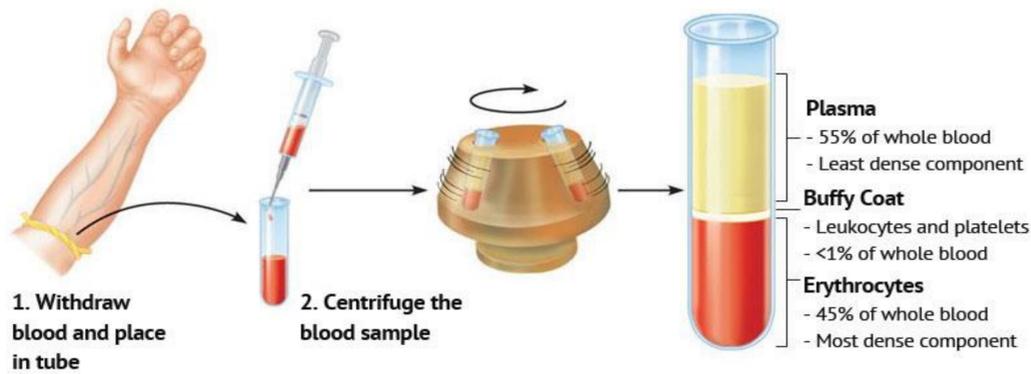
- Study design – Prospective cohort study
- Study place – Department of Orthopedics, JJM Medical College
- Study period – June 2016 to May 2017 (12 months)
- Sample size – 50
- Sampling technique – Convenient sampling
- Statistical analysis – Repeated measures ANOVA test

METHODS

- 50 patients who had mild to moderate knee osteoarthritis have been taken up for the study after obtaining informed and written consent.
- Venous blood from 50 patients with symptomatic knee osteoarthritis was conditioned and injected into the affected joint under ultrasound guidance as per treatment protocol.
- Each patient received a total of six ultrasound-guided intra-articular injections at day 0, 7, 14, 60, 120, and 180 and followed for up to one year.
- Treatment outcome measures were assessed at each visit using
 - a) Visual Analog Pain Scale (0 – 10)
 - b) Knee Osteoarthritis Outcome Score (0 – 100)
 - c) WOMAC score (0 – 96)

PREPARATION OF AUTOLOGOUS CONDITIONED SERUM (ACS)

10 ml of venous blood from antecubital vein
↓
Add glass beads in citrate tubes along with venous blood and incubate at 37 °C for 13 – 30 mins
↓
Centrifuge at a rate of 3000 rpm for 10 mins
↓
Separate supernatant plasma & re-centrifuge at a rate of 5000 rpm for 10 mins
↓
Separate Platelet Poor Plasma (PPP) and Platelet Rich Plasma (PRP) & filter the components via biological filter
↓
Resultant PRP (ACS) is injected into joint space under ultrasound guidance

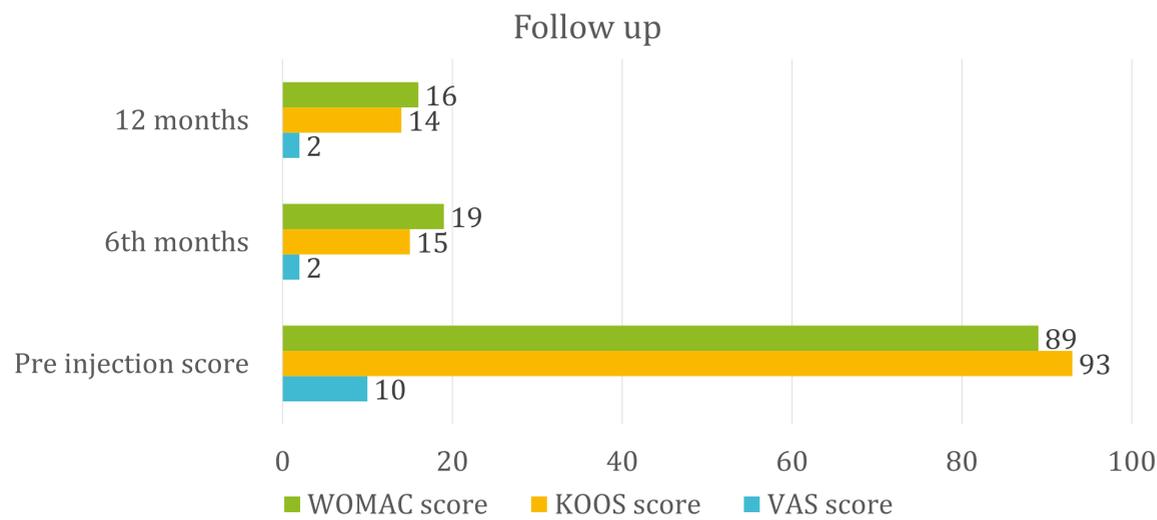


Preparation of Autologous Conditioned Serum (ACS)



Resultant ACS

RESULTS



- A total of 84% of patients reported better pain control at 6 months with 91% of patients reporting improvement at 12 months.
- A statistically significant improvement ($p < 0.045$) is observed with WOMAC ($p < 0.04$) & KOOS score ($p < 0.05$) in knee osteoarthritis patients over 12 months.
- No adverse reactions like swelling, acute pain or infection were noted.



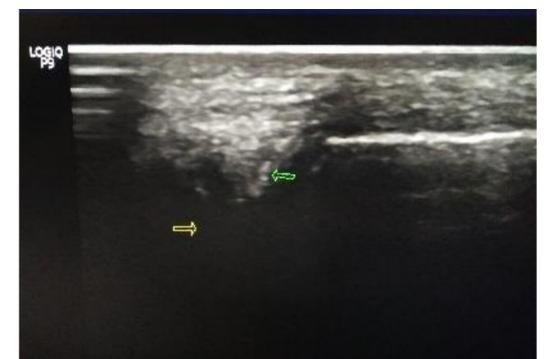
X ray - B/L Knees AP view showing Grade I OA Knees



Intra articular injection of ACS (Left Knee)

DISCUSSION

- At the end of 12 months, the average VAS score was 2, KOOS score was 14 and WOMAC score was 16.
- Autologous Conditioned Serum (ACS) injections have proved in reducing pain, improve joint motion & function and enhance quality of life in patients with early knee osteoarthritis.



USG guided intra articular ACS injection

CONCLUSION

- Autologous Conditioned Serum (ACS) has the potential to offer disease modifying, chondroprotective and biological & molecular approach in treating pain and functionality in patients with mild and moderate knee osteoarthritis.
- Potency of the ACS injection is not validated.
- Longer duration of follow-up is needed for the evaluation of long term benefits of Autologous Conditioned Serum in Early Knee Osteoarthritis.

REFERENCES

1. Baltzer AWA, Moser C, Jansen SA, Krauspe R. Autologous conditioned serum (Orthokine) is an effective treatment for knee osteoarthritis. *Osteoarthritis and Cartilage* 2009; (17): 152-60.
2. Akedaa K, An HS, Okuma M. Platelet rich plasma stimulates porcine articular chondrocyte proliferation and matrix biosynthesis. *Osteoarthritis Cartilage* 2006; 14(12): 1272-80.
3. Gobbi A, Karnatzikos G, Mahajan V, Malchira S. Platelet rich plasma treatment in symptomatic patients with knee osteoarthritis: Preliminary results in a group of active patients. *Sports Health*. 2012 Mar;4(2):172-72.