Management of plaque related periodontal conditions

A clinical studying the assessment and management of plaque-related periodontal conditions of patients by the practitioners at a general dental practice in Hertfordshire in 2013

Abstract:
Undiagnosed and unmanaged periodontal conditions are fast becoming one of the biggest areas of litigation and complaints within the dental field. Thoroug periodontal assessment is vital for diagnosis, treatment planning and monitoring the progression of periodontal disease. This is a report of a clinical audit that studied the periodontal assessment carried out at a general dental practice in Stevenage, Herts. This audit was conducted over a seven month period, analysing 50 patients for each audit cycle. A new protocol for periodontal assessment using the guidelines of the British Society of Periodontology was introduced. The results demonstrate a marked improvement in assessing the periodontal condition of patients in this general dental practice.

Clinical relevance:
Regular periodontal assessment is required to aid diagnosis, treatment planning and monitoring of disease. Without such assessment, it is possible to misdiagnose, develop incorrect treatment plans and prevent objective assessment of disease progression. With the periodontium being the scaffolding for all other restorative techniques performed by dentists, this is an essential area which must not be overlooked.

Aim:
The aim of this audit is to assess periodontal screening and subsequent non-surgical periodontal treatment for patients with plaque-related periodontal conditions at the practice compared to that suggested in guidance documents.

Null Hypotheses:
The five dental practitioners being audited would not exceed the expected percentage of 50 per cent of patients being provided with Gold Standard treatment with regards to periodontal monitoring and management.

The five dental practitioners being audited would exceed the expected percentage of less than 10 per cent of patients being provided with Unacceptable treatment with regards to periodontal monitoring and management.

A secondary objective is that, as long as the first objective is achieved, the majority of the patients receive the ‘Gold Standard’ of screening and treatment with regard to surgical periodontal therapy. Specific risk factors for patients were not included, such as smoking status and medical conditions. Ten patients were chosen at random from each of the GDP’s day lists. These patients had been seen within four weeks of 17th December 2012; the start date for the audit was chosen meaning that any periodontal treatment suggested for the patient at the time of their exam was likely to have been carried out or at least started by the start date of the audit. Notes before this were not investigated as this may not represent the most current practice of the practitioners being audited.

Inclusion criteria for the patients were as follows:

• The patient must have been seen for an exam within the four weeks prior to the audit start date. This ruled out the possibility that the patient had attended for an emergency appointment in the last four weeks, where a full exam including a periodontal screening may not have been carried out.

• The patients must have been over 18 at the time of their most recent exam and any edentulous patients were excluded. This meant that an exam must have been carried out.

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Ref.1.0 Flowchart constructed in order to grade patient notes with regards to their periodontal screening and management.
include a full periodontal screening, which may not have been done for children and adolescents, or patients without their natural teeth remaining.

A flow-chart was constructed which was followed during the auditing process in order to score each set of notes based on whether sufficient periodontal screening had been carried out and whether the correct subsequent non-surgical management was recommended or carried out based on the results of the screening.

Each of the sets of notes were studied and the flowchart followed in order to grade the overall process of the monitoring and managing plaque-related periodontal disease. The flowchart is shown in Ref 1.0.

By following the flowchart, each patient's screening and management was given a score according to the number of correct steps completed. If any step had not been correctly completed this was reflected in the scoring system and lead to a lower overall score for the patient's treatment.

A standard BPE was accepted as an appropriate screening of periodontal health during a patient's exam.

If a patient had been offered the correct treatment (i.e. it was recommended) according to the findings of their screening, but had refused to accept or failed to attend for treatment suggested by the GDP, the practitioner was scored according to the steps taken up to that point in the management of the patient. This was considered acceptable treatment delivered by the GDP as it was the patient's choice not to undergo suggested procedures.

Eight patients included in the first cycle and one patient in the second cycle of audit declined treatment which was recommended to them. Two patients in the first cycle were found to be edentulous when examining the notes and so were re-selected; none were found to be edentulous in the second cycle.

Since the default recall suggested by the GDP was not investigated as this is dependent on whether sufficient periodontal screening had been carried out and whether the correct subsequent non-surgical management was recommended or carried out based on the results of the screening.

This audit included whether a diagnosis was made relating to the periodontal condition. The accuracy of diagnosis in relation to the BPE findings was not investigated as this is outside the scope of the audit.

Each grading which was given to a patient periodontal treatment according to the flowchart was then put into one of three categories: Gold Standard, Acceptable and Unacceptable. This reflected the standard of treatment delivered to each patient. The scores included in each category and explanations are as follows:

Gold Standard= 5
Represents patients who received completely correct screening and management from their GDP according to the flowchart.

