

R-16. Effect of green tea polyphenol (-)-epigallocatechin gallate(EGCG) on expression of MMP-2, -9, -13 and osteoclast differentiation *in vitro*

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연구 배경

Alveolar bone resorption is a characteristic feature of periodontal diseases and involves the removal of both the mineral and organic constituents of bone matrix, which is caused by either multinucleated osteoclast cells or matrix metalloproteinases (MMPs). Gram-negative bacterium, *Porphyromonas gingivalis* has been reported to stimulate the activity and expression of several groups of MMP, whereas (-)-epigallocatechin gallate (EGCG), the main constituent of green tea polyphenols, has been reported to have inhibitory effects on the activity and expression of MMPs. In the present study, we investigated the effects of green tea polyphenol EGCG on the gene expression of osteoblast-derived MMP-2, -9, and -13, stimulated by *P.gingivalis*, and the formation of osteoclast.

연구방법 및 재료

The effect of EGCG on the gene expression of MMPs was examined by treating mouse calvarial primary osteoblastic (POB) cells with EGCG (20 M) in the presence of sonicated *P.gingivalis* extracts (SPEs). The transcription levels of MMP-2, -9, and -13 were assessed by reverse transcription-polymerase chain reaction (RT-PCR). The effect of EGCG on osteoclast formation was confirmed by tartrate-resistant acid phosphatase (TRAP) staining in co-culture system of mouse bone marrow cells and calvarial POB cells.

연구결과

Treatment of SPEs stimulated the expression of MMP-9 mRNA and this effect was significantly reduced by EGCG, whereas the transcription levels of MMP-2 and MMP-13 were not affected by SPEs and EGCG. In addition, EGCG significantly inhibited the osteoclast formation in the co-culture system at a concentration of 20 M.

결론

These findings suggest that EGCG may prevent alveolar bone resorption in periodontal diseases by inhibiting the expression of MMP-9 in osteoblasts and the formation of osteoclasts.

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