



E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2019; 5(4): 1098-1100
© 2019 IJOS
www.orthopaper.com
Received: 09-08-2019
Accepted: 17-09-2019

Dr. Jalaluddeen Mahim Vaidyar
Assistant Professor, Department
of Orthopedics, Kanachur
Institute of Medical Sciences,
Mangalore, Karnataka, India

Dr. Hashir Safwan U
Assistant Professor, Department
of Orthopedics, Kanachur
Institute of Medical Sciences,
Mangalore, Karnataka, India

Platelet-rich plasma in the management of chronic low back pain

Dr. Jalaluddeen Mahim Vaidyar and Dr. Hashir Safwan U

DOI: <https://doi.org/10.22271/ortho.2019.v5.i4r.3179>

Abstract

Background: Platelet-rich plasma (PRP) is an autologous blood concentrate that contains a natural concentration of autologous growth factors and cytokines and is currently widely used in the clinical setting for tissue regeneration and repair. PRP has great potential to stimulate cell proliferation and metabolic activity of IVD cells *in vitro*. Several animal studies have shown that the injection of PRP into degenerated IVDs is effective in restoring structural changes (IVD height) and improving the matrix integrity of degenerated IVDs as evaluated by magnetic resonance imaging (MRI) and histology. The results of this basic research have shown the great possibility that PRP has significant biological effects for tissue repair to counteract IVD degeneration. Clinical studies for evaluating the effects of the injection of PRP into degenerated IVDs for patients with discogenic LBP have been reviewed. Although there was only one double-blind randomized controlled trial, all the studies reported that PRP was safe and effective in reducing back pain.

Keywords: Platelet rich plasma, chronic low back pain, lumbar disc degeneration, effectiveness

Introduction

Platelet-rich plasma (PRP) is an autologous blood concentrate that contains a natural concentration of autologous growth factors and cytokines and is currently widely used in the clinical setting for tissue regeneration and repair. PRP has great potential to stimulate cell proliferation and metabolic activity of IVD cells *in vitro*. Several animal studies have shown that the injection of PRP into degenerated IVDs is effective in restoring structural changes (IVD height) and improving the matrix integrity of degenerated IVDs as evaluated by magnetic resonance imaging (MRI) and histology. The results of this basic research have shown the great possibility that PRP has significant biological effects for tissue repair to counteract IVD degeneration. Clinical studies for evaluating the effects of the injection of PRP into degenerated IVDs for patients with discogenic LBP have been reviewed. Although there was only one double-blind randomized controlled trial, all the studies reported that PRP was safe and effective in reducing back pain.

Lower back pain is one of the most common ailments in today's world that will make them land in an Orthopaedics office. We do not have a definite statistics of these patients in our country but in USA according to a report it affected around twenty five lakh Americans and the total cost of the treatment was in access of one hundred crore dollars [1-4]. Another study reported the prevalence of lower back pain in a lifetime was around eighty four percent [1].

Acute lower back pain the prevalence is very high but chronic lower back pain is a condition which is pain sensed by the patient for more than three months, the prevalence was found to be twenty percent [5]. There are a plethora of causes for lower back pain and this is one area which has always challenged the practising orthopaedic surgeons. So to pin point the diagnosis the doctors needs a battery of tests which results in the rise in the cost [2]. First the anatomical structures are checked for any deviations and majority of the times without any good facility for diagnosis, it leads to nonspecific diagnosis. Evidence suggests that MRI is associated with high false positivity rates due to normal aging asymptomatic subjects also [6-9]. Against this evidence also the practice of prescribing MRI diagnostic study and pain killer prescription still goes on [10-12]. Platelet-rich plasma therapy is a non-invasive, nonsurgical biologic intervention that has gained attention in the treatment of degenerative and musculoskeletal conditions [13, 14].

Corresponding Author:
Dr. Hashir Safwan U
Assistant Professor, Department
of Orthopedics, Kanachur
Institute of Medical Sciences,
Mangalore, Karnataka, India

So this study puts in an effort to find the effectiveness of platelet-rich plasma in the management of chronic low back pain.

Aims and objectives

To study the effects of Platelet rich plasma in management of chronic low back pain due to lumbar disc degeneration.

Materials and methods

This study was conducted by the Department of Orthopaedics, Kanachur Institute of Medical Sciences, Mangalore. The study was done in thirty four cases. There were 19 males and 15 females.

