



Dental Implant osseointegration inhibition by nicotine through increasing nAChR, NFATc1 expression, osteoclast numbers, and decreasing osteoblast numbers

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ABSTRACT

The success of dental implants is determined by the osseointegration process. Many studies state that smoking cigarettes can inhibit osseointegration, but the inhibition mechanism is still unclear. The aim of the study was to identify and analyze the effect of nicotine on the inhibition of dental implant osseointegration through the expression of nicotinic acetylcholine receptor (nAChR), nuclear factor of activated T cells cytoplasmic 1 (NFATc1), osteoclast, and osteoblast numbers. This study is an experimental study with a *post-test control group design* to 16 rabbits, randomized across two groups. Group 1 (eight rabbits), was a control group and group 2 (eight rabbits), was a treatment group. The treatment group was given 2.5 mg/kg body weight/day of nicotine by injection 1 week before implant placement of the implantation until the end of the research. Observations were made in the first and the eighth week by measuring the number of osteoclast and osteoblast by histology test, and the expression of nAChR, NFATc1 by immunohistochemistry test. Data was analyzed using a one-way analysis of variance and Student's t-test. A p-value of <0.05 was considered statistically significant. The conclusion of the study was nicotine inhibits the osseointegration of dental implants by increasing nAChR, NFATc1, osteoclast numbers, and decreasing osteoblast numbers.

BIOGRAPHY

Nina Nilawati has completed her PhD at 2013, at the age of 51 years from Airlangga University, Indonesia. She is the Periodontist at Haji General Hospital East Java and also lecturer at Faculty of Dentistry Hang Tuah University, Indonesia.



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