Acupuncture in the management of anxiety related to dental treatment: a case series

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ABSTRACT

Background Anxiety related to dental treatment is a common phenomenon that has a significant impact on the provision of appropriate dental care. The aim of this case series was to examine the effect of acupuncture given prior to dental treatment on the level of anxiety.

Methods Eight dentists submitted 21 case reports regarding the treatment of dental anxiety. The level of anxiety was assessed by the Beck Anxiety Inventory (BAI). Only patients with moderate to severe anxiety (BAI score ≥16) were included. The remaining 20 patients, 16 women and 4 men, with a mean age of 40.3 years, had a median BAI score of 26.5 at baseline. The BAI score was assessed before and after the acupuncture treatment. All patients received acupuncture treatment for 5 min prior to the planned dental treatment using the points GV20 and EX6.

Results There was a significant reduction in median value of BAI scores after treatment with acupuncture (26.5 reduced to 11.5; p < 0.01), and it was possible to carry out the planned dental treatment in all 20 cases after acupuncture treatment. Previously this had only been possible in six cases.

Conclusion Acupuncture prior to dental treatment has a beneficial effect on the level of anxiety in patients with dental anxiety and may offer a simple and inexpensive method of treatment. However, the present results need to be tested in a larger randomised clinical trial in order to evaluate the effectiveness of the acupuncture treatment in patients with dental anxiety.

INTRODUCTION

Anxiety related to dental treatment is a common and significant problem for many people and in severe cases dental anxiety may result in compromised oral health due to avoidance of dental care.1,2 The estimated prevalence of pronounced dental anxiety is about 5% in the populations of Western countries, and an additional 20–30% report moderate dental anxiety.3–6 Several studies have been used to treat dental anxiety.7 Sedatives are commonly used to provide anxiolysis, and these agents appear to be effective, but the safety concerning the use of them is still controversial.8 Psychotherapeutic interventions are also commonly used and include behaviourally oriented approaches such as applied relaxation, biofeedback, behaviour therapy, systematic desensitisation and hypnosis as well as cognitive therapy.9 Studies on these interventions have shown that despite their heterogeneity each of them may improve patient capacity to cope with dental care over time and lead to reduction in self-reported anxiety.9 These techniques are, however, time consuming and demand psychotherapeutic education and skills.

Acupuncture has been reported to have a beneficial effect on dental anxiety,10 however this report is only anecdotal and no details are given. The literature is generally sparse with regard to the use of acupuncture in stress and anxiety. In a systematic review of Pilkington et al 2007,11 the authors identified 12 studies regarding anxiety and anxiety disorders; among those 10 were randomised controlled studies. Four of the studies focus on anxiety in general and six focused on preoperative anxiety. All trial reported positive findings, however, the methodological quality of the studies were often insufficient.

Dentists practicing acupuncture have experienced that their patients are less anxious and accept dental treatments more easily after acupuncture.12 However, the available reports are all of anecdotal nature, and the results are not presented using a validated scale.13 We therefore found it imperative to present a series of case reports assessing the use of acupuncture for dental anxiety, using rigorous scientific methodology.

MATERIALS AND METHODS

Patients Ten dental practices were initially involved in this case study. A total of 21 case reports were received from eight dentists (one to three cases from each dentist) during a period of 18 months. Patients, who on previous occasions had shown signs of severe dental anxiety making dental treatment impossible or only possible with difficulty, were considered for inclusion in the set of case studies. To ensure a reasonable level of anxiety, only patients with moderate to severe anxiety were included, that is, a BAI total score of ≥16. The BAI score was also assessed after treatment with acupuncture and dental surgery. One patient was included in error, but excluded from the analysis, as the BAI score at baseline was only 4, indicating a mild level of anxiety. The remaining 20 patients had a median BAI score of 26.5 (mean 28.0, range 18–45), indicating moderate to severe anxiety (see below for assessment of dental anxiety).

Assessment of dental anxiety Several scales to assess stress and anxiety are available so we took advice from a clinical psychologist, who advised that the BAI10 suited the purpose of this case series. The scale has previously been used in a Danish pilot study concerning the use of acupuncture in dental anxiety.14 The BAI is a 21-item scale which measures the level of self-reported anxiety. It has demonstrated good convergent and discriminating validity for measuring anxiety levels in...
**Table 1** Scores of the level of anxiety before and after acupuncture treatment and the patients’ (n=20) and dentists’ (n=8) rating of the patients’ reactions to previous and current dental treatment. Results are given in median values (range)

