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Periodontal treatment in private dental practice: a case-based survey

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Running Title: Periodontal treatment in private practice

Abstract

Background: This study aimed to assess the management and referral patterns of Victorian general dental practitioners based on periodontal diagnosis.

Methods: Following ethics approval, Victorian general dental practitioners were invited to complete five randomised text-based periodontitis scenario questionnaires. Based on their diagnosis respondents were asked for their management options and asked to specify who would perform these treatments. Respondents were also asked about referral procedures.

Results: One hundred and thirty five dentists attempted the survey. Most were in group practice and based in Melbourne. Twenty-two point five percent of respondents worked in a practice employing a hygienist. The management of periodontal disease was appropriate, and treatment options increased with severity. As severity increased patients were more likely to be referred to a periodontist. Periodontal services referred by general dentists to dental hygienists increased with the number of days the hygienists worked within a practice. Over- and under-

diagnosis did not markedly affect management. The recommendation of antibiotics, mouthwashes and periodontal surgery varied depending on year and school of graduation.

Conclusion: The general dentists that completed survey are managing periodontal conditions appropriately and according to current guidelines.

Keywords: practice-based research, periodontal disease, treatment, general dental practitioner

Introduction

Periodontal diseases are within the top five most prevalent health problems affecting Australians[1]. The National Survey of Adult Oral Health (2004-2006) reported a 22.9% prevalence of moderate or severe periodontal disease within the adult (over 15 years of age) Australian population. Moreover, the prevalence of moderate to severe periodontitis increased with age, and ranged from 2.7% for those aged 15 – 24 to 53.4% for those aged 65 and over[2]. The high prevalence of periodontal disease, ageing population and decreased prevalence of edentulism in Australia would suggest an accompanying increase in the treatment of periodontal diseases by general dental practitioners. However, there are few reports detailing the patterns of therapeutic management of periodontal diseases within Australia.

The primary objective of management is the reduction of the plaque burden and management of aetiological risk factors. Broadly, the initial management of untreated periodontal diseases involves oral hygiene instruction (OHI), motivation of the patient, non-surgical debridement and extraction of hopeless teeth. Adjuncts such as mouthwashes or antibiotics may provide additional benefit. Both the American Academy of Periodontology (AAP) and the European Federation of Periodontology (EFP) recommend gingivitis is managed by removal of plaque and OHI[3,4]. Chronic periodontitis should be managed with OHI, removal of supra- and sub-gingival deposits and control of risk factors[3,5]. Antibiotics should only be used in non-responsive sites or Aggressive Periodontitis (AgP)[3]. Similarly, periodontal surgery

should only be considered after initial or hygiene phase and where deep sites and/or furcation involvement are still present or AgP[3]. Occlusal adjustment may be utilized as occlusal overload can exacerbate existing periodontal disease and may interfere with healing[3].

To address the question of how periodontal disease is currently treated in Australian general dental practices, data on how periodontal diseases are diagnosed and managed within general practice need to be determined. It is therefore important to identify what criteria are used by practitioners to arrive at a periodontal diagnosis, how periodontal patients are triaged among dental hygienists, general dentists and specialists and what periodontal therapies are provided, in addition to the interval between maintenance and recall visits of periodontal patients. The US-based Practitioners Engaged in Applied Research and Learning (PEARL) Network recently surveyed their practitioner members (using randomised case presentations) to assess the degree of diagnostic accuracy in periodontal cases and reported that there was wide variation in diagnosis between PEARL practitioners that may affect treatment outcome[6]. This paper reports on a similar study conducted through eviDent, an Australian practice-based research network, which aims to describe the diagnoses and the types of treatment used in managing different severity of periodontal disease by Victorian general dental practitioners and how the management options compared to PEARL practitioners. The diagnostic comparison was published recently[7].

Materials and methods

The project was designed as an online, cross-sectional survey using randomised case presentations. The questionnaire was based on a similar survey conducted by the PEARL dental practice-based network in the US[6]. This project was conducted through the eviDent Foundation, an Australian dental practice-based research network (an initiative of the Australian Dental Association Victorian Branch (ADAVB) and the Oral Health Cooperative Research Centre) that facilitates practice-based research by supporting the relationship between dental practitioners and academic researchers. The project obtained ethical approval from the University of Melbourne.

Participants

The questionnaire was available to all members of the ADAVB who were general dentists (approximately 2500 dentists at the time of the survey); specialist practitioners were not eligible to participate. The questionnaire was hosted in the "Members Only" section of the ADAVB website and promoted via emails, the ADAVB Newsletter, the Australian Society of Periodontology and at relevant continuing professional development events. All responses were anonymous. Options for responses within the survey were generally provided in the form of drop down menus with the occasional free text field.

