1. No.

FP01812199

2. Title

The Effect of Nicotine on Endochondral Ossification

3. Period

2016-2018

4. Summary

[Background] The purpose of this study is to clarify the influence of stimulus of smoking such as passive smoking on the growth and development of skeleton by examining the effect on smoking on endochondral ossification.

[Methods] Animals: CNP-Tg mice: Transgenic mice expressing CNP under the control of the mouse type II collagen promoter. Tibiae were harvested from wild type mice and CNP-Tg mice at 1 day old and the organ culture was performed using tibiae by adding 3 concentrations of vehicle, nicotine10-7M and nicotine10-5M. Micromass cultures of chondrocytes from rib of wild type mice and CNP-Tg mice at birth were performed with vehicle or 10-7,6 M CNP.

[Results] In the organ culture of tibia collected from wild-type and CNP-Tg mice, growth inhibition was not clearly observed with the addition of nicotine 10-7M but growth suppression was observed with the addition of nicotine 10-5M. In the histological analysis, growth suppression in the growth plate was showed especially in the the hypertrophic layer. In micromass culture experiment using chondrocytes derived from wild-type and CNP-Tg mice, the thickness of micromass with the addition of nicotine 10-6M was thinner than that with the addition of nicotine 10-7M or vehicle.

[Conclusions] High concentrations of nicotine inhibit the endochondral ossification.