

TITLE: IMPACT OF SUPRA AND SUBPHYSIOLOGIC LEVELS OF TESTOSTERONE AND INHIBITION OF ANDROGEN RECEPTORS IN *PORPHYROMONAS GINGIVALIS*-INDUCED BONE LOSS

AUTHORS: SPOLIDORIO, L.C.; GONÇALVES, V.P.; SPOLIDORIO, D.P.; HUACHO, P.M.; STEFFENS, J.P.; ROSSA JR, C.

INSTITUTION: FACULDADE DE ODONTOLOGIA, UNESP – ARARAQUARA, SP (RUA HUMAITÁ, 1680, CEP 14801-903, ARARAQUARA – SP, BRAZIL)

ABSTRACT:

Testosterone is a sex hormone that exhibits many functions beyond reproduction; one such function is the regulation of bone metabolism. The role played by androgen receptors during testosterone-mediated biological processes associated with bone metabolism is controversial. This study aims to use an experimental model in vivo in order to assess the involvement of supra and subphysiologic level of testosterone and pharmacologic inhibition of androgen receptors in a classic model of *Porphyromonas gingivalis* - induced bone loss. *P. gingivalis* has been associated with subgingival biofilms in chronic and aggressive forms of periodontitis. *P. gingivalis* was injected into the subcutaneous tissues overlying rat calvariae. The impact of hormone deprivation was tested through orchietomy or chemical blockage of androgen receptor using flutamide (FLU). Forty male rats (*Rattus norvegicus* albinos, Holtzman), approximately 2,5 months old, were randomly divided into four experimental groups: G1-Control, G2-Testosterone (250 mg/body weight/week, subcutaneously), G3-Flutamide (50 mg/body weight/two days a week by oral gavage) G4-Orchietomy (OQX). The animals were submitted to different treatments for 15 days. At day 15, 1000 μ L of suspension of *P. gingivalis* 4×10^9 UFC ml^{-1} was injected into the subcutaneous soft tissue over the calvariae of rats for 3 alternate days (15, 17 and 19 days respectively). The animals were euthanized on day 21. Morphological analysis of calvarie was performed using micro-computed tomography (micro-CT). Values were compared among treatment groups using one-way ANOVA and t test with a 95% confidence level ($p < 0.05$). The results showed that the groups treated with testosterone and flutamide presented lower bone resorption compared to the control group ($p < 0.05$), whereas the orchietomized group presented greater bone loss than the other groups treated with hormone and androgen receptor blocker ($p < 0.05$). It can be concluded that hormone has a preventive effect in the bone resorption process, while orchietomy, and consequently, testosterone deficiency, reflects the increase in bone loss.

Keywords: *Porphyromonas gingivalis*, testosterone androgen receptors, bone loss

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