Survey

On logging into the survey, dentists were first presented with a plain language statement explaining the study and then asked a series of questions to help determine: the type and location of practice, years in practice, number of practitioners, whether a hygienist was employed at the practice, location of undergraduate training and any post graduate training including recent continuing dental education in periodontics.

The dentist was then shown one of three clinical presentations. Clinical presentation A described a new 45 year-old patient with no periodontal attachment loss; clinical presentation B described a new 45 year-old patient with a history of mandibular tooth loss due to looseness; clinical presentation C described a long-time patient in their

practice treated for several years by their referring periodontist who has returned to see them after a two year gap. Each clinical presentation was followed by a more specific clinical scenario. Clinical presentation A preceded scenarios 1 to 4, clinical presentation B preceded scenarios 5 to 8 and clinical presentation C preceded scenarios 9 and 10. The clinical scenarios were text based and corresponded to periodontal health/gingivitis (scenarios 1 and 2), mild periodontitis (scenarios 3 and 4), moderate periodontitis (scenarios 5, 6 and 7), severe periodontitis (scenario 8) and recurrent periodontitis occurring at both single and multiple sites which were also classified as severe periodontitis (scenarios 9 and 10).

The criteria used as a basis for the scenarios (see Table 1) were developed by the PEARL network using the currently available literature in consultation with periodontists and was reviewed by their Protocol Review Committee[6]. The AAP position paper[8] and parameters of care papers[3,5] for chronic periodontal disease were not solely used to develop the scenarios as they do not always distinguish between mild and moderate disease.

Each clinical scenario included information regarding probing depths (PD), bleeding on probing (BOP), clinical attachment loss (CAL), inflammation, bone loss, furcation involvement or mobility. In all, participating dentists were presented with five randomly allocated clinical scenarios (and their associated clinical presentations) from a total of ten. A flowchart outlining the delivery of the presentations, scenarios and questions to the practitioners is given in Figure 1.

A periodontal diagnosis was then requested based upon the results of the periodontal and radiographic examinations presented in the clinical scenario. The available options for diagnosis were periodontal health, gingivitis, mild periodontitis, moderate periodontitis and severe periodontitis.

Based on their diagnosis, the dentist was asked what treatment(s) would be performed in their practice. A flowchart outlining the types of treatment modalities offered for each diagnosis is given in Figure 2. The dentist was also asked to whom this treatment option would be delegated to: general dentist, dental hygienist and/or

periodontist. Dentists were then asked about time intervals between recall/maintenance and influencing factors.

This cycle was repeated a maximum of five times so that each participant answered questions about a maximum of 5 out of the 10 scenarios.

The paper presents descriptive statistics including frequencies and percentages of categorical variables. Possible associations between categorical variables were examined with Chi-squared tests.

Results

One hundred and thirty-five dentists started the survey out of a possible 2500, a response rate of 5.4%. Of these, 106 went on to complete at least one clinical scenario. There were between 85 and 106 respondents for each of the five rounds of case presentations with between 36 and 53 respondents per clinical scenario.

The characteristics of the responders were presented by Bailey et al.[7]. In brief, the majority of responders were within a group general practice (58.5%). Whilst most responders were Melbourne-based, 20.7% were based in either regional or rural locations. Few respondents had completed further formal advanced training (13.3%). However, the majority of respondents (64.4%) reported having completed between one and eight hours of periodontally-related continuing professional development. Nearly one quarter of respondents (22.2%) worked in a practice that employed a hygienist. In those practices that employed a hygienist, the majority employed a hygienist for 4 or 5 days a week. Just over half of respondents (56.3%) received their dental degree from the University of Melbourne.

Table 2 describes the treatment recommendations that dentists prescribed based on the diagnosis they assigned to one of the clinical scenarios, and also indicates by whom the treatment modality was expected to be performed. As severity increased, so did the range of treatment modalities offered such as periodontal surgery, occlusal adjustment, mouthrinses and antibiotics. In regards to maintenance and recall practices, practitioners tended to assign shorter recall intervals in cases of more severe periodontal disease. As the severity of disease increased, there was an increase in multi-disciplinary maintenance care involving both general dentists and periodontists.

No significant associations were found among demographic factors and management options. However, there were a number of trends. Surgery was less likely to be recommended in moderate/severe periodontitis by rural practitioners. More recent graduates, since 2000 or less than 10 years qualified, were more likely to recommend a mouthwash to their patients regardless of severity. Melbourne University graduates were less likely to recommend mouthwashes, occlusal

adjustment and antibiotics overall, but more likely to suggest periodontal surgery in severe periodontitis.

