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Consensus Report

Advances in the prevention of periodontitis

Group D Consensus report of the 5th European Workshop in Periodontology

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Primary prevention of periodontal diseases includes educational interventions on periodontal diseases and related risk factors as well as regular self-performed plaque removal and professional mechanical removal of plaque and calculus.

Compelling evidence exists, from epidemiological and experimental studies, that, in the absence of oral hygiene, the supporting dental tissues will become inflamed. Therefore, designing a clinical study to assess the effect of plaque removal on prevention of periodontal diseases without oral hygiene as a negative control is unethical, with the exception of short-term studies. As a result, evaluation of preventive interventions is limited to assessing the effect of differences in the quality of preventive procedures based upon plaque removal either by the patient or the professional. In view of these challenges to prove effectiveness, there is a risk that the role of plaque removal may be underestimated. Other interventions which permit comparison against a true negative control may appear to present with stronger evidence. One example of this could be smoking cessation.

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A Systematic Review of the Effectiveness of self-performed Mechanical Plaque Removal in Adults With Gingivitis Using a Manual Toothbrush (van der Weijden & Hiou 2005)

This systematic review in adults with gingivitis indicated that the quality of self-performed mechanical plaque removal should be improved. Based on studies $\geqslant$6 months of duration, *a single* oral hygiene instruction emphasizing the use of a manual toothbrush in addition to *a single* professional ''oral prophylaxis'' at baseline had a small but significant positive effect on the reduction of gingivitis at the end of the study.

What is the role of self-performed oral hygiene in primary prevention of periodontal diseases?

It is well recognized that gingivitis occurrence can be prevented or at least limited by self-performed mechanical plaque removal. Furthermore, the re-establishment of proper oral hygiene condition may revert the inflammatory gingival condition into a healthy status.

In this respect, oral hygiene education appears an essential strategy in primary prevention of gingivitis.

It has been documented that gingivitis always precedes periodontitis and that persistent gingival inflammation is a key risk-predictor for breakdown of periodontal attachment apparatus.

Therefore, it seems plausible to accept that improved oral hygiene condition leading to gingivitis prevention or reduction is beneficial in preventing the transition from gingivitis to periodontitis. Randomized clinical trials demonstrating that improved personal oral hygiene prevents periodontitis are needed. However, evidence stemming from large cohort longitudinal studies, dealing with populations with different periodontal conditions, including periodontally healthy and gingivitis individuals, demonstrated that high standards of oral hygiene ensure the stability of periodontal support (Hujoel et al. 1998, Axelsson et al. 2004).

Since self-performed and professional mechanical plaque removal are essential to primary prevention of periodontal diseases, what is the role of the patient and the oral health professional?

Role of the patient: To seek education regarding efficient self-performed plaque removal and accept regular check-ups to ensure a high level of oral hygiene.

Role of the oral health care professional: To offer information on periodontal diseases and related risk factors as well as education regarding efficient self-performed plaque removal and needs-related check-ups and provide the appropriate professional intervention.

Who carries the responsibility for primary prevention of periodontal diseases?

Since self-performed mechanical plaque removal is essential for the successful prevention of periodontal diseases, the well-informed patient (or his/her caretaker) has to assume this responsibility.

A Systematic Review of Professional Mechanical Plaque Removal for Prevention of Periodontal Diseases (Needleman et al. 2005)

This systematic review has identified an abundance of studies investigating the effects of professional mechanical plaque removal (PMPR) on periodontal conditions. The majority of studies were published 15 or more years ago. Evidence suggests that in adults, PMPR, particularly if combined with oral hygiene instructions (OHI), may be more effective than no treatment in surrogate measures of periodontal disease prevention including the reduction of dento-gingival plaque, gingival bleeding/inflammation, probing depth and the maintenance of attachment levels. The evidence for a benefit of PMPR + OHI when compared with OHI alone is less clear. In other words, it is unclear whether professionally or patient-performed plaque removal (or a combination) is important to primary or secondary prevention of periodontal diseases. Conflicting evidence exists as to the value of PMPR in secondary prevention of periodontitis. Some studies show a profound benefit on surrogate outcomes but not tooth loss, and others suggest no difference between interventions. More frequent PMPR is associated with lower levels of periodontal disease although the optimal frequency is undetermined. The strength of evidence for these conclusions ranges from weak to moderate due to factors including risk of bias, inconsistent results, lack of appropriate analytical statistics and small sample size.

