

ORIGINAL RESEARCH

Evaluation of the effects of acupuncture on P6 and anti-gagging acupoints on the gag reflex

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ABSTRACT

Introduction: Hyperactive gag reflex can make dental treatment procedures intolerable for some patients; so, it is highly important for the dentist to control it. Acupuncture is a technique used to control this phenomenon. In this study, the effects of two acupoints, anti-gagging and P6, on the gag reflex control were analyzed. **Materials and Methods:** In this clinical trial study, a total number of 100 healthy people were classified into four groups. Acupuncture and pseudo-acupuncture procedures were performed on anti-gagging and P6 points based on the group. Before and after acupuncture or pseudo-acupuncture, gag reflex severity was measured via stimulation of the soft palate, tonsils, and root of the tongue. Obtained data was analyzed using statistical package of social sciences (SPSS) 22 statistical software. **Results:** Acupuncture reduced gag reflex at both points, but pseudo-acupuncture did not reduce the gag reflex. Moreover, no significant difference was observed between acupuncture on P6 and anti-gagging points. **Conclusion:** Acupuncture on anti-gagging and P6 points can be effective in controlling the gag reflex during routine dental procedures.

Key words: Acupuncture, dentistry, gag reflex

Introduction

Gag reflex is an unconscious feeling that occurs as a result of intraoral manipulation. Neural impulses from receptors of the soft palate and posterior part of the tongue are transferred to the central nervous system in medulla oblongata by afferent nerves. They are then transferred to the muscles involved in gagging by the vagus nerve and cause muscular contractions.^[1-3]

Various reasons have been proposed for severe gag reflex. In a review article, Bassi classified the causes of gag reflex into iatrogenic factors, systemic disorders, and psychological disorders.^[4]

In their study, Davies *et al.*, argued that gag reflex does not exist in 37% of the healthy population,^[5] while some people suffer from severe gag reflex, making dental treatment procedures intolerable for them.^[1,3,4,6,7] Thus, appropriate management of severe gag reflex is of considerable importance. Numerous studies have been carried out on controlling severe gag reflex during dental procedures.^[6-11]

In order to control severe gag reflex, the patient's psychological stimuli have been recommended to be reduced as much as possible. Moreover, since the gag reflex is governed by the parasympathetic nervous system, drugs that selectively depress the parasympathetics may be useful.^[12,13] Scarborough applied acupressure,^[10] Yoshida made use of intravenous sedatives,^[1] and Kaviani and other researchers applied inhaled sedatives to control the gag reflex.^[14-16]

Given various treatment methods proposed for management of gagging patients, it seems helpful to investigate safe and easy techniques to manage severe gag reflex, one of which is acupuncture. Acupuncture is

Access this article online	
Quick Response Code:	Website: www.dentalhypotheses.com
	DOI: 10.4103/2155-8213.150866

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a branch of Chinese medicine that, in addition to control pain and gag reflex, is used to treat many diseases. Acupuncture makes use of thin needles to stimulate specific points of the body in order to carry out the treatments. Placing the needles on specific points of the body stimulates the peripheral nerves and provokes activities involved in the regulatory mechanism of the central nervous system.^[17-19]

Based on the acupuncture theory, the energy of life is flowing through the meridians in the body. Decrease or increase in the energy within the meridians can cause the incidence of diseases. Inserting the needles in specific points in these canals regulates the energy flow and ameliorates the illness. There are 14 meridians in the body, on which 361 points specified for acupuncture have been identified.^[18,19] The points used to control gag reflex in dentistry include CV-24, P6, and anti-gagging.^[20-22] In all the above-mentioned studies, acupuncture has been reported to be effective in controlling gag reflex; however, the impacts of different points have not been compared, yet. Thus, the aim of this study is to compare the effect of anti-gagging and P6 acupoints in controlling gag reflex.

Materials and Methods

Isfahan Regional Bioethics Committee (# 293155) has approved this study. In this randomized clinical trial, 100 healthy patients aged >18 visiting the Isfahan dental faculty and clinics, with no systemic disease, cardiac pacemaker, asthenia, and pregnancy were voluntarily selected to be included in the study through convenient sampling technique. Patients signed informed consent form before start of the trial.

The patient was seated on a dental chair, the soft palate, tonsils, and root of the tongue were stimulated by a disposable mirror and the severity of gag reflex of each region was recorded based on the scoring system, 0 = no reaction, 1 = stimulated and controllable reflex by the patient, 2 = stimulated and uncontrollable reflex by the patient. The patients were randomly assigned into four groups. In the first group, acupuncture needles were inserted into the P6 point on both sides; in the second group, placebo acupuncture was performed on the same points. In the third group, acupuncture needles were inserted into anti-gagging points on both ears and in the fourth group, placebo acupuncture procedure was carried out on the same points. After 20 minutes, the gag reflex was measured again in all four groups.

