

Common sports injuries and physical treatments

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Abstract. Physiotherapy is a non-invasive and non-pharmaceutical application of artificial physical factors and natural physical factors to the human body through the body's neurological, humoral, endocrine, immune and other physiological regulatory mechanisms to achieve the purpose of treatment and rehabilitation. With the widespread popularity and popularity of sports, more people are participating in sports in which injuries become common at different levels of sports from daily recreation to high intensity competitive levels. Physical therapy is considered the first choice for sports people to treat sports injuries and is becoming common and mainstream in the field of sports injury treatment and rehabilitation. Physiotherapy has become critical as a primary treatment or secondary intervention after a sports injury and make sense in the rehabilitation of sports injuries. This article focuses on the physiotherapy treatment of common sports injuries in different sports. Common sports injuries in basketball include ankle sprains, meniscus tears, Achilles tendon ruptures, and patellar tendonitis. Common sports injuries in rugby include groin injuries and shoulder dislocations. Common sports injuries in baseball include ulnar collateral ligament injuries and rotator cuff injuries. Common sports injuries in tennis include epicondylitis of the elbow joint. Common injuries in soccer include medial collateral ligament sprains and calf strains. This article analyzes the anatomical structure of the above-mentioned common injury sites, the physical means of intervention and the different roles of physiotherapy in different sports injuries. The results of the article found that physiotherapy is available for all the sports mentioned above. However, depending on the injury in a sport, physiotherapy has a different proportion of the conventional treatment modalities.

Keywords: physiotherapy, sports injury, treatment intervention, common, effectiveness.

1. Introduction

Many individuals from all around the world take part in games, sports, and contests every day. Sports participation enhances physical fitness as well as general health and wellness. Injuries sustained during games and athletic competitions can range from mild to catastrophic to lifetime medical issues. Sports-related acute trauma or chronic worry are the main reasons for these injuries. Sports accidents can cause damage to the bones, ligaments, muscles and tendons. In the world of sports, there have been many injuries. It is imperative that all teachers, trainers, and athletes are knowledgeable of the causes, signs, prevention, and treatments for all these typical injuries to prevent most of these types of injuries and update outdated training methods. In a ten-year study of NBA players' injuries from 1988-1989 through the 1997-1998 season, data showed that the first common site of injury is the lower extremity,

resulting in the most days lost [1]. Ankle injuries were the most common site for musculoskeletal injuries. This was followed by the patellofemoral complex and the knee [1].

More than 60,000 university football players and one million high school football players compete in the United States each year, making football a popular sport both here and abroad. Of all hip injuries, the most prevalent muscle strains leading to 59% of it [2]. Shoulder dislocation is one of the injuries that happens in American football. Although the rate of injury is not high by measuring how many people get injuries in the shoulder, the days lost is high among all most of the injuries [2].

A 2017 article examined elbow injuries among professional athletes from the 2011 through 2014 seasons in MLB Major and Minor Leagues, with Major League, Minor League, and all professional athletes ranking fourth in injuries to all parts of the body [3]. Lateral epicondylitis (Tennis elbow) is a common ailment, leading to discomfort and sensitivity of the elbow's common extensor origin [4]. up to half of the players can suffer from it for a variety of reasons, such as the heavy racquet or poor swing form [4]. ACL ruptures are not common in soccer, but due to the popularity and prevalence of soccer, many participants are actively involved and integrated into the sport. This has led to many ACL ruptures occurring [5].

This article focuses on common physical therapy approaches and interventions in sports injuries. This article focuses on several common sports injuries in common sports such as basketball, soccer, soccer, baseball, and tennis. This article looks at the role and effectiveness of physical therapy in the treatment of these injuries in several sports.

2. Common basketball injuries and physical treatment

2.1. Ankle sprain

The ankle joint is our closest weight-bearing joint to the ground, so the ankle joint plays a rather important role in our daily life and sports. Because the joint is wide at the front and narrow at the back, the outer ankle is lower than the inner ankle, and the lateral ligaments are weaker than the medial ligaments, it is unstable and prone to injury when it is in a plantarflexed inversion (when it lands after shooting or jumping for a rebound) position. The lateral collateral ligaments of the ankle are composed of the anterior talofibular ligament, the posterior talofibular ligament, and the calcaneofibular ligament. Injuries to the three ligaments mentioned above are the focus of inversion ankle sprains [6]. Lateral ankle sprain: Seventy-five percent of all ankle injuries are ligament injuries, and inversion trauma accounts for 85% of all ankle sprains [7].

