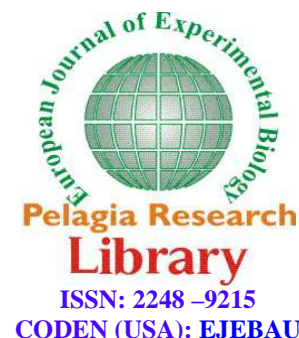




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Effect of platelet-rich plasma, low-level laser therapy (650 nm) or their combination on the healing of Achilles tendon in rabbits: a histopathological study

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ABSTRACT

Tendon repair is still a challenge for rehabilitation. Various treatments for tendon injuries are currently used or have been trialed. This study was established to investigate the effects of low level laser therapy (LLLT) or platelet-rich plasma (PRP) treatment alone or using combined method on the healing of Achilles tendon. Twenty-four male white New Zealand rabbits were divided randomly into four groups of six animals each: GI: partial tenotomy with no treatment, only 1 ml normal saline was injected weekly for 3 weeks consecutive at the site of splitting; GII: partial tenotomy with PRP treatment; GIII: partial tenotomy with LLLT (P= 100 mW, WL= 650 nm, A= 1cm², T= 1min) for 15 consecutive days; GIV: partial tenotomy with LLLT + PRP. Histopathological parameters such as inflammatory reactions, adhesion formation and collagen synthesis were measured. In the present study, the results showed that the treatment of rabbits with PRP or LLLT alone has significant advantages over untreated animals (P<0.05). Furthermore, it was found that the combined treatment with PRP and LLLT is even more efficient than when each of the two treatments is used alone but there was no significant difference (P>0.05) between the two groups of laser and PRP. However, the treatments combining PRP and LLLT showed significant results (P<0.05). Our results demonstrate a decrease in the time of tendon regeneration by using the two therapies combined, accelerating the healing process.

Keywords: Low level laser therapy, Platelet-rich plasma, Achilles tendon, histopathology, Rabbit.

INTRODUCTION

Tendon healing of acute injuries occurs in three stages: inflammation, proliferation and remodeling. During the first stage, fibroblasts migrate to the injured site. In the second one, the proliferative stage, fibroblasts increase in number and synthesize collagen. The last step involves cell and capillary number reduction and collagen fibers realignment [1].