

Gag reflex control through acupuncture: a case series

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ABSTRACT

Background Many patients avoid dental appointments because of severe gagging when they have work performed, such as taking impressions. There are several methods known to alleviate gagging, and some studies have suggested that acupuncture may be effective in reducing gag reflex. The aim of the present study therefore was to evaluate whether acupuncture can produce a reduction of the gag reflex.

Methods A total of 20 patients, aged between 19 and 80 years, with history of gag reflex on taking dental impressions, were recruited. All patients fulfilling the inclusion criteria had an upper and lower dental alginate impression taken without acupuncture, and a second upper and lower alginate impression taken immediately after acupuncture based on traditional Chinese medicine. After each impression, the patients recorded their emetic sensation using a visual analogue scale (VAS).

Results The results showed a significant ($p < 0.05$) reduction in the gag reflex scores after acupuncture. For upper impressions, they fell from 6.8 (1.1) to 1.1 (1.1); and for lower impressions, from 5.45 (1.0) to 0.4 (0.7) (mean (SD)).

Conclusions The findings from our study suggest that acupuncture may be useful for preventing and treating gag reflex, and justifies further study.

INTRODUCTION

The gag reflex is a normal protective, physiological mechanism that prevents foreign objects or noxious material from entering the pharynx and larynx. It can be activated by stimulating certain trigger areas in the oral cavity, or by psychogenic mechanisms, involving higher brain centres. Some people have a reduced or absent reflex, while others have a pronounced one.

In everyday dental practice, dentists encounter patients who either believe they will gag, or subsequently do gag. Gagging is most frequently experienced during taking impressions, but is also reported during taking radiographs,

restoration work in posterior teeth and, in some individuals, inserting a finger for examination purposes.¹ A significant number of patients attend for dental treatments that require impressions, and for those with gagging problems this can be a horrendous experience. Therefore, reducing the ordeal is better for all involved.²⁻³ The control of this reflex is very important in order to improve the well-being of the patient, who is often subjected to manoeuvres that are not comfortable that can evoke the reflex.³⁻⁴

Many techniques have been described that attempt to overcome this problem, and having a variety of management strategies is necessary to aid the delivery of dental care. Acupuncture is one of the several methods thought to relieve gagging.

Acupuncture is over 2000 years old and achieves neuromodulation (traditionally described as re-establishing a balance flow of energy, termed *Yin* and *Yang*) throughout the body through 12 meridians and over 300 acupuncture points. The acupuncture needles in traditional Chinese medicine (TCM) are described as releasing blocked energy or *qi*, and recipients of acupuncture have described the sensation as similar to being 'pricked with a toothpick'.⁵⁻⁷

Acupuncture has been used to decrease the emetic reflex induced by taking dental impression and to improve the state of anxiety and stress response induced by dental examination.⁸ A previous case series found improvements in the gag reflex after the use of acupuncture.⁹ Stimulation of an acupuncture point prior to undergoing treatment has been used to help control the gag reflex, allowing dentists to perform a variety of procedures without compromising the patient's safety and comfort.

The aim of this study was to evaluate the effectiveness of acupuncture for the treatment of gag reflex.²

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METHODS

A non-randomised clinical crossover study was carried out among patients from the Section of Orthodontics, Department of Surgical, Oncology and Stomatologic Sciences, University of Palermo, Italy. The group included 20 participants (6 men and 14 women) with an age range of 19–80 years. All patients were evaluated for inclusion when the history and examination were being taken. The inclusion criteria for acupuncture were: (1) a positive history of nausea in taking dental impression, with visual analogue scale (VAS) score of >5; (2) good general health; (3) no use of drugs that affect the gag reflex in the month before and during our trial; (4) the exclusion of other conditions that can cause gag reflex and; (5) for women, not being pregnant or lactating.

The study was carried out in accordance with the ethical standards of the Helsinki Declaration of 1975. This investigation was approved by the Ethics Committee of the Faculty of Medicine, Department of Surgery and Oncology of the University of Palermo. All participants received oral and written information regarding the study purpose and experimental protocols and provided written informed consent before being enrolled in the study. All participants scored the gag reflex sensation using a VAS from 0–10, with 0 indicating absence of gag reflex and 10 maximum sensation.

The crossover study was conducted in two phases: first, upper and lower alginate impressions were taken, without acupuncture, as a baseline. Second, after 1 month, upper and lower impressions were taken immediately after acupuncture. The mean VAS scores taken at the end of each individual impression (upper and lower) without and with acupuncture were then compared.

Acupuncture

Each patient received acupuncture at fixed points. The needles were manipulated for 25–35 s prior to dental treatment and remained in place until the patient was discharged.¹⁰

The acupuncture technique employed in the study was based on TCM methods. Sterile, disposable, needles with stainless steel bodies and copper handles were applied through a guide tube (Hwato, Suzhou, China). The needles were 0.25 mm in diameter and 13 mm in length^{11 12}; the depth of insertion varied in relation to the anatomic area.

