Systemic treatment with resveratrol and/or curcumin

reduces the progression of experimental periodontitis in rats

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Background and Objective:
Periodontitis is a chronic inflammatory disease of periodontal tissues. **Resveratrol and curcumin**: plant-derived substances that may have immunomodulatory properties. This study investigated the association of resveratrol and curcumin on the progression of experimental periodontitis in rats. Inflammatory cell infiltration occurs in periodontitis and the cells brought into the region include T lymphocytes, macrophages and, most importantly, **polymorphonuclear neutrophils (PMNs).** PMNs secrete proteases and reactive oxygen species which leads to destruction of surrounding tissues. The production of reactive oxygen species leads to recruitment of osteoclasts that resorb the surrounding bone. Targeting these inflammatory cells' activity could lead to more improvement in patients with periodontitis.

Resveratrol (3,4^0 ,5-trihydroxystil- bene)

- Nonflavonoid polyphenol antifungal present in at least 72 plants and also in foods including grapes, cranberries and peanuts
- Found to possess several biological qualities.
    - Improve metabolic control in diabetes, anti-cancer activity.
    - Anti-oxidative properties
    - Neutralizes reactive oxygen species (ROS)
        - Inhibits CYP450 synthesis enzyme responsible for ROS production
- Induces osteoblastogenesis

Curcumin

- From root of Turmeric plant
- Has shown to have anti- carcinogenic, antiviral, antioxidant and anti-inflammatory effects
- Impacts inflammation by decreasing inflammatory infiltrate within the periodontal pocket and stimulating an increase in collagen and fibroblasts.

Combined use of these two agents has been shown to reduce the levels of pro-inflammatory cytokines, and also to lead to increased antioxidant activity, as well as anti-cancer activity.

Hypothesis/purpose of study

- Should down regulate biomarkers of inflammation that are present in periodontitis
- The idea is that when combined, the effects will be additive and synergistic.

Material and methods

- 40 adult male rats
    - group 1 – placebo solution
    - group 2 - 10mg/kg resveratrol
    - group 3 – 100mg/kg curcumin
    - group 4 – both resveratrol and curcumin

Discussion:

- Administration of resveratrol and curcumin, alone or in combination, appeared to enhance the levels of IL- 4
- Resveratrol alone reduced the levels of IFN- c.
- It is noteworthy that although no significant difference was found in the amounts of IL-1b when resveratrol and curcumin were used alone, a trend toward lower levels of IL-1b in these groups was observed when compared with the control group.
- Resveratrol alone showed less alveolar bone loss in experimental periodontitis
- Reductions in the levels of IL-1b, IL-6, IL-8, TNF-a
- When combined, reductions in the levels of IL-1b on both ligated and unligated sides compared with the placebo group
- resveratrol and curcumin did not show to hae synergistic effects on the inhibition of progression of experimentally induced periodontitis.
- Both agents caused significant reduction in inflammation-mediated destruction of periodontal soft tissues and bone loss.