بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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Intra-Articular Injections of Platelet-Rich Plasma versus Hyaluronic Acid in Treatment of Knee Osteoarthritis

(Systematic Review and Meta-analysis)

Submitted for partial fulfilment of Master Degree in Orthopaedic Surgery

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2020

سورة البقرة الآية: ٣٢

Acknowledgment

Thanks GOD for all the blessings all through my life, including this work the people I encountered through it, the experience and knowledge I gained by passing through it.

I would never be able to express my gratitude to my family for their encouragement and support all through my life.

I would like to express my deeply felt gratitude to ***Prof. Dr. Atef Mohamed El-beltagy*** *Assistant Professor of orthopaedic surgery, Faculty of Medicine, Ain Shams University, for his kind and gentle guidance beside the valuable time he spent.*

I would like to express my appreciation to ***Assistant Prof. Dr. Zeiad M. Zakaria,*** *Assistant Professor of Orthopaedic Surgery, Faculty of Medicine, Ain Shams University, for ideas and valuable discussions throughout the process of writing the essay.*

I would like seize this opportunity to thank all my professors in Dar-Elshefa Hospital, for learning exercising and how to love orthopaedics.

I would like to thank all my friends, colleges, professors and co-workers who helped me in my way and in my work.

Mohamed Abdel-Samei Ibrahim

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List of Abbreviations

Abb.	Full term

BMI..... *Body mass index*

GFs ..... *Growth factors*

HA..... *Hyaluronic acid*

IKDC..... *International Knee Documentation Committee*

JSN..... *Joint space narrowing*

K-L..... *Kellgren and Lawrence*

NSAID ..... *Non-steroidal anti-inflammatory drug*

OA..... *Osteoarthritis*

PRP..... *Platelet rich plasma*

RCTs ..... *Randomized controlled trials*

ROM ..... *Range of motion*

TNF ..... *Tumor necrosis factor*

VAS..... *Visual analogue scale*

WOMAC..... *Western Ontario & McMaster Universities Osteoarthritis Index*

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INTRODUCTION

Knee osteoarthritis is a progressive joint disease involving intra-articular and peri-articular structures. The pathologic characteristics of knee osteoarthritis include articular cartilage lesions, synovitis, subchondral sclerosis, and osteophytosis. [1]

The current standard of care for patients with symptomatic knee osteoarthritis includes oral anti-inflammatory drugs, topical anti-inflammatory gels, physical therapy, intra-articular injections and arthroplasty. [2]

However, compliance with nonsurgical treatments is poor, and medications, such as simple analgesics and nonsteroidal anti-inflammatory drugs, are associated with adverse events. [3]

As reported in many studies and meta-analyses, intra-articular hyaluronic acid injections are widely used to treat knee osteoarthritis; hyaluronic acid injections are efficacious because the visco-induction properties of hyaluronic acid increase joint lubrication. [4,5]

During the past decade, there has been increasing interest in the use of autologous growth factors, such as intra-articular injections of platelet-rich plasma to treat knee osteoarthritis. Platelet-rich plasma is an autologous blood product that contains an increased concentration of platelets, and it has become an emerging treatment used in orthopaedic and sports medicine practices for ligament, tendon, cartilage, and bone injuries. [6,7]

AIM OF THE WORK

The purpose of this study is to perform a meta-analysis comparing between the efficacy of intra-articular injections of Platelet-Rich Plasma versus Hyaluronic Acid in treatment of knee osteoarthritis regarding pain control, limiting knee stiffness and improvement of physical function.

KNEE OSTEOARTHRITIS

Articular cartilage is a thin layer of specialized connective tissue with unique visco-elastic properties. Its principal function is to provide a smooth, lubricated surface for low friction articulation and to facilitate the transmission of loads to the underlying subchondral bone. (8)

Osteoarthritis develops most commonly in the absence of a known cause (primary osteoarthritis). Less frequently it develops as a result of joint injuries, infections, or a variety of hereditary, metabolic, and neurological disorders (secondary osteoarthritis).(9)

Osteoarthritis usually involves all of the tissues that form the synovial joint, including articular cartilage, subchondral and metaphyseal bone, synovial tissue, ligaments, joint capsule, and muscles that act across the joint. (10)

Pain is the first and predominant symptom, causing loss of function and often stiffness. “Pain” is generally sharp ache, or a burning sensation in the associated muscles and tendons. The pain is intermittent and is worse with use and better with rest.(11)

Radiological assessment:

The radiographic hallmarks of primary osteoarthritis includes: asymmetrical joint space narrowing, subchondral sclerosis, subchondral cyst, and osteophytes. The initial radiographs may not show all of the findings. However, in early osteoarthritis, minimal joint space narrowing may be the only radiographic finding. As the disease progresses, the series of above changes followed by lateral sublaxation of tibia and in very advanced stage collapse of the joint may occur. (12)

In patients with osteoarthritis of the knee, AP and lateral radiographs in standing position allow an adequate evaluation of the medial and lateral joint spaces. **Figure (1)**

Figure (1): Normal versus osteoarthritic knee. (12)

Kellgren and Lawrence (K-L) classification has been developed as a radiological grading of osteoarthritis. It determines the severity of radiographic OA on the basis of the presence and degree of osteophytosis, joint-space narrowing

(JSN), sclerosis, and deformity affecting the tibio-femoral joint. Radiographic OA of the knee usually is defined as a K-L grade of 2 or higher. [13] **Figure (2)**

The Kellgren and Lawrence system is a method of classifying the severity of knee osteoarthritis (OA) using five grades: [14]

- Grade 0: no radiographic features of OA are present.
- Grade 1: doubtful joint space narrowing (JSN) and possible osteophytic lipping.
- Grade 2: definite osteophytes and possible JSN on anteroposterior weight-bearing radiograph.
- Grade 3: multiple osteophytes, definite JSN, sclerosis, possible bony deformity.
- Grade 4: large osteophytes, marked JSN, severe sclerosis and definite bony deformity.

Figure (2): Kellgren and Lawrence (K-L) classification. [14]