An ankle sprain, which frequently results from twisting or turning, is a highly frequent basketball injury. An ankle sprain is an injury to the soft tissue, typically a ligament, of the ankle. Ice or electrical stimulation may be used as part of the therapy to reduce the pain and swelling. With the advancement of bracing technology, it is now possible to get semi-custom, movable supports for ankles [8]. During the recovery phase, joint mobilization or balancing exercises can aid to improve mobility and develop the ankle's surrounding muscles.

2.2. Meniscal tear

As a crucial stabilizer and lubricant, the meniscus oscillates inside the knee joint. The meniscus is crucial for all the movements that the knee joint must do, and when it slips erratically, it can result in compression or even rupture, inflicting harm. All types of hops, spins, and direction changes must be made swiftly, particularly in basketball. The tibiofemoral joint is rotated or compressed when the knee joint is flexed and stretched, the lower leg is abruptly abducted and externally rotated, or internally abducted and internally rotated. The meniscus is vulnerable to injury from uncoordinated sliding. Overuse of the knee during basketball play can also result in meniscal tears. The mechanism of meniscus tear is caused by sudden changes in direction with foot fixed on ground, hyperflexion (landing from jump, plumbers, wrestlers, etc.), high impact compression loads, MCL or ACL mechanisms.

Acute knee injuries brought on by trauma can be cured with rest, ice therapy, compression, protection and elevation [9]. For a degenerative meniscus rupture, non-surgical treatments like intra-articular injections, quadriceps training, exercise reduction, unloading braces, and anti-inflammatory medications should be tried first [9].

2.3. Achilles tendon rupture

The Achilles tendon forms at the gastrocnemius and the soleus muscle and ends at the calcaneus bone (heel). The stress of basketball on the Achilles tendon is many times greater than the stress we normally experience in life. Violent pulling during basketball leads to overstretching of the superficial gastrocnemius and deep flounder muscles leading to rupture of the Achilles tendon. The Achilles tendon in the lower leg is a tough connective tissue, and the reason for Achilles tendon rupture is mainly due to external forces. In addition to this, in basketball, the Achilles tendon is subjected to additional impact when the basketball player's body collides, due to factors such as excessive movement and speed, which puts a burden on the Achilles tendon.

Physical therapy for an Achilles tear involves immobilization in a cast and wearing a Cam Walker for the first few weeks of the rupture, after which light recovery activities can be performed on the ankle to prevent secondary injury.

2.4. Patellar tendinitis

The ligament that links your patella to your lower leg's fibula is known as the patellar tendon. Long-term basketball activity that involves a lot of hopping or knee-turning puts more strain on the knee joint. Localized strain from prolonged usage of the patellar ligament may result in patellar tendinitis. Basketball players' unstable hip and ankle joints require compensatory adjustments in the patellar tendon region, which increases pressure on the knee joint and over time may result in patellar tendinitis. Patellar tendonitis when the patellar tendon is damaged or inflamed.

The main treatment for patellar tendonitis depends on the extent of the injury sustained. In less severe cases, chronic patellar tendonitis can be treated with physiotherapy. The main means of physical therapy are strengthening of the lower extremity muscle groups and massage modalities. Eccentric movements can speed up the patellar tendon's collagen strands' remodeling process and it has been proven effective among both competitors and non-athlete patients with fantastic outcomes [10]. In cases requiring surgical treatment, post-surgical material therapy interventions are focused on restorative training.

3. Common American football injuries

The adductor muscle strain, the tendon injury and the pelvic instability are the main causes in football injuries. There are many causes of groin injuries. There are different treatments for different causes. For Osteitis Pubis, cortisol injections are a primary treatment for Osteitis Pubis and can help athletes return to play quickly. For Sports Hernia, the conservative approach of physical therapy is not very effective, and surgery is the most common method. For Adductor Strains, as with sports hernia, surgical treatment is the main treatment option.