The acupuncture points stimulated were: PC6 (*Neiguan*), EX 1 (localised in the skin projection of the forehead/nasal suture) and CV24 (*Chengiang*). The needles were inserted 0.3–0.5 mm and rotated clockwise and anticlockwise. *De qi* was elicited accompanied by redness and feeling of numbness around the needles. The operator (GB) had experience in the clinical application of acupuncture in the field of dentistry. Then, the impression tray was inserted in the patient's mouth and the dentist continued the

procedure. The needles were left in situ throughout the procedure and removed on its completion. All patients were treated by the same operator (GB), and no adverse reactions were reported.

Statistical analysis

The Student t test was used to compare mean VAS scores, without and with acupuncture. The significance level was set at $p < 0.05$.

RESULTS

The patients included 14 women and 6 men, with mean ages of 45 and 46 years, respectively. All patients fulfilling the inclusion criteria completed the study. Table 1 states the individual VAS scores.

The VAS scores for gag reflex were significantly lower with than without acupuncture for upper and lower impressions ($p < 0.05$ for both).

There was no significant difference between the responses in male and female participants.

DISCUSSION

In our study of 20 patients with a history of gag reflex for taking impressions, we found a significant reduction of gag reflex symptoms when assessed after acupuncture for upper and lower alginate impressions.

Table 1 Age and gagging scores for all patients

Age, years	Upper impression without acupuncture	Upper impression with acupuncture	Lower impression without acupuncture	Lower impression with acupuncture
19	6	2	5	0
22	7	0	5	0
27	6	1	5	0
30	8	1	6	0
31	8	1	7	1
32	5	2	4	0
34	7	0	4	0
41	7	0	5	0
43	6	4	5	2
45	6	1	6	0
47	5	2	5	1
49	9	0	5	0
51	8	0	6	0
56	6	0	5	1
57	8	2	7	0
58	7	3	5	1
62	6	1	7	2
64	7	1	6	0
64	7	0	4	0
80	7	1	7	0
Mean (SD):	6.8 (1.1)	1.1 (1.1)	5.45 (1.0)	0.4 (0.7)
(16.2)				

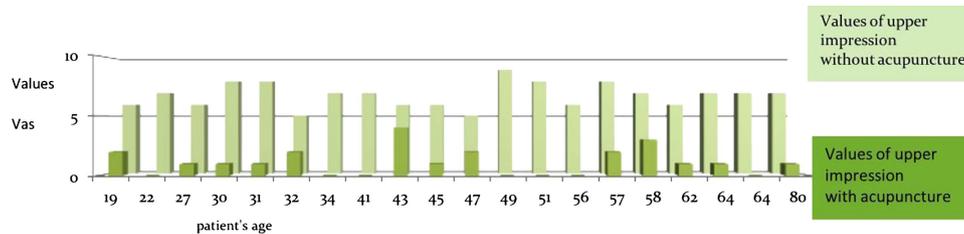


Figure 1 Values of upper impression without and with acupuncture. VAS, visual analogue scale.

Table 1 indicates the severity of symptoms without acupuncture: 25% of participants had a gag reflex score of eight or nine, 35% a score of seven and 30% a score of seven. Figure 1 illustrates the size of the reduction in gagging scores on upper impression after acupuncture. It is evident that every patient responded to acupuncture, showing a clinically significant reduction of the scores for the gag reflex. This result was seen in men and women.

Limitations of our design include that the improvement in symptoms may have been due at least in part to other factors, such as familiarity with taking repeated impressions. Also, we cannot determine the role of the needles themselves without using a sham control group.

A recent Cochrane review showed that 31% of adults are fearful of dental treatment. A patient who is phobic may develop reluctance or avoidance towards dental treatment and deprive themselves from receiving proper dental care.¹³ A patient who is anxious during dental procedures may also hinder the operator from executing proper treatment.¹⁴

Fiske *et al* have shown that patients with gag reflex do not appeal to dentists. Many studies by this group have compared techniques to combat gag reflex; among these, acupuncture appears the most valid. The studies of Rosted *et al* have shown that gag reflex improved after acupuncture and the patients better accepted dental treatment. Our results were consistent with these other studies.

The overall benefits of an approach using acupuncture include reduction of emetic reflex,^{13 15} greater patient comfort during dental practice,¹⁶ good patient compliance,¹⁷ acute and chronic pain treatment,^{18 19} immune system strengthening²⁰ and reduced patient/operator stress.¹⁶

The technique of acupuncture is potentially useful because is relatively non-invasive, is cheap and requires little additional time. Also, it can be applied even in the presence of other diseases.^{21 22} All the patients tolerated the acupuncture extremely well and were able to travel home without assistance.

CONCLUSIONS

In this study, gag reflex induced by taking upper or lower dental alginate impressions was significantly reduced after giving acupuncture. If parallel arm

studies confirm this to be an effect of acupuncture, then acupuncture could be a useful option for controlling gag reflex in odontostomatology, also relaxing the patients and thus facilitating dental surgery and saving time.²³

Acupuncture has the advantages that it can be used in patients with systemic health problems by avoiding the use of drugs,²⁴ and uses cheap instruments.

