Ankle ligament injuries are also very common among young athletes. The front and middle bands of the lateral ligament are the ligaments commonly injured in a sprain. Recent epidemiology studies have revealed that ankle sprains have a high incidence among athletes, and are particularly common in those who practice team sport. The benefit of using PRFG in ligament injuries is widely studied, over knee and ankle. These studies have shown that the PRGF seems to play an important role during the regeneration of the low healing potential ligament tissue, when applied. It also helps to restore the biomechanical properties of the tissue. It is important to restore the anatomy, recover function and to have a good biological environment so as to avoid degenerative processes in the cartilage joint.

SUMMARY

Ligament injuries have a high incidence among young athletes and they occur most often in contact sports. Treatment of these injuries has a profound impact not only for athletes but also for everyone who engages in recreational sports practice.

Knee injuries are common and potentially career ending in amateur and professional sports. There are two ligaments on the knee cavity, anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL). PCL injuries happen far less often than ACL injuries, because PCL is stronger than ACL and most commonly occurs in combined knee ligament injuries. The other two ligaments in the knee are the lateral collateral ligament (LCL) and the medial collateral ligament (MCL) which are located on both sides of the knee.

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1. INTRODUCTION

Since the emergence of regenerative medicine, a range of studies has demonstrated the efficacy of new biological treatments. During the tissular healing process, angiogenesis, tissular proliferation and extracellular matrix formation occurs. These processes are based on biological events controlled by a series of growth factors and proteins.

Until the emergence of PRGF therapies, it has not been possible to initiate healing in the same therapeutic agent using the necessary cell scaffold and molecular signals.

To understand the complexity of PRGF therapies, knowledge about platelet biology is fundamental. The primary and best-known function of platelets is their contribution to hemostasis. However, more functional facets of the platelets have been identified, and we now know that they play an important role in inflammatory and proliferative events, and also a critical role in tissue remodelling and wound healing; and furthermore, we now recognize their angiogenic power to deliver proteins to areas where tissue is damaged.

For these reasons, PRGF is a good vehicle to deliver GFs to the injured site, where it can mimic the physiological process of tissue repair.

Platelet Rich Growth Factor, PRGF, is a source of autologous Growth factors obtained by different methods. Depending on the system, the products obtained have different chemical and cellular composition, which consequently lead to different results after application. For that reason, it is very important to know the composition of the product administered.

There are studies suggesting that leukocytes in PRGF contribute to inflammatory cytokine production. But even more significant than simply minimizing inflammation is the maximizing platelet role to decrease inflammation and enhance matrix gene synthesis.

Growth Factors are substances whose biochemical signals are capable of modulating the cellular response. These substances can be vitamins or hormones with the main function of stimulating cell growth and differentiation. They are involved in a large number of other very important biological functions such as cellular proliferation, cellular survival, migration and even apoptosis.

Growth factors are cellular mediators synthetized by many different types of cells. The connective tissues are known to contain many of the signalling proteins that play a very important role in the remodelling and repair of the different types of connective tissue.

Growth Factors carry out their function at very low concentration, in the region of pico or nanograms. They bind to a cellular receptor; this receptor is specific for a second messenger where a tyrosine-kinase protein acts. This activation starts the signalling cascade, ending in the nucleus where the transcription factors activate one or more genes.

The most important Growth Factors acting in liga-ment healing are PDGF, TGF-β, IGF, FGF, EGF and VEGF, but also NGF and HGF in a smaller proportion.

The PDGF has mitogenic properties as a very strong mesenchymal cell activator, modulates important processes as endocytosis or cell migration, and also plays a very important role in repair and regeneration processes. TFG-β has many different functions such as proliferation, migration and cell metabolism. It stimulates or inhibits cell differentiation and proliferation depending on its concentration, tissue environment and cell type. The functions of IGF are cellular replication, synthesis of glycogen, proteins and glycosaminoglycan, and the transport of glucose and amino acids throughout the cell membrane. IGF also plays an important role in increasing cartilage, bone formation, and decreasing extracellular matrix degradation. The main FGF biological activity is the mitogenic, chemotactic and angiogenic capacity over many cells. EGF stimulates mitogenesis, increasing DNA, RNA and protein production in fibroblasts and in endothelial cells. VEGF...