The percentage of the overall cycle 1 was then calculated and this was compared to the expected percentages set out at the start of the audit.

\[ \text{Ref 1.1} \]

**Table 1.0**

<table>
<thead>
<tr>
<th>BPE Score and Criteria</th>
<th>Management</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy periodontal tissues; No bleeding after gentle probing</td>
<td>Further Investigations: None Treatment: Appropriate preventive care</td>
<td>As per next check-up (6 monthly)</td>
</tr>
<tr>
<td>Bleeding after gentle probing; no presence of calculus, plaque retention factors or inflamed margins; gingival crevice 0-3mm</td>
<td>Further Investigations: Patient's OH habits; some visual inspection of plaque or investigation using disclosing agents Treatment: Oral hygiene instruction and prophylaxis</td>
<td>As per next check-up (6 monthly)</td>
</tr>
<tr>
<td>3: Shallow pockets of 3.5 to 5.5mm found in the sextant (black band of WHO 10 probe partially visible)</td>
<td>Further Investigations: Pocket probing depths; bleeding on probing in sextants with BPE 3 Treatment: As above plus root superficial debridement in areas where pockets 4mm or more; Consider specialist referral</td>
<td>3-4 months</td>
</tr>
<tr>
<td>4: Deep pockets of 6mm or more found in sextant (black band of WHO 10 probe not visible)</td>
<td>Further Investigations: Pocket probing depths; bleeding on probing in all sextants Treatment: As above</td>
<td>3-4 months</td>
</tr>
<tr>
<td>≥ 4: Function involvement, recession and probing depth of 7mm or more.</td>
<td>Further Investigations: As for BPE 4 plus Function involvement, suppuration, mobility, recession in sextants with BPE * Treatment: As above As above; Treatment of specific conditions as appropriate</td>
<td>3-4 months</td>
</tr>
</tbody>
</table>


**Table 1.1**

| Gold Standard | > 50 | 32 |
| Acceptable | ≤ 50* | 56 |
| Unacceptable | < 10 | 12 |

**Table 1.2**

| Gold Standard | > 50 | 74 |
| Acceptable | ≤ 50* | 24 |
| Unacceptable | < 10 | 2 |

(Where Gold Standard and Unacceptable treatments are within the stated expected values)
The following emergency resuscitation drugs¹ are available from BOC Healthcare:

- Glyceryl trinitrate (GTN) spray (400 micrograms/dose)
- Salbutamol aerosol inhaler (100 micrograms/dose)
- Adrenaline injection (1:1000, 1 mg/ml)
- Aspirin (300 mg)
- Glucagon injection (1 mg)
- Oral glucose gel
- Midazolam 10 mg (buccal)

Features of the complete drugs kit:

- Supplied in a bespoke bag for easy storage and transport²
- Supplied with algorithms on management of medical emergencies
- Items can be bought individually or as part of a combination³
- No intravenous access required for the drugs

¹ All drugs are only available to prescribing medical professionals
² Bag is an optional extra and will incur a charge
³ Only applies to certain products

Results Cycle 1:
The expected and actual percentages of each category found during the first cycle of the audit are shown below.

It was expected that Gold Standard screening and treatment for plaque-related periodontal conditions should make up more than 50 per cent of the results and that Unacceptable periodontal screening and treatment should make up less than 10 per cent. If both of these criteria are satisfied, Acceptable treatments would represent anything from 0 per cent to 50 per cent, which is why the expected percentage for Acceptable treatments is stated as less than or equal to 50 per cent where Gold Standard and Unacceptable treatments are within the stated expected values. Where Gold Standard treatments do not make up more than 50 per cent of the results and that Unacceptable periodontal screening and treatment should make up less than 10 per cent. If both of these criteria are satisfied, Acceptable treatments would represent anything from 0 per cent to 50 per cent, which is why the expected percentage for Acceptable treatments is stated as less than or equal to 50 per cent where Gold Standard and Unacceptable treatments are within the stated expected values. Where Gold Standard treatments do not make up more than 50 per cent, but Unacceptable treatments make up less than 10 per cent, the Acceptable treatment percentage will rise above 50 per cent.

As shown by the graph (Ref 1.1), the percentage of all treatment standards found in the first cycle of audit were outside the expected values. The Acceptable level of treatment was delivered to 56 per cent of patients included in the audit, which is above the expected 50 per cent. Due to the Unacceptable treatment being above the expected 10 per cent of patients provided this level of treatment, this meant that the Gold Standard level of treatment was delivered to less than 50 per cent of patients. The results from the first cycle of audit prove both null hypotheses correct, and thus the aims of the audit to disprove these are not met during this cycle. Therefore, changes must be implemented at the practice in order to improve the levels of treatments being provided to patients at the practice with regards to their periodontal condition and disprove the hypotheses.