Over- or under-diagnosis did not significantly affect the types of treatment provided. However, there was a trend for decreased use of mouthwashes and root planing across all disease severities when over-diagnosed.

Regardless of diagnosis, respondents working in practices employing hygienists were less likely to offer periodontal services compared to practices not employing hygienists (Figure 3). There was a tendency to refer patients to the hygienist for management. Practices employing hygienists were more likely to recommend root planing to treat mild or moderate periodontitis.

Discussion

This study examined the management protocol of periodontitis by Victorian general dentists , the appropriateness of the respondent's treatment recommendations according to established guidelines, and factors potentially influencing treatment. The results show that the respondents are managing periodontal diseases appropriately and in accordance with current guidelines. Current periodontal guidelines support the management and treatment of patients with mild, moderate and severe periodontal disease with oral hygiene instruction, scaling and root debridement. The use of adjunctive treatment such as occlusal adjustment can be utilised in cases where it is deemed necessary, as studies have shown combined periodontal and occlusal treatment results in greater attachment gain[9, 10]. As shown in Table 2, 8.9% to 19.8% of respondents recommended occlusal adjustment for the management of periodontitis. The use of surgery was only considered a treatment option for cases of severe periodontitis where initial phase therapy had been unsuccessful. The use of antibiotics for the treatment of chronic periodontitis is not supported by the guidelines[11]. International guidelines suggest that maintenance and recall intervals should be individualized to each patient's disease level, risk factors and treatment needs. It is recommended patients with gingivitis have maintenance visits 6-monthly while patients with periodontitis 3-monthly visits[11, 12]. The results of this study show that the respondents are following these recall recommendations.

Interestingly, demographics did not significantly impact ~~in~~ treatment recommendations for gingivitis and periodontitis, although there were a number of trends that were noted. Surgery was less likely to be recommended in moderate/severe periodontitis by rural practitioners, which may reflect the difficulty in referring patients to a periodontist. That Melbourne graduates recommend mouthwashes, occlusal adjustment and antibiotics less often may reflect the differing opinions in the effectiveness of these in the literature, the teaching at an undergraduate/graduate level and articles published by school staff about mouthwashes containing essential oils. The increased use of surgery in severe periodontitis by Melbourne graduates also reflects the curriculum, and may reflect that most Melbourne graduates remain in practice around Melbourne.

Over- or under-diagnosis was not shown to statistically result in over- or under-treatment of periodontal disease. In the diagnosis part of this study, Bailey et al. showed that moderate periodontitis was likely to be over diagnosed as severe and it is possible as a result that too much treatment would have been provided[7]. This appears not to be the case. It could be argued that it is difficult to over-treat periodontal disease with scaling and root planing as any or all pockets will be debrided. Under-diagnosis would perhaps have resulted in insufficient treatment being provided, but in this current study this appears not to be so. However, there was a trend for decreased use of mouthwashes and root planing across all disease severities when over-diagnosed, which can't be readily explained.

In the current study, there was no significant difference between treatment choices recommended by dentists working in practices employing hygienists and practices not employing hygienists. This suggests that the presence of a hygienist in practice does not affect the dentist's treatment decisions for any particular diagnosis. However, it does affect the profile of the practitioner's treatment in that when a hygienist was employed the dentist was less likely to undertake periodontal treatment. It appears that the hygienist is utilized to manage periodontal diseases in these practices. The more days the dental hygienist worked in the practice the more likely respondents would delegate periodontal services to hygienists rather than undertake treatment themselves. This may increase practice productivity and allow more time for dentists to carry out more complex treatment.

Despite the high prevalence of periodontitis in the Australian population, there are few reports regarding the management protocol of periodontal disease by Australian general dental practitioners. A previous study by the American-based PEARL Network found that variation in periodontal diagnoses impacted treatment planning[6]. Unlike the PEARL study, our results did not show a statistically significant difference in the treatments provided in various periodontal diagnoses. Differences between American practitioners and the respondents may reflect variations in dental education across continents and differing consensus by the relevant national/international bodies on appropriate management of periodontal diseases.

The survey design, although modified from a protocol used successfully in a previous study, had some limitations. It was hosted through the ADAVB website via their "Members only" section, and this may have limited the number of potential participants. Additionally, some practitioners who started the survey did not complete all five scenarios, perhaps indicating that some found the survey either arduous or time-consuming or both, suggesting that the survey instrument used could benefit from further streamlining. There was likely to have been some selection bias. Of the two and a half thousand dentists eligible to participate, only 135 attempted the survey. It is possible that these dentists participated because of a pre-existing interest in periodontal disease. The number of reported CPD hours related to periodontal disease (with the majority of practitioners reporting undertaking between one and eight hours) would tend to support this. The low response and selection bias may mean that the results are not representative of all the general dental practitioners in Victoria and this needs to be borne in mind when extrapolating these results.

