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Comparative evaluation of the early effects of the low-level laser therapy versus intra-articular steroids on temporomandibular joint acute osteoarthritis in rats: A histochemical, molecular and imaging evaluation.

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Abstract

BACKGROUND: Osteoarthritis (OA) is a serious degenerative **joint** disease. It is one of the main causes of disability in the world. Current treatment modalities have numerous side effects. Subsequently, health experts are looking for alternative therapies.

OBJECTIVES: The aim of the study was to evaluate the early effects of low-level **laser therapy** (LLLT) vs intraarticular (IA) corticosteroids (CS) on acute **temporomandibular joint** osteoarthritis (TMJOA).

MATERIAL AND METHODS: Sixty rats were divided into 3 groups: group 1- untreated OA; group 2 - OA treated with CS; and group 3 - OA treated with LLL. Half of the animals in each group were sacrificed at 1 and 4 weeks post treatment. The **temporomandibular joint** was dissected and evaluated histochemically, using quantitative real-time polymerase chain reaction (qRT-PCR), and radiographically.

RESULTS: Histochemically, Safranin-O staining revealed an obvious reduction in proteoglycans in the untreated osteoarthritic group. However, both of the treated groups showed a moderate increase in glycosaminoglycan (GAG) staining. As for the qRT-PCR results, caspase-3 showed the highest mean value in the untreated OA group, followed by the CS group, while the lowest mean value was recorded in the LLL group. Radiographically, the condyle showed erosion, flattening, osteophyte formation, and sclerosis in the untreated group, but there was great improvement in both of the treated groups.

CONCLUSIONS: Both **laser** and cortisone showed reparative and formative effects, as evidenced

by the increases in the proteoglycan content. However, LLL was superior in its anti-apoptotic effects. Cone beam computed tomography (CBCT) is a valuable tool in assessing osseous abnormalities.

KEYWORDS: caspase-3; glucocorticoids; low-level **laser therapy**; osteoarthritis; **temporomandibular joint**

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