Exclusion criteria

Patients who did not consent
 Patients who did not turn up after the first injection. (Initially 38 were included)

Inclusion criteria

Difficulty in performing activities

Activities	Almost impossible	More Difficult	Moderate Difficult	A little Difficult	Absolutely no difficulty
Usual routine activities at job/home	1	2	3	4	5
Extra-curricular	1	2	3	4	5
Standing up for extended period of time	1	2	3	4	5
Lifting heavy things	1	2	3	4	5
Bending and working	1	2	3	4	5
Squatting	1	2	3	4	5
Walking for 1000 steps	1	2	3	4	5
Walking up stairs	1	2	3	4	5
Pain while sleeping	1	2	3	4	5
Standing to sitting position	1	2	3	4	5

Resting pain from 0 to 10

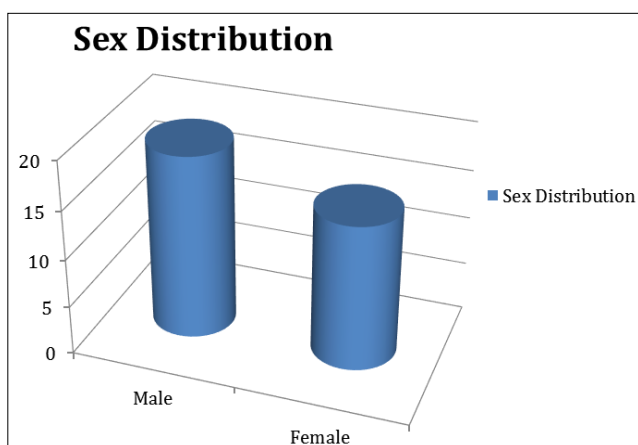
Active pain from 0 to 10

Improvement in percent.

Results

Table 1: Mean age of the subject

Mean age	Std deviation
56.39 years	±5.56 years



Graph 1: Sex Distribution

- **Disc generation: 60% of the cases were found to be at L4-L5 and 40% was found to be at L5-S1 level**

Table 2: Score based on validated questionnaire

Score	Before Study started	After treatment	p-value
10-50	24.26	41.28	<0.001 (Sig)

Patient with atleast 3 months history of pain.

Procedure

15cc of blood was drawn into two 8.5 mL ACD solution A tubes. The blood was then spun in a centrifuge, and the top layer without visible red blood cells was isolated to yield 2-cc PRP. The PRP was then split into 4-cc portions and was added to three 6-cc syringes. 1-cc of Lidocaine was added to each syringe to ensure less post-injection pain and stiffness.

The injection sites were sterilized with Chlorhexideine solution. The PRP was injected by the physician in Operation theatre under the guidance of C-Arm image intensifier. The needle passed through the transforaminal route to the desired disc space as determined by patient’s clinical examination and MRI findings, shown in figure 1.

The outcomes of interest in this study were changes to resting pain and active pain (numerical pain scale [NPS]), overall improvement (percentage scale), and function (scored questionnaire which was validated).

Table 3: Resting pain

Score	Before Study started	After treatment	p-value
0-10	6.19	2.67	<0.001 (Sig)

Table 4: Active Pain

Score	Before Study started	After treatment	p-value
0-10	8.27	2.29	<0.001 (Sig)

Table 5: Total Improvement

Score	After treatment	p-value
0-100%	61.28%	<0.001 (Sig)

Discussion

Platelet rich plasma is isolated using one’s own blood and it contains important cytokines and other inflammatory mediators that are important in modulating inflammation and this leads to angiogenesis, cell migration and proliferation of the inflammatory cells, all of these are absolutely important in the healing process [15]. Low back pain (LBP) is now regarded as the first cause of disability worldwide and should be a priority for future research on prevention and therapy. Intervertebral disc (IVD) degeneration is an important pathogenesis of LBP. Platelet-rich plasma (PRP) is an autologous blood concentrate that contains a natural concentration of autologous growth factors and cytokines and is currently widely used in the clinical setting for tissue regeneration and repair. PRP has great potential to stimulate cell proliferation and metabolic activity of IVD cells *in vitro*. Several animal studies have shown that the injection of PRP

