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Short-term changes after corticosteroid injections into the normal tendons of rabbits: a controlled randomized study

Alexandre Leme Godoy-Santos[1], Kandir Genesio Innocenti Dinhane[2], Alexandre Todorovic Fabro[3], Maria Regina Moretto[2], Igor Depra[2], Winston Bonetti Yoshida[2]

1. Instituto de Ortopedia e Traumatologia, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo, São Paulo, SP, Brazil.
2. Universidade Estadual Paulista, Botucatu, SP, Brazil.
3. Universidade de São Paulo, Ribeirão Preto, SP, Brazil.

ABSTRACT

Introduction: Corticosteroid injections in or around tendons for the treatment of athletic injuries are a common practice among orthopedic surgeons and are apparently efficacious in the short term, although controversies persist related to local complications.

Objective: This study evaluated short-term (48 hours) biomechanical, biochemical, and histological alterations after a single injection of betamethasone into the normal tendons of rabbits.

Methods: A total of 72 New Zealand White rabbits were randomly divided into 2 groups: the test group - in which 36 animals underwent 1 intratendinous injection of betamethasone (1.4 mg / 0.2 mL) in the right calcaneal tendon; the control group - in which the right calcaneal tendon of 36 animals was injected with saline (placebo control group) and the left calcaneal tendon was left untreated for normal standards (normal control). Forty-eight hours later, the animals were euthanized and the tendons harvested. Metalloproteinase (MMP1 and MMP2) and interleukin (IL1 and IL6) expression levels, biomechanical resistance (load 3 elongation parameters), and histomorphometry (hematoxylin and eosin and picrosirius red stains for collagen fibers, tenocytes, and inflammatory cells) were analyzed in the tendons.

Results: The test group showed a significant reduction in MMP2 expression compared with the control groups (*P*=.027). Regarding the other parameters, there were no additional significant differences between the groups.

Conclusion: A single injection of corticosteroid into normal calcaneal tendons did not trigger acute local morphological, structural, or biomechanical injuries at 48 hours, but it did promote a significant decrease in MMP2 levels. Additional studies are needed with increased follow-up durations, various doses, and multiple injections and in tendinopathic models.

Keywords: Tendons; Corticosteroids; Histomorphometry.