Compliance in a Norwegian Periodontal Practice

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Purpose: Patients' compliance with periodontal maintenance therapy is important for the treatment outcomes, however, most studies report compliance rates ranging from only 11% – 45%. The aims of this study were to report on the acceptance of proposed treatment and the long-term compliance of patients treated in a specialist periodontal office in Norway. This was part of an internal quality control measure for this practice.

Materials and Methods: 152 consecutive patients who completed periodontal therapy in 1988 were retrospectively assessed after 10 years. In addition, the case records of 624 consecutive patients referred for periodontal assessment between 1989 and 1993 were examined to determine how many decided to accept the proposed therapy.

Results: The majority 132 (87%) of those who completed treatment in 1988 had attended for the prescribed maintenance therapy over a ten-year period. It was not possible to detect any differences between the compliers and non-compliers in terms of age, gender, severity of disease, cost and national insurance coverage. The 152 patients were originally referred by 18 general dental practitioners. The 'high referring' dentists (>8 referrals) had significantly more non-complying patients than dentists who made less than 7 referrals. 20 (3%) of the 624 periodontal referrals over a 5-year period chose not to proceed with the proposed therapy.

Conclusion: There was a high level of patient compliance in the population group studied in this specialist periodontal practice. Geographic and cultural factors as well as a stable rural population may be important factors in the high level of compliance with maintenance therapy in this practice. The referring general dental practitioners may also play an important role in patient compliance.

Key words: periodontal maintenance, patient compliance, acceptance of therapy, specialist periodontal practice

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Periodontal therapy is successful in maintaining the health and status of the teeth. Numerous surgical and non-surgical techniques have been developed for the treatment of periodontal diseases. Elimination of supra- and subgingival bacterial deposits have been shown to resolve inflammation and arrest disease progression.

Several studies (Ramfjord et al, 1973; Nyman et al, 1975; Rosling et al, 1976; Polson and Heijl, 1978; Knowles et al, 1979; Nyman and Lindhe, 1979; Axelsson and Lindhe, 1981) have demonstrated that patients who followed a maintenance program involving regular repeated prophylaxis after the end of active treatment did not experience recurrence of disease. These findings have been reinforced by other studies which showed that periodontal treatment was of doubtful value to those who did not comply with maintenance therapy (Beck-

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er et al, 1984; Kocher et al, 2001). (Nyman et al., 1977; Nyman et al., 1975; Rosling et al., 1976)

There is evidence that compliance with maintenance therapy is often not optimal. Wilson et al, (1984) reported that only 16% of patients who completed periodontal therapy in private practice complied with recommended maintenance schedules; 49% were erratic compliers and 34% never returned for maintenance therapy. Mendoza et al, (1991) found that only 36% of patients who were treated in private practice were still attending after 7 years. Wilson, (1991) in a review article reported that rates of compliance were only between 11% and 45% in long-term studies in academic institutions for patients who had completed periodontal therapy.

It has been suggested that non-compliance with recommended health care practices represents indirect self-destructive behavior (Farberow, 1986). The behavior of non-complying patients is characterized by denial and the adoption of negligent attitudes towards their illness. The non-compliers seem to want the dental profession to take responsibility for and treat their problems with minimal self-participation. Another study relevant to non-compliance (Oppenheim et al, 1979) indicated that the average dental practice has a 50% turnover in patients every 5 years. It has suggested that approximately half of the turnover could be attributed to lack of satisfaction by the patients. Other factors which have been blamed for non-compliance with dental health recommendations include fear of dental treatment, cost and socio-economic status (Friedson and Feldman, 1958; Gatchel et al, 1983; Rizzardo et al, 1991). Age, gender, type of periodontal therapy, cultural and geographic differences have also been shown to be factors which affect compliance with maintenance therapy (Demetriou et al, 1995; Novaes et al, 1999).

Pre-treatment apprehension and anxiety levels were high in patients referred to a specialist practice for periodontal therapy (Fardal et al, 2001). It was suggested that input from such pre-treatment assessments of patients could be useful in designing individual treatment plans that would include maintenance programmes. A further study demonstrated that it was possible to perform periodontal therapy in the practice setting with low levels of discomfort for the majority of patients (Fardal et al, 2002). Theoretically, this should reassure patients and help to improve compliance with prescribed maintenance schedules.

The main aims of this study were to assess the level of patients' acceptance of proposed periodontal therapy and compliance with maintenance therapy in a specialist periodontal practice as part of an internal quality control measure. The relationship of compliance with various factors such as age, gender, the patients' fees, the National Health insurance contributions, the severity of disease and the referring dentists was also investigated.

MATERIALS AND METHODS

152 consecutive patients who had completed periodontal therapy in a specialist periodontal practice in Norway in 1988 were studied retrospectively. The study formed part of a quality control measure for the Norwegian Department of Health, which was adapted for this practice. Periodontal therapy was completed following a standard accepted sequence of examination, diagnosis, hygiene phase, surgical corrections where required, and placement on a maintenance program.

