

REVIEW ARTICLE

THE ROLE OF TREATING NICOTINE ADDICTION PRIOR TO TREATMENT OF PERIODONTAL DISEASES

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ABSTRACT

Introduction and Objective: Tobacco use is a significant risk factor for oral diseases. Periodontal disease has been known to be associated with tobacco use for over twenty years. Despite that, dentists and particularly periodontist does not include tobacco use cessation as part of their initial treatment in treating periodontal disease or placing implants in patients who use tobacco. The increase in prevalence and severity of periodontitis among smokers cannot be explained by differences in the amount of plaque between smokers and nonsmokers. A possible explanation is that smoking may alter the quality of the flora. Dental professionals also have a crucial role to play in tobacco cessation counseling, particularly for patients with chronic periodontitis. More patients will be affected by periodontitis than will ever be affected by oral cancer. **Methods and Results:** Reviews of literatures were done on a clearly formulated question on the need of smoking cessation intervention to increase positive outcome of treatment on periodontal disease. **Conclusion:** Various epidemiological studies strongly suggest that tobacco use cessation is beneficial to patients following periodontal treatments for a better outcome. *ASEAN Journal of Psychiatry, Vol. 12(1) Jan – June 2011: XX XX.*

Key words: tobacco cessation, periodontal disease, periodontitis, dentist

Introduction

Nicotine is the principle addictive component of tobacco smoke or the act of smoking [1,2]. Nicotine addiction is a chronic, relapsing disorder that may require many attempts at quitting smoking and may even necessitate long-term use of medications [3]. Smoking and smokeless tobacco use is a significant public health problem worldwide. It is the single most important cause of preventable ill-health.

Periodontal disease has been known to be associated with tobacco use for over twenty years. Despite this, dentist and particularly periodontist do not include tobacco use cessation as part of their initial treatment in treating periodontal disease or placing implants in patients who use tobacco.

Of late, smoking has been shown to persist due to the individual's addiction towards nicotine. Some researchers have identified this process as

the result of nicotine acting at the $\alpha 4\beta 2$ receptor [4]. Action at this receptor, in particular those within the limbic system lead to a surge of dopamine resulting in a surge of pleasure feelings [5]. This feeling is learnt and leads to a reinforcing effect of maintaining the addiction, similar process that affects those addicted to heroin and also cocaine [4]. So why do people keep on smoking? Peer pressure appears to be a big contributing factor as is other psychological issues like stress and even depression [6]. The connection of the latter with smoking has yet to be established [7]. Whether smoking causes or exacerbates the condition, whether it make it more likely that the sufferer will smoke or whether there is a common underlying cause has yet to be established⁷. However, abrupt cessation also leads to withdrawals and significant distress, causing the individual to have difficulty stopping despite the difficulties faced [4]. Although no single psychological approach has been found to be superior, psychological intervention contribute significantly to the successful outcome in smoking cessation [8].

Smoking cessation programs are often initiated by the medical practitioners. This same group is also expected to champion its success. Lately, other health professionals have taken the interest including the dentist.

Since early 1970s, dental professionals have become increasingly aware of the damage that smoke and smokeless tobacco caused to tissues in and around the oral cavity. Ranging from mild to life-threatening, the following tobacco-related oral conditions may develop: halitosis, hairy tongue, dental calculus, periodontal disease, acute necrotizing ulcerative gingivitis, abrasion, discoloration of teeth and restorative materials, miscellaneous tissue changes, delayed wound healing, sinusitis, leukoplakia and oral cancer [9]. By assisting patients to quit smoking, the important causative factor for a number of oral conditions can be eliminated, the outcome of dental treatments improves, the number of years and the quality of life are added.

The dental literature is replete with data from numerous studies, all of which conclude that

smoking is a highly significant factor associated with deteriorating periodontal health. Tobacco use increases and complicates treatment risks by compromising the prognosis for periodontal disease [10]. The purpose of this paper is to review the significant of tobacco use cessation as a psychological strategy and as a part of initial treatment in treating periodontal disease or placing implants in patients who use tobacco.

The emphasis in behavioral management for the treatment of periodontal disease has traditionally been placed on plaque control. While there is no reason to reduce our efforts to improve oral hygiene in our patients there is a significant need also to address the issue of tobacco use cessation in the management of periodontitis [11].

Approximately half of periodontitis cases have been attributed to either current or former smoking. Both cigar and cigarette smokers have significantly greater loss of bone height than nonsmokers, and there is a trend for pipe smokers to have more bone loss than nonsmokers [6]. Smokers are four times as likely as non smokers to have periodontitis, have greater attachment loss, greater risk of bone loss and greater calculus deposits [11]. High prevalence of furcation involvement and severity of furcation attachment loss were also found in smokers. Thus, there is a greater experience of tooth loss among smokers. Refractory periodontitis has been shown to occur almost exclusively among current smokers and tobacco use cessation is recommended prior to periodontal treatment [12].

Pathogenesis of smoking-related periodontal destruction

The increase in prevalence and severity of periodontitis in smokers cannot be explained by differences in the amount of plaque between smokers and nonsmokers. A possible explanation is that smoking may alter the quality of the flora. The oxygen tension in the periodontal pocket is lower in smokers, which may favor anaerobic species [11]. Smokers

were 3.1 times more likely to exhibit *Actinobacillus actinomycetemcomitans* infection and 2.3 times more likely to be infected with *Bacteroides forsythus* than former or never smokers [13].

