

Evaluation of role of Platelet rich plasma injection in Osteoarthritis knee

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Abstract

Osteoarthritis knee is a common disorder in older age. A number of remedies has been tried for osteoarthritis knee but they does not affect the pain, function and course of disease, especially in early stage. The study was prospective study with 30 patients having bilateral osteoarthritis knee. In this study we are trying to evaluate the role of platelet rich plasma injection in the case of osteoarthritis knee. It has been observed that maximum benefit of PRP injection was at 6 weeks. When we see the separate components of WOMAC score, maximum improvement was seen in the WOMAC pain subscale which is followed by the physical function subscale. The stiffness subscale showed the least improvement. This study showed that, intra-articular injection of autologous PRP is a safe, cost effective, practical, easy method to prepare and use, and has a therapeutic role in early knee OA.

Key words –Osteoarthritis knee, PRP injection.

Introduction

Osteoarthritis knee is a common disorder in older age. A number of remedies has been tried for osteoarthritis knee but they does not affect the pain, function and course of disease, specially in early stage. In this study we are trying to evaluate the role of platelet rich plasma injection in the case of osteoarthritis knee. Biological therapies for focal knee osteoarthritis, such as platelet-rich plasma, have been proposed to improve clinical and structural

outcomes by delivering a high concentration of growth factors that mediate healing and remodeling.

Material and methods

The study was prospective study with 30 patients having bilateral osteoarthritis knee. The demographic profile of patients were shown in table 1. After informed consent to be included in the study, the patients of bilateral osteoarthritis knee with age 40 to 70 years, Kellgren and Lawrence grade 1,2 and 3 were included in the study. Patients with obvious deformity, generalized osteoarthritis, other disease associated with osteoarthritis and not given consent, were excluded from the study. After history, examination and x ray the patients were divided in Kellgren and Lawrence grade 1,2 and 3 and Severity of symptoms were assessed by Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score. In all patients three shots 10 ml of platelet rich plasma injection were injected in knee at the interval of one week. For preparations of platelet rich plasma 100 ml of blood centrifuged twice. In first spin whole blood was centrifuged at 1500 rpm for 10 minutes, this results in formation of three layers (a bottom layer composed of RBC, an upper layer composed of plasma, platelets and some WBC, intermediate layer composed of mostly WBC). The upper layer was collected and in second spin, underwent another centrifugation at 3400 rpm for 15 minutes to concentrate the platelets which result in 10-12 ml of platelet rich plasma. After the

injection the patients were observed for any complications . After injection 650 mg of Paracetamol and 500 mg of ciprofloxacin were given orally two times a day for one day. The patients were called for follow-up visit at interval of 6 week , 12 weeks and one year and evaluated with Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score.

Results

Out of the 30 patients 18 were male and 12 were female .Majority of patients were with age group 50 to 60. Most of the patients were with K-L grade 2 (20) patients followed by grade 3 (7) and grade 1(3). WOMAC score at interval of 6weeks,12weeks ,and 1 year were shown in table-2. It has been observed that maximum benefit of PRP injection was at 6 weeks . When we see the separate components of WOMAC score, maximum improvement was seen in the WOMAC pain subscale which is followed by the physical function subscale. The stiffness subscale showed the least improvement. Majority of the patients (18) complaint of pain at injection site for 2-3 days which subsided thereafter. No infection was seen in any of the patient but mild inflammatory reaction was seen in 5(16.6%) patients after second PRP injection which subsided after anti-inflammatory medication.

Discussion

This study has shown that PRP injection improved the symptoms of osteoarthritis of knee. The maximum improvement was seen at 6 weeks and as the time passes it start decreasing . At 1year the effect of PRP start vanishing. We know Platelet rich plasma contains platelet derived growth factor(PDGF), vascular endothelial growth factor (VEGF), epidermal growth factor (EGF), fibroblast growth factor (FGF) and transforming growth factor (TGF-b1,TGF-b2) which are

responsible for repair and granulation tissue formation in human body (1) these factors may be responsible for improvement of symptoms. We don't know whether PRP causes healing of articular cartilage or not . In isolated chondral lesions, healing has been seen as described in some studies.(2,3) .

It seems that this treatment is quite safe in osteoarthritis knee because of the fact that it is an autologous preparation, and hence chances of any immunological or allergic reactions are less. In our study main complication that we encountered was injection site pain and transient fullness of the joint. The same has been noted by Sánchez et al (4) . No major complication such as deep infection, muscle atrophy, deep vein thrombosis, fever, hematoma, tissue hypertrophy, adhesion formation, or other major adverse events occurred among study subjects. Similar studies by Sampson S et al. (5)], Filardo G et al. (6) , Kon E et al. (7) , Sun Y et al. [8] and Giannini S et al. [9] showed no major complication or adverse effects.

Summery

Osteoarthritis knee is a common disorder in older age. Intra-articular injection of autologous PRP is a safe, cost effective , practical, easy method to prepare and use, and has a therapeutic role in early knee OA

Conclusion

Our study showed that, intra-articular injection of autologous PRP is a safe, cost effective , practical, easy method to prepare and use, and has a therapeutic role in early knee OA. But only give short term relief to the patient .It can be used for early osteoarthritis and to delay the major surgery like knee replacement .The limitation of this study was the number of patients were less .

Table 1 : Demographic profile of patients

| Criteria | Number of patients |
|---------------|--------------------|
| Age(in years) | |
| 40-50 | 6 |
| 50-60 | 18 |
| 60-70 | 6 |
| Sex | |
| Male | 18 |
| Female | 12 |
| KL grade | |
| 1 | 3 |
| 2 | 20 |
| 3 | 7 |

Table 2 : WOMAC Score at first visit and subsequent follow-up.

| | WOMAC(Pain) (mean) | WOMAC(Stiffness) (mean) | WOMAC(Physical function)(mean) |
|---------------|--------------------|-------------------------|--------------------------------|
| Initial visit | 15.10 | 5.62 | 42.60 |
| 6 weeks | 6.20 | 3.19 | 16.86 |
| 12 weeks | 7.23 | 3.62 | 26.79 |
| 1 year | 11.25 | 3.92 | 38.10 |

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