



ISSN: 1813-1638

The Medical Journal of Tikrit University

Available online at: www.mjotu.com

العراقية
المجلات الأكاديمية العلمية
IRAQI
Academic Scientific Journals

Abdullah F. Rajaa

Rehabilitation hospital in
Tikrit –Qadesyah,
Iraq

Keywords:

intra-articular
injections of platelet-
rich plasma,
knee and tendinopathy

ARTICLE INFO

Article history:

Received 05 Sep 2020
Accepted 17 Nov 2020
Available online 01 June 2021

The Efficacy of Platelet-Rich Plasma in Rheumatological Disorders

ABSTRACT

The aim of this study is to evaluate the benefit of intra articular and intra lesional platelet-rich plasma (PRP) injections in a group of patients clinically diagnosed with primary and secondary osteoarthritis, athletic trauma and various tendinopathy and to determine the response of patients in addition to number of frequency of injections and time needed to follow up these patients. This study was carried out among 48 patients (16 males and 32 females) from Salah Eldin city whose ages distributed between 22-72 years with mean (47 years) attended to rehabilitation hospital in Tikrit. All were reviewed with history, through examination and investigation. Sample of venous blood (8ml) was aspirated and filled in a special tube containing anticoagulant citrate with addition of calcium chloride to concentrate platelets then centrifuged for 15 minutes in a dedicated centrifuge speed of 2500 cycles/minute to separate platelet-rich plasma and gelatinous material from concentrated RBCs. The result showed significant between severity of pathology and pain relief, it was shown relative response of mild to moderate osteoarthritis of knees, chondrocalcinosis, tendon sprain and partial meniscus tear. Also, this study didn't registered any post-injection infection or allergic reaction and discomfort subsided after three days.

DOI: <http://dx.doi.org/10.25130/mjotu.26.2020.17>

*Corresponding author E mail : drabdullahfattah@gmail.com

Introduction

Platelet-rich plasma (PRP) may interfere in soft tissue healing through growth factors present in platelets which are released after degranulation, thus physicians used to inject PRP for the treatment of tendon, ligament and cartilage insult and early osteoarthritis. All these diseases and injuries considered a major source of disability and health expense. Using of PRP is a simple, effective and mildly invasive method of a natural amount of autologous GFs. This method of PRP involves centrifugation of autologous blood to separate and extract the plasma and buffy coat of blood which contain high concentrations of platelets. The autologous nature of (PRP) the risk of immune rejection or disease transmission. The administration of (PRP) has ability to release a large number of chemokines, cytokines and growth factors within the joint capsule which are involved in cell signaling in the repairing of intrinsic repair mechanisms. Intra articular (PRP) injections are result in relieving pain, and improving knee function and ability of doing daily activities in younger patients.

Patients and methods

A case series study was conducted on 48 patients attended

rehabilitation hospital in Tikrit for the period from the beginning of January 2018 to the end of January 2019. Patients presented with various athletic trauma and others with mild or moderate osteoarthritis. Patients were aged 22-72 years. History and clinical examination in addition to thorough investigations were done for each of them. Aspiration of (8 cc) venous blood from same patient to be injected to a special tube contained anticoagulant citrate with addition of calcium chloride to activate concentration to platelets.

After light shaking of tube centrifuged at 2500 cycle/minute for 15 minutes then we have a tube contained blood debris dark red in color separated from plasma by gelatinous buffy coat.

After that gentle aspiration of platelet-rich plasma by spinal needle, the amount of (PRP) ranged from 2-4 ml which injected to the joint or tendon under guide of ultrasound to give perfect results. This method repeated for three times once every three weeks, all procedures were done under aseptic technique to avoid infection with advice patient to take semi rest for three days followed injection.

Results

A total number of 48 patients consisting of 32 female (66.66%) and male 16 (33.33%).