Impact of smoking on host response

There is strong evidence that smoking affects the innate and immune host response. Smoking impairs gingival blood flow, revascularization of bone and soft tissues, which could have a major impact on wound healing, particularly as it relates to regenerative and periodontal and implant therapies [11].

Effectiveness of treatment of chronic periodontitis in smokers and non-smokers.

Heasman et al (2006) observed that the majority of clinical trials show significantly greater reductions in probing depths and bleeding on probing, and significantly greater gain of clinical attachment following non-surgical and surgical treatments in non-smokers compared with smokers [14]. A study by Tonetti et al (1995) concluded that cigarette smoking is associated with reduced healing response after Guided Tissue Regeneration (GTR) treatment although consistently higher plaque levels in smokers will also have influenced outcomes [15]. Treated infra-bony defects are adversely affected smokers compared with non-smokers suggested that smoking adversely affects treatment outcomes [15].

Recommendations and effective strategy for tobacco use cessation

The current recommendations for tobacco use cessation and the primary healthcare team advise the following: (a) to assess the smoking status of our patients at every opportunity, (b) to advise all smokers to stop, (c) to assist those interested in doing so, (d) to offer follow up and (d) to refer to specialist cessation services where necessary [9]. In summary an effective strategy to address tobacco use habits in patients presenting with periodontitis could include: (i) a widely disseminated health promotion campaign

directed at the education of young and adult individuals on the effects of tobacco use, (ii) documentation of smoking histories as a routine in patient's notes, (iii) training of dental professionals in both tobacco use cessation counseling and on the indications and use of Nicotine Replacement Therapy, and (iv) integration of tobacco use cessation advice into general clinical practice [9]. Psychological intervention has also been identified to be as important. Although individual intervention is assumed to be effective, the evidence for psychological intervention for smoking cessation lies with group intervention [16]. For smoking intervention, less is more with minimal intervention like physician advice being equally effective as more intensive interventions [17].

Conclusion

While there is no reason to reduce our efforts to improve oral hygiene in our patients, there is significant need to address the issue of tobacco cessation in the management of periodontitis. The dental profession has a crucial role to play in tobacco cessation counseling, particularly for patients with chronic periodontitis. Very many more patients will be affected by periodontitis than will ever be affected by oral cancer. Data from epidemiological, cross-sectional and case-control studies strongly suggest that tobacco use cessation is beneficial to patients following periodontal treatments for a better outcome.

References

1. Balfour D.J.K. The psychobiology of nicotine dependence. *Eur Respir Rev* 2008; Vol 17(110): 172-181.
2. Lee EW, D'Alonzo GE. Cigarette Smoking, Nicotine Addiction, and Its Pharmacologic Treatment. *Arch. Int. Med.* 1993; Vol 153: 34-48.
3. Kotlyar M., Hatsukami D.K. Managing Nicotine Addiction. *Journal of Dental Education* 2002; Vol 66(9):1061-73.
4. WHO. Neuroscience of Psychoactive Substance Use and Dependence. WHO Library Cataloguing-in-Publication Data. World Health Organization 2004

5. Dani JA, De Biasi M. Cellular mechanism of Nicotine Addiction. Pharmacology, Biochemistry and Behavior, 2001, 70: 439-446
6. McEwan A, Hajek P, McRobbie H, West R. Manual of Smoking Cessation: A Guide For Counsellors and Practitioners. Blackwell Publication Press 2006 Pgs 7-8
7. West R & Jarvis M (in press). Tobacco Smoking and mental Disorders. The Italian Journal of Psychiatry and Behavioural Sciences.
8. Covino and Bottari. Hypnosis, behavioural Therapy and Smoking Cessation. J. Dent Educ. 2001; 65 (4):340
9. Christen AG. Tobacco Cessation, the Dental Profession, and the Role of Dental Education. J Dent Educ. 2001; Vol 65(4): 368-74.
10. Mullally B. Smoking cessation strategies and periodontal disease in young adults. BDJ 2002; Vol 192 (4) :234.
11. Johnson GK, Slach NA. Impact of Tobacco Use on Periodontal Status. J Dent Educ. 2001; Vol 65(4) :313-21.
12. Johnson GK, Hill M. Cigarette smoking and the periodontal patient. J Periodontol. 2004 ;Vol 75 : 196-209.
13. Zambon JJ, Grossi SG, Machtei EE et al. Cigarette smoking increases the risk for subgingival infection with periodontal pathogens. J Periodontol 1996; 67: 1050-4.
14. Heasman L, Stacey F, Preshaw PM et al. The effect of smoking on periodontal treatment response: A review of clinical evidence. J Clin Periodontol. 2006 Apr; 33(4):241-53.
15. Tonetti M S, Pini-Prato G, & Cortellini P. Effect of cigarette smoking on periodontal healing following GTR in infrabony defects. A preliminary retrospective study. Journal of Clinical Periodontology 1995; 22:229-234.
16. Stead LF, Lancaster T. Group behaviour therapy programmes for smoking cessation. Cochrane Database of Systematic Reviews 2005, Issue 2. Art. No.: CD001007. DOI: 10.1002/14651858.CD001007.pub2.
17. Lancaster T, Stead LF. Physician advice for smoking cessation. Cochrane Database of Systematic Reviews 2004, Issue 4. Art. No.: CD000165. DOI: 10.1002/14651858.CD000165.pub2

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