In regards to the questionnaire, only specific treatment options were available for each diagnosis, which may have guided participants to appropriate treatment modalities for a given diagnosis. The use of open-ended responses would allow participants to more adequately describe treatment modalities and would account for phases of a treatment plan. For instance, periodontal surgery might only be considered following failed attempts of non-surgical debridement at sites that show non-healing. The delegation of tasks to a hygienist was not a self-reported measure

but instead a hypothetical response about what dentists would ask hygienists to do. A more accurate depiction of current dental practice would require dentists to report the tasks that hygienists are actually completing.

Conclusion

The Victorian dentists who took part in this study are using the appropriate clinical treatments to manage periodontal diseases. The majority of the respondents follow recommended treatment guidelines for a given diagnosis, although there were some variations related to place of practice, year and University of graduation.

Acknowledgement

This project was conducted through the eviDent Foundation. eviDent is an Australian dental practice-based research network (an initiative of the Australian Dental Association Victorian Branch (ADAVB) and the Oral Health Cooperative Research Centre) and facilitates practice-based research by supporting the relationship between dental practitioners and academic researchers. Thanks are extended to the PEARL Network for kindly sharing their protocol and materials. The statistical analysis of the data by DDS3 students, Michelle Wong, Michelle Wijendran, Jessica Woods, Cheryl Whitecross, Yinan Wu & Sze Wey is gratefully acknowledged. Thanks also to Karen Escobar, Wendy Thomson, Meaghan Quinn and Eric Mourant. This study was generously supported by funding from the Australian Society of Periodontology, Victorian Branch.

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Table 1. Criteria for Randomised Case Presentation (7)

Case Type	Definition
No periodontitis	None of the following criteria are met
Mild*	≥1 teeth with ≥3 mm PD or ≥1 posterior teeth with grade I

periodontitis	furcation involvement
Moderate periodontitis	≥1 teeth with PD ≥5 mm or ≥2 teeth having PD ≥4 mm or ≥ 1 posterior teeth with grade I furcation involvement and accompanied with PD ≥3 mm
Advanced* periodontitis	≥2 teeth having PD ≥5 mm or ≥4 teeth having PD ≥4 mm or ≥1 posterior teeth with grade II furcation involvement

* 'Mild' synonymous with 'slight' and 'advanced' synonymous with 'severe'.