The results suggest it is justified to undertake more rigorous prospective and randomised studies to provide a better understanding of this phenomenon.

Summary points

- ▶ A total of 20 patients with a history of nausea during dental work were included.
- ▶ Dental impressions were taken first without, then with acupuncture.
- ▶ Gagging scores were reduced significantly after acupuncture.

Contributors GB drafted the manuscript, and was involved in the conception and design of the study. GB and AF wrote the statistical analysis plan. The authors had access to all data sources, contributed to the interpretation of results, commented on the report and approved the final version for publication. GB is the guarantor.

Competing interests None.

Patient consent Obtained.

Ethics approval This investigation was approved by the Ethics Committee of the Faculty of Medicine, Department of Discipline Surgery and Oncology and of the University of Palermo.

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REFERENCES

- 1 Means CR, Flenniken IE. Gagging- a problem in prosthetic dentistry. *J Prosthet Dent* 1970;23:614–20.
- 2 Johnson DJC. Acupuncture for dentists-10 central treatments. *Acupunct Med* 2005;23:45.
- 3 Farrier S, Pretty IA, Lynch CD, *et al*. Gagging during impression making: techniques for reduction. *Dent Update* 2011;38:171–2, 174–6.
- 4 Kumar S, Satheesh P, Savadi RC. Gagging. *RCN Y State Dent J* 2011;77:22–7.

- 5 Au F, Cresswell J. An investigation into the use of traditional Chinese medicine in the treatment of orofacial disorders. *Acupunct Med* 1997;15:43–8.
- 6 Rosted P, Bundgaard M, Pedersen AML. The use of acupuncture in the treatment of temporomandibular dysfunction—an audit. *Acupunct Med* 2006;24:16–22.
- 7 Di Stanislao C. Agopuntura e tecniche correlate nel trattamento delle dermopatie. *La Moxa TM A* 1993;12:20–4.
- 8 Sari E, Sari T. The role of acupuncture in the treatment of orthodontic patients with a gagging reflex: a pilot study. *Br Dent J* 2010;22:208–10.
- 9 Fiske J, Dickinson C. Acupuncture: The role of acupuncture in controlling the gagging reflex using a review of ten cases. *Br Dent J* 2011;190:611–13.
- 10 Baroli A. Terapia combinata, omeosignatria omotossicologica plus erogazione radiazione elettromagnetica modulata tramite fonte multipla, nel trattamento della tendinite acuta della spalla. *Yi Dao Za Zhi* 1999;12:16–18.
- 11 Escobar LP, Ballestros J. Miofascial pain syndrome. *Orthop Rev* 1987;110:708–13.
- 12 Di Stanislao C, Lommelli O, Evangelista L. La palpazione in MTC. *Riv It d'Agopuntura* 2003;5:40–5.
- 13 Wong LB. Acupuncture in Dentistry: its possible role and application. *Singapore Healthc* 2012;21:20–8.
- 14 Rosted P, Bundgaard M, Gordon S, et al. Acupuncture in the management of anxiety related to dental treatment: a case series. *Acupunct Med* 2010;28:3–5.
- 15 Di Stanislao C. Due casi di patologia reumatica tendinea trattati con agopuntura, omeopatia e sistema fisico Tinki. *Yi Da Za Zhi* 1999;12:13–15.
- 16 Michalek-Sauberer A, Gusenleitner E, Gleiss A, et al. Auricular acupuncture effectively reduces state anxiety before dental treatment—a randomised controlled trial. *Clin Oral Investig* 2012;6:1517–22.
- 17 Di Stanislao C. L'agopuntura e la MTC in Campo cosmetologico. *Kosme* 2003;1:10–15.
- 18 Rosted P. The use of acupuncture in dentistry: a systematic review. *Acupunct Med* 1998;16:43–8.
- 19 Norrbrink C, Lundeberg T. Acupuncture and massage therapy for neuropathic pain following spinal cord injury: an exploratory study. *Acupunct Med* 2011;29:108–15.
- 20 Rempp C. Le Liquides en Médecine Chinoise. *Rev Fr D'Acupunct* 1995;90:13–20.
- 21 Han JS. Acupuncture: neuropeptide release produced by electrical stimulation of different frequencies. *Trends Neurosci* 2003;26:17–22.
- 22 Rosted P, Bundgaard M, Fiske J, et al. The use of acupuncture in controlling the gag reflex in patients requiring an upper alginate impression: an audit. *Br Dent J* 2006;201:721–5.
- 23 Rosted P, Bundgaard M. Can acupuncture reduce the induction time of a local anaesthetic?—a pilot study. *Acupunct Med* 2003;21:92–9.
- 24 Dios PD, Lestón JS. Oral cancer pain. *Oral Oncol* 2010;46:448–51.