The mechanism of the shoulder dislocation is due to athletically induced trauma to the humerus and the glenoid caused by external contact and collision during a football game. The acromioclavicular joint connects the acromion of the scapula with the clavicle at its lateral end. The acromioclavicular ligament sprains occur when a football player falls to the ground during a body slam in the middle of a tackle, and one football player is pinned by another football player. The soft tissues of the acromioclavicular ligament are torn. Acromioclavicular joint pain and swelling are typical symptoms for athletes who sustain this injury, as well as difficulty raising the arm above the head. A major deformity might potentially result from the separation of the acromion and clavicle. The Acromioclavicular Joint Sprain / Dislocation is divided into six stages. Each stage corresponds to a different severity of injury. The smallest to the largest of these stages corresponds to increasingly severe injuries. Conservative treatment with physical intervention is limited to the first three stages.

4. Common baseball injuries

4.1. Ulnar collateral ligament injuries

The throwing elbow's repeated valgus force places a lot of strain on this joint. This strain has the potential to harm the ulnar collateral ligament structurally [11]. Non-surgical UCL treatment begins with rest and the use of NSAIDs immediately after the injury to reduce inflammation and pain. After the initial inflammation subsides, physical therapy is started to strengthen the muscles around the elbow and restore range of motion.

4.2. Damage to the rotator cuff in the shoulder

Rotator cuff injuries are mainly due to long-term repetitive throwing movements that cause inflammation of the rotator cuff resulting in pain. Baseball is a throwing sport in general, making it one of the leading causes of shoulder injuries. Rotator cuff tears and posterior shoulder capsule injuries are most frequently brought on by baseball. The stress placed on the posterior shoulder capsule during the late throwing phase, particularly when the "hard throw" is out of control and can result in a little muscle fiber rupture, is the major source of injuries to the region. The front of the shoulder and the humeral tuberosity hurt for the athlete. The recovered region can burst once again if the initial injury is not sufficiently relaxed, and the throwing motion is initiated too soon. This repetitive damage may result in tendinitis, subacromial bursitis, and a roughening of the rotator cuff.

Exclusive reliance on non-surgical treatment (conservative treatment) has been shown to be used in cases where rotator cuff injuries cannot be repaired but should not be used for repairable tears in patients with high intermediate to long-term functional needs [12]. Recovery from operation is the main emphasis of rotator cuff physical therapy. A safety period, a recovery phase, and a return to activities phase are included. Phase one of therapy covers the initial few weeks following operation, when your risk of reinjuring your shoulder is highest. Gentle massages, suggestions for pain management, and the use of methods like icy compression and electrical stimulus are all included in physical therapy. The purpose of phase two is to regain shoulder mobility and intensify activities to strengthen the rotator cuff muscles, which give extra support and stability to your shoulder, as well as the "core" muscles of the trunk and scapula. Hands-on methods can be used in physical rehabilitation to help the arm regain its range of motion. Beyond this is the recovery of joint consciousness and power. The concluding stage aids in the return to competitive athletics. Physical therapy concentrates on exercises for particular tasks to satisfy unique requirements during this stage.

4.3. SLAP tear

The labrum is the cartilage band that surrounds the cavity. The apex of the labrum and glenoid receive the biceps tendon insertion. The labrum widens the shoulder joint's socket and gives it support. Where the biceps tendon enters the glenoid labrum is where SLAP tears develop. A SLAP rupture occurs when overhead movements cause damage to the glenoid labrum at the location where the biceps muscle inserts. The baseball pitching motion in over-the-top motion has extreme abduction and external rotation of the shoulder joint. Repetitive overhead motion exacerbates SLAP tears.

Physical therapy can be used to address SLAP tears by extending the posterior capsule and strengthening the rotator cuff and scapular muscles. One baseball research demonstrates that pitchers who engaged in an internal rotation exercise program for more than three years had higher internal rotation and overall range of motion than pitchers who engaged in the program for fewer years [13].

5. Common tennis injuries

5.1. Epicondylitis of the elbow (tennis elbow)

The most prevalent condition that interferes with the operation of the light is tennis elbow. Tennis players are more likely to get the illness. The radial (lateral) tendons are affected by tennis elbow, namely the radial kyphosis tendon and, to a lesser extent, the radial longissimus tendon. Tennis players

must use their backhand to smash the ball, which increases the impact force on the forearm extensor tendon when it strikes the racket. Over time, this inflammation-causing injury to the tendon will cause discomfort.