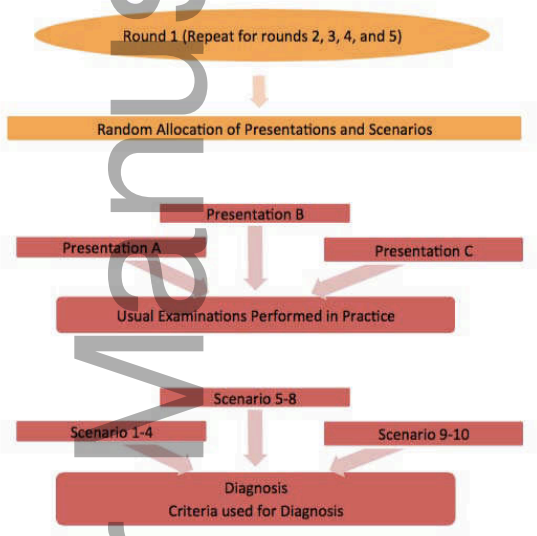

Figure 1. Flow chart of survey presentation

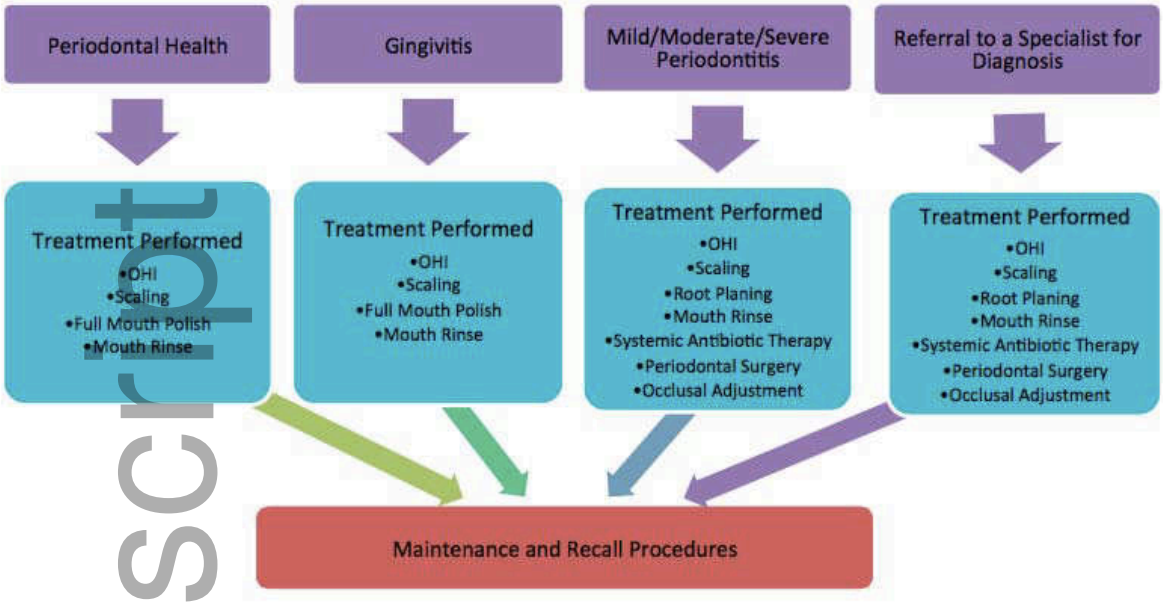

Figure 2. Flow chart of treatment options for each diagnosis (periodontal health, gingivitis, periodontitis, referral to a specialist for diagnosis)

Table 2. Treatment recommendations by diagnosis and clinician. NA indicates that this option was not offered in the scenario.

Treatment Recommendation	**Health (n=51)**	**Gingivitis (n=45)**	**Mild Periodontitis (n=102)**	**Moderate Periodontitis (n=113)**	**Severe Periodontitis (n=98)**
Oral Health Instruction	33 (64.7%)	42 (93.3%)	101 (99%)	111 (98.2%)	93 (94.9%)
By dentist	31 (86%)	40 (80%)	92 (80%)	103 (66%)	84 (59.2%)
By dental hygienist	4 (11%)	9 (18%)	20 (17.4%)	23 (14.7%)	19 (13.4%)
By other care provider	1 (3%)	1 (2%)	N/A	N/A	N/A

By periodontist	N/A	N/A	3 (2.6%)	30 (19.2%)	39 (27.5%)
Scaling	46 (90.1%)	44 (97.8%)	100 (98%)	110 (97.3%)	92 (93.8%)
By dentist	42 (85.8%)	42 (85.7%)	89 (80.2%)	98 (64.5%)	77 (57.0%)
By dental hygienist	7 (14.2%)	7 (14.3%)	20 (18%)	20 (13.1%)	15 (11.1%)
By other care provider	0	0	N/A	N/A	N/A
By periodontist	N/A	N/A	2 (4.2%)	34 (22.4%)	43 (31.9%)
Full Mouth Polish (Prophylaxis)	49 (96%)	43 (95.6%)	N/A	N/A	N/A
By dentist	44 (84.6%)	41 (85.4%)	N/A	N/A	N/A
By dental hygienist	8 (15.4%)	7 (14.6%)	N/A	N/A	N/A
By other care provider	0	0	N/A	N/A	N/A
Mouthrinses	6 (7.8%)	13 (28.9%)	38 (37.3%)	61 (53.9%)	62 (63.2%)
Root planing	N/A	N/A	85 (83%)	102 (90.2%)	88 (89.8%)
By dentist	N/A	N/A	73 (76%)	86 (61.4%)	63 (48.5%)
By dental hygienist	N/A	N/A	19 (19.8%)	18 (12.9%)	15 (11.5%)

By periodontist	N/A	N/A	4 (4.2%)	36 (25.7%)	52 (40%)
Antibiotics	N/A 1 (2%)	N/A	1 (1%)	9 (8%)	22 (22.4%)
Periodontal Surgery	N/A	N/A	3 (2.9%)	9 (8%)	33 (33.7%)
By dentist	N/A	N/A	1 (33.3%)	0	1 (3%)
By periodontist	N/A	N/A	2 (66.6%)	9 (100%)	32 (97%)
Occlusal Adjustment	N/A	N/A	8 (8.2%)	15 (13.3%)	19 (19.4%)
By dentist	N/A	N/A	7 (87.5%)	9 (47.4%)	10 (40%)
By periodontist	N/A	N/A	0	10 (52.6%)	15 (60%)

Figure 3 Percentage of periodontal services provided by dentists at practices with or without hygienists.