into degenerated IVDs is effective in restoring structural changes (IVD height) and improving the matrix integrity of degenerated IVDs as evaluated by magnetic resonance imaging (MRI) and histology. The results of this basic research have shown the great possibility that PRP has significant biological effects for tissue repair to counteract IVD degeneration. Clinical studies for evaluating the effects of the injection of PRP into degenerated IVDs for patients with discogenic LBP have been reviewed. Although there was only one double-blind randomized controlled trial, all the studies reported that PRP was safe and effective in reducing back pain. While the clinical evidence of tissue repair of IVDs by PRP treatment is currently lacking, there is a great possibility that the application of PRP has the potential to lead to a feasible intradiscal therapy for the treatment of degenerative disc diseases. Further large-scale studies may be required to confirm the clinical evidence of PRP for the treatment of discogenic LBP.

Conclusion

PRP therapy reduced pain and increased functionality in patients with chronic non-specific Lower back pain.

References

1. Balague F, Mannion AF, Pellise F, Cedraschi C. Non-specific back pain. *The Lancet*. 2012;379:482-491. doi:10.1016/S0140-6736(11)60610-7
2. Bevers K, Hulla R, Rice O, Verdier G, Salas E, Gatchel RJ. The chronic low back pain epidemic in older adults in America. *Journal of Pain Relief*. 2017;6:285.
3. Martin BI, Turner JA, Mirza SK, Lee MJ, Comstock BA, Deyo RA. Trends in health care expenditures, utilization, and health status among US adults with spine problems, 1997-2006. *Spine*. 2009;34:2077-2084.
4. Nahin RL. Estimates of pain prevalence and severity in adults: United States. *The Journal of Pain: Official Journal of the American Pain Society*. 2012;16:769-780.
5. Herndon CM, Zoberi KS, Gardner BJ. Common questions about chronic low back pain. *American Family Physician*. 2015;91:708-714.
6. Ash L, Modic M, Obuchowski N, Ross J, Brant-Zawadzki M, Grooff P. Effects of diagnostic information, per se, on patient outcomes in acute radiculopathy and low back pain. *American Journal of Neuroradiology*. 2008;29:1098-1103.
7. Chou R, Huffman LH. Nonpharmacologic therapies for acute and chronic low back pain: A review of the evidence for an American pain society/American College of physicians clinical practice guideline. *Annals of Internal Medicine*. 2007;147:492.
8. Jarvik JG, Hollingworth W, Martin B, Emerson SS, Gray DT, Overman S, *et al*. Rapid magnetic resonance imaging vs radiographs for patients with low back pain: A randomized controlled trial. *JAMA*. 2003;289:2810-2818.
9. Modic MT, Obuchowski NA, Ross JS, Brant-Zawadzki MN, Grooff PN, Mazanec DJ, *et al*. Acute low back pain and radiculopathy: MR imaging findings and their prognostic role and effect on outcome. *Radiology*. 2005;237:597-604.
10. Carrino JA, Morrison WB, Parker L, Schweitzer ME, Levin DC, Sunshine JH. Spinal injection procedures: Volume, provider distribution, and reimbursement in the U.S. Medicare population from 1993 to 1999. *Radiology*. 2002;225:723-729.
11. Friedly J, Chan L, Deyo R. Increases in lumbosacral injections in the Medicare population. *Spine*. 2007;32:1754-1760.
12. Gray DT, Deyo RA, Kreuter W, Mirza SK, Heagerty PJ, Comstock BA, *et al*. Population-based trends in volumes and rates of ambulatory lumbar spine surgery. *Spine*. 2006;31:1957-1963.
13. Andia I, Abate M. Platelet-rich plasma: Underlying biology and clinical correlates. *Regenerative Medicine*. 2013;8:645-658.
14. Andia I, Latorre PM, Gomez MC, Burgos-Alonso N, Abate M, Maffulli N. Platelet-rich plasma in the conservative treatment of painful tendinopathy: A systematic review and meta-analysis of controlled studies. *British Medical Bulletin*. 2014;110:99-115.
15. Andia I, Sanchez M, Maffulli N. Tendon healing and platelet-rich plasma therapies. *Expert Opinion on Biological Therapy*. 2010;10:1415-1426.
16. Yuan T, Zhang C-Q, Wang J H-C. Augmenting tendon and ligament repair with platelet-rich plasma (PRP). *Muscles, Ligaments and Tendons Journal*. 2013;3(3):139-149.