In order to improve these results, the Gold Standard level of treatment provided must be increased and the Unacceptable level of treatment provided must be decreased.

When examining the raw data collected during cycle one of the audit, there are some obvious areas which needed to be improved in order to increase the level of Gold Standard treatment and decrease the level of Unacceptable treatment provided. Where treatment was Unacceptable, this was mainly because a BPE had not been performed at any examinations within the last year. Another point to note was that the majority of treatments provided within the Acceptable

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Periodontal disease is becoming increasingly prevalent amongst today’s population due to, amongst other factors, people living for longer and maintaining their natural teeth later into life.

The next step to improve the results further would be to ensure that all dentists are using the stickers during every adult patient exam, as where this wasn’t being done, some elements were still being omitted resulting in a pattern which was less than Gold Standard. In the future the monitoring and management of periodontal condition will need to be re-audited to ensure these standards are maintained and improved on where possible. The results from both cycles can be seen represented in the pie charts in Ref 1.4.

Limitations and Improvements to the Audit:

There are many limitations to this audit and possible improvements which could be made to refine the results and give a much broader and more accurate representative of periodontal screening and treatment at the practice. Firstly, a very small sample size was considered. According to the number of patients recorded on the practice system, 50 patients made up about 0.56 per cent of the total population population of the practice. A much larger sample size would be needed to make the results of the audit more reliable.

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Changes implemented to improve overall standard of treatment provided:

As shown in the table (1.2) and the graph below (Ref 1.5), the results from the second cycle of the audit were found to be within the expected values set out at the beginning of the audit, therefore disproving both the null hypotheses. The audit has therefore achieved its aim by improving the overall standard of monitoring and management of patient’s periodontal conditions at the practice. It was found during the second cycle of audit that where the stickers were used in the patient’s notes, Gold Standard treatment was delivered or planned, resulting in the significant improvement in the findings during the second cycle, recording the score.

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Another improvement which could be picked up on with the current audit; only one examiner carried out the audit. This person may have had different judgements on whether the notes displayed ‘correct’ or ‘appropriate treatment’ according to the chart and flowchart which were followed when carrying out the audit. Again, it would be improved by having a second examiner present when auditing the patient’s notes, giving the opportunity for discussion and in order that a more rounded decision is made if there is any query over the treatment provided.

For the patients who refused to accept or commence appropriate treatment based on their BPE score, it was assumed that the practitioner explained the risks of not having the treatment suggested to the patient. It was sufficient for the patient to understand. For completeness, this aspect should be checked from the notes taken on the day to ensure these patients were able to make an informed decision on the treatment they had chosen to opt out of.

It was noted by members of staff at the practice that the stickers used to improve the results were a costly way of doing so, due to the expense of purchasing the stickers and then printing the design onto them. Following a successful trial period of the stickers use in patients’ notes at the practice, it may be more cost-effective to create a stamp which includes the information on the sticker, and use this to create the same template using the patients’ notes instead. With this method, staff and GDP’s at the practice would be able to use the stamp multiple times, with only the initial expense of the stamp itself and occasional cost of ink pads.

Conclusion: Periodontal disease is becoming increasingly prevalent amongst today’s population due to, amongst other factors, people living for longer and maintaining their natural teeth later into life. For this reason it is essential to identify and manage any periodontal conditions as early as possible in the disease process in order to delay the deleterious effects of the condition and prevent it progressing further. In order to do this, we as dental professionals must have simple and effective methods of recording periodontal screenings and diagnoses so that we may recommend and deliver appropriate treatment to patients for these periodontal conditions.

As demonstrated by the implementation of a simple pro-forma during a patient examination, in this case in the form of a sticker, periodontal screening and management can be greatly improved. This template quickly and effectively allows the practitioner to cover all relevant areas of periodontal screening and management and means it is less likely that any essential components will be omitted from the process. With a reliable and repeatable procedure such as this in place, the periodontal condition of patients attending the practice is more likely to remain healthier for longer. This will subsequently improve the prognosis of all other dental procedures delivered by the GDP, giving the patients a better quality of care overall.

The presence, or otherwise, of risk factors for periodontal disease was not accounted for in this audit. The aim of the audit was to determine whether the correct non-surgical and surgical treatment was being carried out for each patient according to the screening results, regardless of the risk factors. In the GDP’s at this practice, it was found during the second cycle of audit that where the stickers were used in the patient’s notes, Gold Standard treatment was delivered or planned, resulting in the significant improvement in the findings during the second cycle, recording the score.

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