

Effect of Tobacco Smoking on Periodontal Disease

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ABSTRACT

Smoking is considered to be a major risk factor for periodontitis and affects its prevalence, extent and severity of disease. It alters the oral environment as well as host-tissue response, thus altering healing potential of periodontal tissues.

Key words: Smoking, Periodontal disease

INTRODUCTION

Tobacco smoke comprises a gaseous phase and a solid (particulate) phase. Gas phase contains carbon monoxide, ammonia, formaldehyde, hydrogen cyanide and other carcinogens like benzopyrene and dimethylnitrosamine. The particulate phase includes nicotine, tar, benzene and benzopyrene. [1] Carbon monoxide decreases oxygen carrying capacity of Haemoglobin that causes reduction of redox potential which directly promotes growth of anaerobic organisms at inflammatory site. Hydrogen cyanide inhibits enzymes required for oxidative metabolism. [2]

Impact Of Smoking On Gingivitis And Periodontitis

Due to release of catecholamines and vasoconstrictive action of nicotine, smokers experience less bleeding on probing compared to non-smokers. [3-4] Increased pocket depth, rate of attachment loss and bone loss are seen in smokers. [5]

Impact Of Smoking On Inflammatory And Immune Response

Impaired f-actin kinetics of neutrophils leads to its decreased motility and migration towards inflammatory stimuli. Also, cigarette smoke suppress neutrophil NADPH oxidase thus inhibiting

respiratory burst mechanism leading to increase oxidative stress and activation of inflammatory cascade (TNF-alpha, IL-1, IL-6, PGE2) which increases extent and severity of periodontal destruction. Tobacco smoke also increases production of neutrophil derived collagenase, elastase, MMP-1, MMP-8 and decreases levels of MMP inhibitors like TIMPs, alpha-1 antitrypsin and alpha-2 macroglobulin. [6]

Impact Of Smoking On Response To Periodontal Procedures

Nicotine adversely affects fibroblasts functions resulting in reduced production of type 1 collagen and fibronectin. It also inhibits periodontal fibroblasts growth and attachment. [7] Nicotine decreases activity of alkaline phosphatase in osteoblasts which leads to decrease synthesis of bone matrix protein. [8] There are greater chances of membrane and graft exposure in periodontal and bone regenerative procedures in smokers compared to non-smokers. [9-10] Also, it adversely affects osseointegration of dental implants thereby increasing the risk of implant failure. [11]

Smoking Cessation And Periodontal Treatment Outcome

Smoking cessation has beneficial effects on periodontium which may be mediated by shift from more pathogenic to less pathogenic microflora, improvement in gingival microcirculation and host immune response. Non-surgical therapy can have more favourable outcome than surgical therapy provided excellent oral hygiene is achieved. Smoking cessation should precede any surgical intervention. Treatment should be limited to non-surgical therapy with short intervals of follow up visits until smoking is aborted. ^[12]

CONCLUSION

Smoking is known to have adverse clinical outcome for non-surgical as well as surgical and long term success of dental implants. Smoking cessation must be considered as innate part of treatment planning in smoking induced periodontal diseases.

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