<table>
<thead>
<tr>
<th></th>
<th>Patients’ rating of previous dental treatment</th>
<th>Patients’ rating of current dental treatment</th>
<th>Dentists’ rating of their patients’ dental anxiety</th>
<th>p Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>How did you feel 24 h before the dental treatment?</td>
<td>4 (1–5)</td>
<td>3 (1–5)</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>How did you feel when you entered the dental clinic?</td>
<td>4 (2–5)</td>
<td>3 (1–5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How did you feel during your dental treatment?</td>
<td>4 (2–5)</td>
<td>2 (1–2)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>BAI score for dental treatment</td>
<td>26.5 (18–45)</td>
<td>11.5 (0–23)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>How did you score the patient during the previous treatment?</td>
<td></td>
<td>4 (3–5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How did you score the patient during the current treatment?</td>
<td></td>
<td>2 (1–5)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Was it possible to complete the planned treatment during the previous treatment? Yes/no</td>
<td></td>
<td>6/14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Was it possible to complete the planned treatment during the current treatment? Yes/no</td>
<td></td>
<td>20/0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table presents the Beck Anxiety Inventory (BAI) scores from the previous (estimated by recall) and current dental treatments. It also shows the dentists’ assessment of the patients during previous and current treatment. Patients and dentists are using a categorised scale from 1 to 5, where 1 indicates no fear and 5 the worst imaginable fear. The BAI score is based on 21 questions, where each question is assessed on a 4-point scale ranging from 0 to 3, where 0 indicates no anxiety and 3 indicates worst possible anxiety. A total of 63 points can be achieved (see Materials and methods).

Clinical and non-clinical populations. The 21 items are descriptive statements of anxiety symptoms. Each item/symptom is rated on a 4-point scale ranging from 0 to 3. The BAI total score is the sum of the ratings for the 21 items/symptoms and the maximum score is 63 points. A total score between 0 and 7 points indicates a minimal level of anxiety, a score ranging from 8 to 15 reflects mild anxiety, a score from 16 to 25 indicates moderate anxiety and a total score ranging from 26 to 63 indicates severe anxiety.

**Treatment with acupuncture**

The British Dental Acupuncture Society has defined a set of criteria for achieving the Diploma of Basic Competence: dentists are required to attend a number of didactic and practical courses. To assess how the dentist approaches relevant dental diseases, a certain number of forms must be completed by the dentist with regard to particular dental related conditions, such as temporomandibular dysfunction, controlling of the gagging reflex, management of dental anxiety, etc. This study is based on case reports submitted from eight dentists who are studying for the basic diploma from the British Dental Acupuncture Society. Accordingly, they have all undergone the same basic education in using acupuncture for the treatment of dental anxiety.

It has been found in a previous pilot study that the acupuncture points GV20 and EX6, located on the top of the head, have a specific relaxing effect, and the aim was to extend our observations in a larger study among dentists in the UK. The point EX6 is located 1 cun anterior, posterior and laterally from the point GV20. To make a comparison possible, dentists were asked to treat the patient with acupuncture 5 min prior to the planned dental treatment. However, the selection of points used was stipulated, but the dentist was free to use additional or different points, if they felt it more appropriate. Disposable stainless steel acupuncture needles 0.22×13 mm were inserted in the chosen points and rotated clockwise and anticlockwise for 5 s. After de qi was obtained, the needles were left in situ during the entire dental treatment without further stimulation and then removed.

Since the treatment with acupuncture was supplementary to the dentist’s standard procedures for anxious patients, a telephone call was made to the local ethics committee in Sheffield to clarify whether notification to the committee was required. They determined that ethics approval was unnecessary as it was an observational study only.

**Dental treatment**

The main reason for offering patients acupuncture was odontophobia, and all patients suffering from odontophobia were, despite the planned dental treatment, offered acupuncture treatment. The dental treatment consists of minor dental procedures such as cleaning of the teeth (n=7) and dental examination (n=13).

**Statistical analysis**

The Wilcoxon signed rank test was used in order to compare the BAI scores before (ie, baseline) and after the acupuncture treatment. Spearman rank correlation was applied to assess associations between anxiety scores, the patients’ age and duration of dental anxiety. p Values of ≤0.05 were considered statistically significant.