Tennis elbow treatment consists of three stages. Several physical interventions have been used in the initial phase, including oral NSAIDs, icing the elbow, splinting, local corticosteroid injections around the tendon attachment points, ultrasound, hyperbaric electrical stimulation, and the use of counterforce braces to help the athlete regain range of motion and stop wearing them whenever necessary [14]. When the competitor returns to the playing field, recovery training is the main emphasis of the second and third stages.

6. Common soccer injuries

6.1. Medial collateral ligament sprain

The most frequent kind of knee ligament damage is to the medial collateral ligament. The medial knee joint becomes painful, swollen, and unstable in addition to having limited range of motion. It is usually caused by strong abduction of the lower leg due to sports, such as kicking the ball with the inside of the foot while playing soccer with excessive force. It is caused when a defender suddenly strikes the outside of the knee joint or the outside of the lower thigh and calf while standing with a strong external force, resulting in valgus force. MCL is related to knee strain from the outside, combined external and external rotational forces on the knee, direct strike to the knee's outer.

Depending on the severity of the injury, MCL sprains are classed into 3 Grade. Physical therapy is basically the same for grade 1 and grade 2 medial knee ligament injuries. Rest when engaging in vigorous exercise, use periodic cold treatment, apply compression, and elevate. Range-of-motion movements, electrical stimulus, and limited weight bearing are all permitted when swelling is under control. Ibuprofen is one example of a nonsteroidal anti-inflammatory medication that may be given [15]. Depending on whether the injury is a sprained medial collateral knee ligament alone or if another ligament has also been injured, grade III medial knee ligament injuries should either be addressed medically or with physical therapy [15].

6.2. Calf strains

Calf strain refers to overstretching the muscle groups on the back of the calf such as the gastrocnemius and flounder muscles. Calf strains are mainly due to excessive strain on the gastrocnemius muscle. The gastrocnemius is an explosive muscle. In soccer, the gastrocnemius muscle is the main force when running at high speed. Calf strain may be caused by uncoordinated force during high-speed movement. Calf muscle strains are classified I–III according to the extent of the muscle fiber rupture. Depending on the grade, different treatments may be used, such as rest, cold, compression, elevation, mild stretching, and massage to reduce swelling and calm the muscle. NSAIDs and opioid painkillers can both be used to decrease inflammation [16].

6.3. Anterior cruciate ligament tear

The femur and tibia are joined by the ACL, a band of thick connective tissue [17]. A rupture or strain of the anterior cruciate ligament is referred to as an ACL injury. Soccer players frequently experience an ACL rupture after changing direction or cutting while decelerating, landing off a leap at or close to full extension, and turning when the knee is nearly fully extended and landing on the ball of the foot [18]. Anterior cruciate ligament reconstruction is the primary treatment for ruptured anterior fork ligaments. Some physical therapy as an adjunct can aid in recovery. Some physical treatments such as bracing, icing the knee, electrical stimulation to activate and restore thigh muscle strength, weight training, etc. are available.

7. Conclusion

This article examines physical therapy for common basketball, soccer, baseball, tennis, and soccer injuries to determine the effectiveness of physical therapy in the rehabilitation of athletic injuries. Much of the current research focuses on the comparison of physical therapy modalities to surgical modalities for common sports injuries. In a study comparing surgical and physical therapy for meniscus tears, no specific differences were found. Physical therapy can have different effects depending on the sport of the injury. Some sports injuries can be treated primarily, while others can only be treated as preoperative interventions, for example, to achieve a certain level of mobility for surgery or for postoperative rehabilitation to maximize joint mobility and prevent atrophy. This means that the use of physiotherapy needs to be justified by the specific circumstances of the sports injury, such as the anatomy of the injured location, and the available experience and availability of physiotherapy. In summary, physiotherapy modalities have a systematic and proven intervention model for common sports physical injuries. This maximizes the likelihood of relatively effective and stable physical interventions and maximum recovery. Physiotherapy and other modalities of treatment such as surgery should complement each other to achieve the best possible outcome.

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