The treatment regimen was structured so that each patient received the following:

1. Pre-treatment assessment by the clinician to determine anxiety levels, periodontal knowledge and expectation of treatment outcomes.
2. A pre-treatment explanation by the clinician of periodontal anatomy, the disease process, and possible sequelae.
3. A specific case presentation during which the planned periodontal treatment was outlined with emphasis on the importance of maintenance therapy.
4. A discussion of the cost of the therapy, possible insurance cover and various payment plans.
5. Non surgical/surgical periodontal treatment as required.
6. Relatively short (25–30 min.) maintenance appointments.
7. Coordinated and alternating maintenance appointments with the referring dentist.
8. Active feedback to patients during maintenance therapy.
9. Feedback to the referring dentist, when required, during maintenance therapy regarding any restorative or prosthetic work needed or any changes in the periodontal condition that required attention by the periodontist.
10. A continuous reassessment of the frequency of maintenance care visits and adjustment according to the needs of each individual patient.

Table 1 Age, fee and National Health contribution of compliant and non-compliant patients

	Compliant mean (SD) N=132	Non-compliant mean (SD) n=20	t	P
Age	56.7 (10.3)	60.3 (11.6)	1.44	.15
Fee	3702.8 (1174.5)	3584.7 (1242.2)	.42	.67
National health fee	773.4 (229.1)	710.4 (175.8)	1.17	.24

A case diagnosis based on loss of periodontal attachment was determined for each patient. Probing depths were measured at 6 locations around each tooth, (mesiobuccal, buccal, distobuccal, mesiolingual, lingual and distolingual). Periapical and bitewing radiographs were recorded. Patients with generalized moderate pocket depths (4–6 mm) and with generalized radiographic proximal bone loss not exceeding 1/3 of normal bone height were given the diagnosis of mild periodontitis. Patients with a mixture of moderate (4–6 mm) and deep (≥7 mm) pocket depths and with generalized radiographic proximal bone loss of between 1/3 and 2/3 of normal bone height were given the diagnosis of moderate periodontitis.

Patients with generalized deep pocket depths (≥7 mm) and with proximal bone loss > 2/3 of normal bone height were diagnosed as severe periodontitis.

The charts of all patients who completed periodontal therapy in 1988 were examined 10 years later to determine which patients had complied with the prescribed maintenance programs. Changes to appointments to fit in with visits to their own dentists or short term rescheduling of visits for various personal reasons did not exclude the patients as compliant. Patients who had shown erratic compliance (i.e. not 100% compliant) were recorded as non-compliant patients. During the period of study, 2 patients moved out of the area and therefore could not attend, and 2 patients died. These patients were not included in the study.

The charts of all 624 patients who were referred for periodontal therapy to the same periodontal office between 1989 and 1993 were examined and the number of patients who chose not to accept the proposed therapy in full was recorded.

Statistical Analysis

The student t-test was used to compare the compliant versus the non-compliant groups in terms of age, fees paid and the National Health contribution that they received. Chi-square analysis was used and odds ratios and confidence intervals calculated where appropriate.

RESULTS

The study was conducted on 152 subjects who at the census date in 1998 were on average 57.1 (SD 10.5) years of age, range 30–84 yrs. There were 55 (36%) males and 97 (64%) females. The mean fee in NOK was 3,687.2 (SD 1180), range 504–6,420. The National Health fee contribution mean was NOK 765.1 (SD 223), range 79–1,346.

The majority 132 (87%) of the 152 subjects enrolled in the study complied fully with the maintenance schedule. During the 10-year period, 4 of the 20 non-complying patients returned or were re-referred by their dentist for re-treatment of their periodontal disease or for further maintenance care.

There were no statistically significant differences between the compliant and non-compliant groups in terms of age, fee or National Health fee contribution (Table 1). In terms of initial diagnosis, 8 (40%) of the non-compliant group were diagnosed with moderate and 12 (60%) with severe periodontitis. In the compliant group a higher proportion 81 (61%) had moderate periodontitis and 51 (39%) had severe periodontitis. This difference was not statistically significant (χ^2=3.3, p=0.07).

The number of patients studied were referred by 18 general dentists. Most of the non-compliers

Table 2 The relationship between the referring dentists, the numbers of patients referred and non-compliant patients

Dentist	No. of patients referred	Non-compliance	% non-compliance
1	22	3	15
1	19	0	0
1	18	5	28
1	17	4	23
1	14	3	21
1	8	3	38
1	7	1	14
3	5	0	0
8	4	1	3

were referred by dentists with higher number of referrals of 8 or more (Table 2). A non-compliant patient was significantly more likely to be from a dentist with a high referral rate (χ^2=6.55, p=0.01). The odds ratio for a non-compliant patient to be from a high referring dentist was 5.3 (confidence interval 1.3 to 26.3) (Table 3).

Of the 624 consecutive patients referred for periodontal therapy between 1989 and 1993 only 20 (3.2%) chose not to accept the proposed periodontal treatment plan. The remaining 604 (96.8%) of the patients accepted and completed the proposed periodontal treatment plans.

