



ORIGINAL RESEARCH PAPER

Medical Science

THE POINT OF A HUNDRED DISEASES, ACUPUNCTURE FOR GAG REFLEX IN CHILDREN- A REVIEW

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ABSTRACT Traditional acupuncture has been introduced more than 2500 years ago which provides an alternative and complementary option during clinical practices. Its main mechanism is based on stimulating the nerves by altering the processes and perception of pain transmitters. It facilitates releasing natural pain relievers such as endorphins and serotonin. Its success for various dental procedures has been proved. However, its effects on controlling the gag reflex seem to be overlooked. The gag reflex is recognized as a protective reaction for stopping the entrance of any foreign bodies into the oropharynx. Pronounced gag reflexes can have negative impacts on the quality of dental procedures especially in children. Many techniques have been suggested for managing this reflex and acupuncture is one of those which seems to be overlooked recently. This paper reviews the published researches about the efficacy of this technique for eliminating the gag reflex during dental procedures

INTRODUCTION

Gagging is a reflex act produced by the transmission of afferent impulses to the center and outflow as efferent impulses to the musculature of the oropharynx.¹⁻³ The gag reflex sometimes has an undesirable impact on the efficacy of dental procedures such as intraoral examination, making dental impressions and many other clinical dental procedures in children.^{4,5} It has been stated that the responsible stimuli for the gagging might differ from person to person. In some children, the gagging is only limited to the stimulation of the surrounding tissues of oropharynx, while others might show the gagging reflex with some other stimuli except physical ones such as the sight, taste, smell of certain objects.^{6,7}

Etiology of Gagging

The causes of gag reflex can be either psychogenic or somatogenic.

Psychogenic causes

The stimuli which cause gagging have its origin in the mind. Psychic stimuli resulting from fear, anxiety and apprehension can predispose to gagging. Child's emotional factors such as appreciable mental strain and depression also have an influence as one of the causes of gag reflex.

Somatogenic causes

It is due to the presence of definite physical stimuli which acts locally. The presence of irritating foreign objects in the mouth or oropharynx may excite gag reflex. Physical stimuli may have their action either directly or indirectly.⁸⁻¹⁰

Management of Gag Reflex

Various methods have been proposed to manage the gag reflex in children.

They include;

- Relaxation
- Distraction
- Desensitization Techniques
- Psychological And Behavioral Therapies
- Local Anesthesia
- Conscious Sedation
- General Anesthesia Techniques
- Complementary Medicine Therapies Like Hypnosis¹¹

Acupuncture is another modality which has been reported to control gag reflex. It is defined as the insertion of a solid needle into

specific parts of the human body for disease prevention, therapy, or the maintenance of health.¹¹

The basic theories of acupuncture can be summarized in three below mechanisms:

- Acupuncture needles can stimulate the afferent nerves (Type I and II) or A-delta fibers which send impulses to the upper centers. At the spinal cord, enkephalin and dynorphin are mostly involved in blockage of pain in the spinothalamic tract
- Acupuncture stimulates midbrain structures by activating cells in the periaqueductal gray matter and the raphe nucleus. In response, they send descending signals through the dorsolateral tract, causing the release of the monoamines norepinephrine and serotonin in the spinal cord. These neurotransmitters inhibit pain presynaptically and postsynaptically by reducing transmission of signals through the spinothalamic tract
- Stimulation of pituitary-hypothalamic complex provokes the systemic release of beta-endorphin into the blood which can result is the release of adrenocorticotrophic hormone.^{12,13}

Acupuncture points on the body are stimulated by needles, pressure (acupressure), vacuum (cupping), laser, or electrical stimulus. The use of needle acupuncture in children is a very difficult procedure since it is an invasive technique. To overcome this difficulty, laser acupuncture and acupressure were developed. These are not only painless, but also help in achieving better patient compliance. According to ancient Chinese Medicine, energy flows in the human body along 14 meridians. On these meridians lie certain points **Qi** (energy) which when stimulated, produce specific effects on the body.

Various anti-gagging points have been recognized, such as **PC6** (Pericardium 6), **Li4** (Liver4), and **CV24** (Conception Vessel24). Stimulating these points activate mechanisms that inhibit the muscle activity of gag reflex.



Figure 1 CV24 Acupuncture Point



Figure 2 Li4 Acupuncture Point

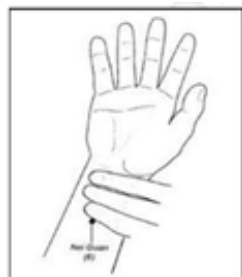


Figure 3 PC6 Acupuncture Point

Neiguan point or PC6 is an acupressure point which is considered to be one of the best determined acupressure points to control nausea and vomiting. It is a concave area at the medial aspect of the forearm, slightly below the palm, and measuring approximately one horizontal finger in width.

Goel et al in their study, since needle acupuncture is difficult to achieve in pediatric patients, laser acupuncture which allows painless stimulation was done.