What is (are) the objective(s) of periodontal diseases (gingivitis and periodontitis) prevention?

As stated in previous workshops (1996 World Workshop in Periodontics), the end point of prevention is the maintenance of a functional dentition without signs of gingival inflammation or loss of attachment.

Based on current knowledge from periodontal epidemiology and clinical research, this would require the continuous and complete removal of the dental biofilm at all sites in the dentition. However, this objective is unattainable in most individuals and populations. Efforts should be made to identify those individuals with risk factors that make them more susceptible to either the onset of periodontal diseases and/or progression of periodontitis. If this can be achieved, resources could be targeted to those individuals at risk of disease.

What is the relative contribution of PMPR and OHI in primary and secondary prevention?

Professional mechanical plaque removal (with or without education in self-performed mechanical plaque removal) appears to be associated with improved periodontal health. However, the contribution of OHI in PMPR procedures in achieving the objectives of prevention is unclear. Therefore, there is a need to identify the relative importance of the components leading to health improvements while continuing to emphasize the importance of both.

Which settings and personnel are appropriate to periodontal health promotion?

Periodontal health promotion is the process of enabling people to increase control over, and to improve, their periodontal health. This means building healthy public policy, creating supportive environments, strengthening community action, developing personal skills and reorienting health services. This provides opportunities for enhancing periodontal health promotion through the use of integrated health teams and policies.

The settings may include the dental practice/clinic, the workplace, the community, schools and colleges. Dental teams are key personnel to several components of health promotion listed above. In particular, developing personal skills could be delivered by trained professionals. Other health promotion personnel (behavioural scientists, physicians, nurses) as well as industry and media may be integral to this concept of periodontal health promotion.

Recommendations

In the systematic review it was difficult to determine what constituted the PMPR and OHI procedures.

Therefore, in future studies in which PMPR procedures are evaluated, it is important for investigators to clearly define what these procedures involve. Specific details of PMPR procedures should include types of instruments used and location of instrumentation. If subgingival instrumentation is to be performed, the extent of instrument insertion should be specified. Furthermore, aspects such as frequency, number and duration of sessions, personnel and adjunctive antimicrobials should be addressed.

In studies in which OHI are to be given, detailed information about materials and methods used for education of the patient in self-performed mechanical plaque removal must be reported. Aspects such as oral hygiene devices and products, details of instructional methods, recommended frequency of application, reinforcement and reevaluation should be addressed.

Potential Impact of Subject-based Risk Factor Control on Periodontitis (Ramseier 2005)

In the present review, it was observed that – next to inadequate oral hygiene – tobacco smoking was the only modifiable subject-based risk factor, the control of which demonstrated a beneficial effect on periodontal conditions. It was suggested, therefore, that smoking cessation is an integral part of preventive measures for periodontitis.

What is the evidence that the control of subject-based modifiable risk factors will influence the periodontal status as well as influence the outcome of preventive measures?

Review of the literature clearly illustrated that there is a need for prospective controlled intervention studies assessing the effects of the control of subject-based risk factors on the periodontal status and the outcome of preventive measures.

Second only to improved oral hygiene, smoking cessation was the only preventive measure studied for which benefits for periodontitis patients could be documented. This was indicated in one prospective longitudinal study of 10 years

duration. It is imperative that the control of other modifiable subject-based risk factors be evaluated in view of their potential preventive effects.

Are there appropriate models that can be used to educate oral health professionals in behaviour-change skills?

Most of the modifiable risk factors may be controlled by interventions for behaviour change using motivational interviewing techniques (Moyers & Rollnick 2002). Given that physically healthy patients visit dental offices on a regular basis, it is reasonable that interventions for risk factor control are carried out by the dental team. The efficacy of a smoking cessation program in dental practice has been demonstrated (Smith et al. 1998). An integrative model of behavioural change was described (Prochaska & DiClemente 1983) and introduced to be used by the dental profession (Ramseier 2003). Studies are needed to validate the efficacy of such interventions.

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