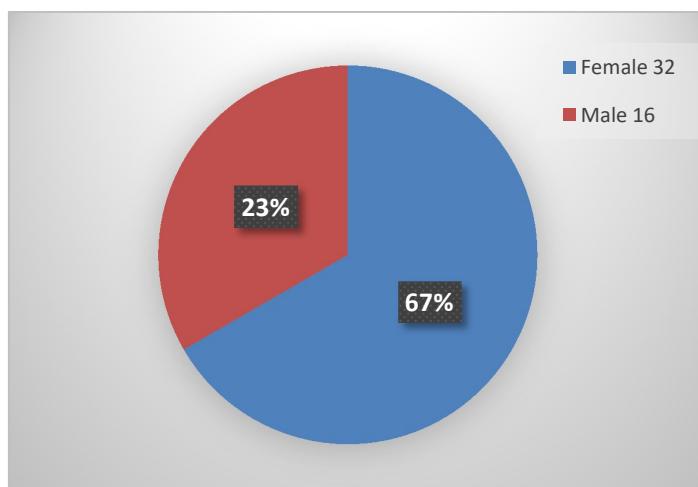


Figure 1. show sex distribution

This study done on variable athletic trauma and mild to moderate osteoarthritis.

Table 1. show the patient distribution according to disease presentation.

Disease	Female number	%	Male number	%
Mild OA one knee	10	20.8	3	6.25
Mild OA both knees	5	10.4	2	4.16
Moderate OA one knee	8	16.6	1	2
Moderate OA both knees	7	19.5	1	2
Medical meniscus (partial tear)	0	-	2	4.16
ACL (partial tear)	0	-	4	8.3
Achill's Tendinitis	2	4.16	3	6.25

This current study indicates that intra-articular injection of (PRP) are save and have satisfied effects for normal life satisfaction, pain minimized started after one week whether due to psychological support (placebo effect) or real disease modifying effect especially for patients who are not refuse operated or receiving drugs for long time.

Discussion

The overall high prevalence of osteoarthritis of knees which affected moderate and older age group like any

other populations over the world and variable athletic trauma give an idea to our experience to alleviate pain and stop degenerative process of articular cartilage in addition to rehabilitate patient to do daily activities without disturbs. This fact presents over the world wide populations and encourage scientists to continue find and seeking of solution to minimized disability and discomfort^(1,2). In this present study all process of platelet-rich plasma (PRP) done under aseptic technique to avoid post intra-articular infection which is

the aim of all physicians used this technique. Osteoarthritis is a source of pain and loss of large normal joint motion due to gradual thinning of articular cartilage and osteophyte formation^(3,4,5). It is the commonest form of joint disease, and considered the top 10 causes disability worldwide⁽⁶⁾. With aging of population and increasing obesity osteoarthritis considered as a major public health problem and an important financial burden for the population⁽⁷⁾. In this study the response to intra-articular (PRP) injections related conversely with severity of osteoarthritis in which less articular degeneration the more response to intra-articular (PRP) injections this study consistent to German study^(8,9) which revealed good response in milder form of osteopetrosis.

Intra-articular (PRP) injection is safe with no serious complication was reported in this study, only mild discomfort and swelling lasted for few days then subsided, these features are accordant to Italian studies⁽¹⁰⁾.

Medial meniscal tear is a common athletic problem affected sport younger patient who exposed to twisted or direct trauma to the knee, in this study we concentrate on partial tear especially linear tear which doesn't need arthroscopic or surgical intervention. The result in this study were good responding in addition to other measures like exercise and supportive substance. This result consistent with European studies^(11,12).

Partial tear of ligament accruing with hypovascular tissue, these tears healed by scar formation instead of normal vascular healing pathway⁽¹³⁾.

According to this study we treat partial insult of ACL (anterior cruciate ligament) of the knee and partial tear of anterior talo-fibular ligament using three successive intra-articular (PRP) injections by three weeks interval between each one and other give good results and pain relief.

Achilles tendinopathy is a common source of discomfort for both recreational and competitive athletes especially in an overuse^(14,15,16), in this study we concentrated on treatment of non-insertional achilles tendinopathy. The result gave moderate benefit in resolving pain and discomfort. These results accordant to European studies which revealed no additional benefit over conventional treatment alone^(17,18,19,20).

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