**RESULTS**

The patient group included 16 women and 4 men with a mean age of 40.3 years (range 20–71). The duration of dental anxiety varied for 2–30 years (mean: 10.76 years, median: 10 years). There was no significant correlation between the level of dental anxiety and the patient’s age and duration of dental anxiety. In 14 cases planned dental treatment had had to be cancelled in the past due to the patients’ dental anxiety. In the remaining six cases treatment had been partly completed with a great deal of effort from both dentist and patient. Three of the patients had required general anaesthesia and six other patients had required sedatives such as diazepam or midazolam in relation to previous dental treatment. Two patients, one of whom also required general anaesthesia, needed to take sedatives before dental treatment. Eleven of the patients had received on average one (range one to five) dental treatment within the last 12 months. At baseline, the patients reported moderate to severe anxiety with a median BAI score of 26.5 (range 18–45). After acupuncture and dental surgery, the mean BAI score had significantly decreased to median 11.5 indicating mild anxiety (p<0.001) See table 1.

The patients were assessed by the dentist at the previous treatment to 4 (3–5) on a scale 1–5, where 0 indicated no anxiety and 5 indicated severe anxiety. At the current treatment, the dentist scored the patient to 2 (1–5) and obviously the treatment was easier for the dentist to carry out. With acupuncture needles in place, it was possible to complete the planned dental treatment
in all 20 patients. No serious adverse effects were recorded, only sleepiness in two patients.

DISCUSSION

The aim of the present case series was to examine the potentially beneficial effect of acupuncture as a supplement to the dentist’s standard treatment of dental anxiety, which in the majority of cases consists of using sedatives, distraction and relaxing audio tape. It was possible, on this occasion, to complete the planned treatment for all 20 patients, in contrast to the previous treatment, where the planned treatment was cancelled in 14 cases and in the remaining six cases treatment had been partly completed with a great deal of effort from both dentist and patient. Furthermore, there was a significant reduction in the BAI score (16.6 points) after acupuncture treatment. Some of this might be attributed to the fact that the dental treatment had been completed, and the patients’ responses might be biased by the presence of their dentist. However, it seems likely that acupuncture contributed. It is well known that patients can feel tired after acupuncture, and some patients occasionally fall asleep if left in a quiet room for a short time. This is probably due to release of endorphins. The patients had not been aware that the dentist would offer acupuncture prior to their most recent treatment, and it is likely that the relaxing effect induced was due to acupuncture.

The literature in this field is scant. Pilkington and colleagues concluded in their paper that there is some evidence in favour of acupuncture for generalised anxiety disorder or anxiety neurosis, but there is currently insufficient evidence for firm conclusion to be drawn. This conclusion is quite obvious as some of the quoted studies report of an improvement rate of 94.3% which is unrealistic. Regarding auricular acupuncture, there seems to be some limited evidence in favour of acupuncture in preoperative anxiety. However, two of the studies concern acupressure and should have been excluded from the review.

Several textbooks recommend the point GV20 for stress and anxiety. From the study of Pilkington and colleagues, it appears that the point GV20 has been used in four of the quoted studies concerning body acupuncture. Moreover, additional points were used, but it is difficult to find any constancy, and in most cases any logic, in the additional point selection.

In the present case series, all dentists used the points GV20 and EX6, and they found no need for additional points. This combination of acupuncture points has generally been considered effective in the treatment of stress and anxiety, but has never been proven in a clinical trial. In this case series, 12 out of 20 patients responded positively to acupuncture treatment, based on the BAI scale, but in clinical practice all 20 patients accepted the planned treatment. Although the number of patients is small, there seems to be support for the effectiveness of the point GV20. Several point combinations have been used in the quoted studies and if one combination is superior to another, it needs to be confirmed in a large scale randomised controlled study.

CONCLUSION

In the present case series we have shown that 60% of patients suffering from dental anxiety respond to treatment with acupuncture, based on the BAI scale, and 100% of patients respond clinically. However, further research is needed, and in our opinion the subject seems suitable for a multi-centre study. The technique is easy to learn and inexpensive, however, recommendation should not be made until a controlled trial has been performed.

Competing interests None.

Ethics approval The local ethics committee in Sheffield determined by telephone that ethics approval was unnecessary as it was an observational study only.

Provenance and peer review Not commissioned; externally peer reviewed.

Patient consent Details have been removed from this case description/these case descriptions to ensure anonymity. The editors and reviewers have seen the detailed information available and are satisfied that the information backs up the case the authors are making.

Contributors PR participated in the concept and design of the study, the collection, analysis and interpretation of data as well as in drafting the manuscript. MB participated in the concept and design of the study and in drafting the manuscript. SG took part in the design of the study and in drafting and revising the manuscript. AMPL participated in the analysis and interpretation of data, the statistical analysis and in drafting and revising the manuscript. All four authors read and approved the final manuscript. This study is the first of its kind.

REFERENCES


Summary

► Anxiety about dentistry often prevents even minor dental procedures.
► After acupuncture, 20 patients were able to undergo dental work.
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