DISCUSSION

This study shows that it was possible to maintain a high level of compliance with periodontal maintenance over a 10-year period in a specialist periodontal practice in Norway. The reasons for the high level of compliance are not entirely clear, as there were no marked differences between the measures emphasized in this study compared with those described in comparable studies that reported much lower levels of compliances. Wilson (1996) made a number of suggestions aimed at improving compliance. These included simplification of required behavior, accommodating patient needs, reminding patients of appointments, keeping records of compliance to avoid patients getting lost in the system, giving thorough information to each patient, providing positive reinforcement, identifying potential non-compliers, and ensuring the involvement of both the referring dentist and the periodontist. Although Wilson (1996) published these guidelines several years after the present study was initiated it is clear that most of the suggestions were adhered to. The need to ensure the involvement of the periodontist was particularly pertinent as the periodontal practice in which the research took place was only established a few years prior to the start of the study. In building the practice the periodontist was closely involved in all aspects of patient care.

A previous study (Fardal et al, 2002) in a specialist practice setting reported that the majority of patients experienced low levels of discomfort during and after periodontal therapy. Virtually all (97%) of patients rated the discomfort associated with periodontal therapy as being equal to or less than that associated with conventional dental therapy such as fillings or crown preparation (Fardal et al, 2002). If the positive assessment of the delivery of treatment contributed to a reduction in patient anxiety this may partly explain the high compliance rates reported in the present study, as dental fear has been reported to be responsible for patient dropout (Friedson and Feldman, 1958; Gatchel et al, 1983; Rizzardo et al, 1991).

Geographic and cultural differences may also account for differences in the level of compliance between this and comparable studies. Novaes et al, (1999) reported substantial variation in the behavior of patients from different practices situated in 4 countries in South America. They suggested that studies on compliance could not be generalized because of differences in culture, economic conditions, knowledge of oral hygiene and the treatment philosophies of dentists (Novaes et al, 1999). The present study reports outcomes from a specialist practice in rural Norway. It is possible that the patient population tended to remain stable in the area compared with the more mobile populations in urban areas. As many of the comparable studies were based either in universities or in specialist practices in larger urban centers, population mobility could account for some of the differences reported. In addition, most of the patients in the current study were from similar cultural and socio-economic backgrounds and this could also play a part in the high compliance rate reported. This population group was ready to accept treatment as only 3% of referrals over a 4-year period refused the periodontal treatment that was prescribed. It is likely that

Table 3 Dentists with a high and low referral rate by compliance of patients

	Compliant	Non-compliant	Total
High referring dentists (≥ 8 referrals) n=6	80	18	98
Low referring dentists (≤7 referral) n=12	52	2	54
Total	132	20	152

the referring dentists spent considerable time and effort motivating some of these patients to accept specialist therapy. It is therefore important to obtain a high acceptance rate to support the general dental practitioners in their efforts to maintain periodontal health for their patients.

There were no differences between the compliant and non-compliant groups in terms of age, fees paid or National Health contributions. This is in contrast to the study of Demetriou et al, (1995) who found that younger patients had a significantly lower tendency to dropout of maintenance therapy. In addition, they also reported a lower dropout rate in females, patients from socio-economic class I and patients who had received non-surgical therapy. However, Demetriou et al, (1995) only reported a compliance rate of 27% after 14 years of follow-up. Novaes et al, (1999) also reported that gender, age and type of therapy were significant independent risk factors for non-compliance. They suggested that males, those under the age of 40 years, and those who underwent non-surgical therapy were the most likely not to comply with supportive periodontal therapy.

In the present study, the compliant group was diagnosed with less severe periodontitis than the non-compliant group. It is interesting to note that 4 of the 20 non-compliant patients did return during the 10-year observation period requesting to be included into the full maintenance program again. The feedback from these patients indicated that their own general dental practitioners were at least partly responsible for this change. The patients and their general dental practitioners favored the sharing of the maintenance therapy between the specialist and general practices.

There was considerable variation in the number of patients referred by each general dental practitioner. This agrees with previous studies of specialist referral in Northern Ireland and Northwest England (Linden, 1998; Linden et al, 1999). Although the present study was limited in size there was some support for the view that the patients from dentists with the highest referral rates were more likely to be non-compliant. Perhaps the dentists with high referral rates were less rigorous in selecting whom to refer. It may be important to discuss with general dental practitioners not only when to refer patients for specialist therapy but also to highlight the extreme importance of compliance with maintenance therapy.

It is suggested that reports of compliance should be published from various locations including university settings, specialist practices and from different geographic and socio-economic environments to highlight difference and establish acceptable levels of compliance. These levels could subsequently be used as references for the internal quality control of periodontal therapy in various settings.

CONCLUSION

In conclusion, it is possible to obtain a high level of acceptance for periodontal therapy and maintenance therapy in a specialist referral practice in rural Norway. It is not possible to pinpoint any one factor responsible for such high levels of compliance. However, a stable population in addition to geographic and cultural factors may help to explain the results reported. It is also likely that the referring

dentists play an important part in motivating their patients to comply with therapy.

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