A specialist was responsible for acupuncture and another examiner was responsible for measuring gag reflex. The examiner did not know that to which group each patient belonged. To perform acupuncture procedure, 0.3-0.4 mm acupuncture needles (Lhasa OMS, Inc. Weymouth, MA, USA) were used. The needle was held vertically between the thumb and middle finger. The middle finger guides the needle while inserting into the body and prevents it from bending. Needle insertion and skin penetration should be done quickly, because it reduces the pain. Needle insertion can be performed at 90° up to the depth of 5 mm. Following insertion, the needle remains in place and the patients should not feel pain or move.^[19] In pseudo-acupuncture, electrocardiogram monitoring chest lead was placed on the points of a small part of the body and acupuncture needles were inserted into it, such that they were not inserted into skin.

Mean score of the gag reflex severity was obtained by averaging gag reflex severity scores after stimulation of the soft palate, tonsils, and root of the tongue. Wilcoxon and Mann-Whitney tests were used for statistical analysis using statistical package of social sciences (SPSS) software (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp).

Results

From 100 participants, 67% and 33% were male and female, respectively, with the mean age of 23 ± 0.8 and no significant difference between them.

Wilcoxon test revealed a significant reduction in severity of the gag reflex in the first group after acupuncture on the P6 point ($P < 0.001$), while pseudo-acupuncture on the same point in the second group caused no significant reduction in mean scores of the gag reflex ($P = 0.157$). Moreover, acupuncture on the anti-gagging point resulted in a significant reduction in severity of the gag reflex in the third group ($P < 0.001$), but no significant reduction was observed after pseudo-acupuncture on the same point in the fourth group ($P = 0.157$).

Mann-Whitney test showed no significant difference between acupuncture on P6 and anti-gagging points in decreasing severity of the gag reflex.

Table 1 depicts distribution of gag reflex severity through stimulation of different regions of the oral cavity before and after acupuncture or placebo acupuncture among four groups.

Table 1: Distribution of gag reflex severity through stimulation of different regions before and after acupuncture or placebo acupuncture among four groups

Group	Gag reflex severity	Number of patients						Mean score	
		Soft palate		Tonsils		Root of the tongue		Before	After
		Before	After	Before	After	Before	After		
1	No	0	6	0	9	0	8	1.80	0.92
	Moderate	5	12	5	11	5	12		
	Severe	20	7	20	5	20	5		
2	No	0	2	0	0	0	0	1.40	1.37
	Moderate	15	13	15	15	15	15		
	Severe	10	10	10	10	10	10		
3	No	0	17	0	11	0	8	1.45	0.65
	Moderate	13	4	14	11	14	14		
	Severe	12	4	11	3	11	3		
4	No	0	2	0	0	0	0	1.40	1.37
	Moderate	15	13	15	15	15	15		
	Severe	10	10	10	10	10	10		

Discussion

With a long history in the treatment of diseases, acupuncture is currently being used as a safe and easy technique for different medical and psychological purposes. It is also used in dentistry to treat dysfunctions like severe gag reflex,^[21,22] temporomandibular disorders,^[23] spasm of facial muscles,^[24] neuralgia,^[24-26] and salivation increase.^[27]

In the present study, both anti-gagging and P6 points reduced gag reflex during soft palate stimulation. Moreover, no significant difference was found between acupuncture on P6 and anti-gagging points. In a study, Lu *et al.*, investigated the effect of acupuncture on P6 point to control gag reflex.^[22] Their findings were similar to the results obtained in the present study, in that P6 point could decrease gag reflex. Also, in their study, Fiske *et al.*, reported that stimulation of the anti-gagging point is effective in controlling gag reflex.^[21] In the present study, the stimulation of anti-gagging and P6 points was effective in suppression of the gag reflex. Therefore, this technique is recommended to be used in dentistry in order to control gag reflex while doing dental procedures. Receiving sufficient training, the dentist can stimulate these points about 20 minutes before dental procedure and easily perform dental works afterwards.

In this study, different anxiety levels of the patients would have been effective in severity of the gag reflex. Moreover, time and type of last meal may be effective in the gag reflex which was not controlled in this study. However, further studies are required to be conducted in order to investigate the effects of different acupuncture methods on gag reflex. For instance, similar

studies are suggested to be carried out on patients with severe gag reflex.

Conclusion

Acupuncture on anti-gagging and P6 points can be effective in controlling the gag reflex during routine dental procedures.

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Cite this article as: Haghighat A, Kaviani N, Jokar S, Soltani P, Ahmadi A. Evaluation of the effects of acupuncture on P6 and anti-gagging acupoints on the gag reflex. *Dent Hypotheses* 2015;6:19-22.

Source of Support: This research project (grant no: 385268) was approved and sponsored by the vice chancellor for research at Isfahan University of Medical Sciences, **Conflict of Interest:** None declared.