Low-level laser therapy (LLLT) is being used in medicine to promote pain attenuation, also called as needleless acupuncture.

Diode Laser (iLase Laser System, Biolase, Inc., 4 Cromwell, Irvine, CA 92618, USA) with power output 0.5 mW, wavelength 940 nm, energy 4J, and 3-4 mm away from the tissue with a penetration depth of few millimetres in a defocused continuous mode with 1 inch spot size for 1 minute.

Sari and Sari designed a comparative evaluation on the role of acupuncture for preventing gagging reflex during orthodontic treatment. 45 patients were involved and divided into three groups in that study. In one group, the CV-24 point was stimulated by a red-light soft magnetic field laser for 1 min. The second group received a combination of laser stimulation of CV-24 and acupressure PC-6. The last group was considered as the placebo

group. The GSI and GPI were recorded during dental impression taking procedure. The average improvement between the GSI and GPI was 58.9% before and after the laser stimulation in the second group and 37.9% in the first one. They claimed that both acupuncture points CV-24 and PC-6 had a significant role in controlling the gag reflex.¹⁴

In another study by Bilello and Fregapane, both CV-24 and PC-6 were used to control the gag reflex. They enrolled 20 individuals who had severe gag reflex and needed maxillary and mandibular impression taking. The first impressions of both jaws were taken without prior acupuncture. However the second impressions were prepared after acupuncture. The VAS revealed that the patients were more relief after acupuncture.

Previous studies have presented that CV 24 and PC 6 were effective acupuncture points in patients with gag reflexes. Compared to needle acupuncture, acupressure and laser acupuncture allowed a less painful stimulation, hence acupressure and laser acupuncture were considered in this study. A low-level laser has no known side effects. Laser irradiation on the body can have side effects such as increased pain sensation on the operating area, increased fatigue, drop of blood pressure and vertigo if the site is close to vessels.¹²

Ebadi et al. tried different acupuncture point for controlling the gag reflex during the preparation of maxillary arch impression on 20 individuals. In a study done by Shenmen et al, stomach and throat point, which are located on the ears, were the targets. The results showed that the case group which was subjected to acupuncture of mentioned three points showed about 70% decrease in gag reflex during impression taking. In similar observation, Fiske and Dickinson tried to overcome the gagging reflex by stimulating mentioned ear acupuncture point in 10 patients. They evaluated their gagging severity before acupuncture and stated that 6 patients had severe gagging which made any dental procedures impossible. After acupuncture, the maxillary impression taking was tried, and the outcome was hopeful in 8 of individuals

However, Dundee and McMillan found that the stimulation of PC6 alone was insignificant in preventing postoperative vomiting in children after strabismus surgery, while Schlager et al investigated the effect of 670 nm low-level lasers on the acupuncture point PC6 in children with vomiting after strabismus surgery and found that laser stimulation of acupuncture point PC6 reduced the incidence of vomiting.¹⁴

TABLE 1 REVIEWED ARTICLES

Authors	Year	Indexed	Acupuncture point	Number of Participants	Groups	Clinical significant
Lu et al.	2000	Pub Med	PC-6	-	Case Control	Stimulation of that point has positive impact on gagging
Rosted et al.	2006	PubMed	CV-24	37	Case Control	acupuncture of point CV-24 is an effective method of controlling severe gagging
Fiske and Dickinson	2001	PubMed	Shenmen, stomach and throat points on ear	10	Taking impression once before acupuncture and lately with acupuncture	The gagging control was successful in 8 of 10 individuals
Zotelli et al	2014	PubMed	PC-6	33	Case Control	Acupuncture PC-6 was effective for controlling gagging during the maxillary impression-taking procedure. Patients' expectation did not influence the results
Bilello and Fregapane	2014	PubMed	Cv-24 PC-6	20	Taking impression once before acupuncture and lately with acupuncture	Acupuncture might be helpful for preventing gag reflex, and justifies further study
Sari and Sari	2010	PubMed	CV-24 PC-6	45	Laser stimulation of CV-24 Laser stimulation of Cv-24+ and acupuncture of Pc-6 Control	Both acupuncture sites were effective
Ebadi et al	2014	Google Scholar	Shenmen, stomach and throat points on ear	20	Sham Case Control	Acupuncture that points resulted in lower gag reflex
Rahshenas et al	2014	Google Scholar	PC-6	75	Control Pulpation Pulpation and pressing	Both groups 2 and 3 showed better effects on controlling gag reflex

CONCLUSION

Generally, the studies on the efficacy of acupuncture science on controlling gag reflex are not vast enough to provide a reliable and comprehensive conclusion. Though CV-24 and PC-6, seems to provide a remarkable reduction on gag reflex and it might be suggested for practitioner to consider these points during gagging. Especially in pediatric dental patients where cooperation is of prime consideration, laser acupuncture plays a major role in reducing the anxiety and also acts as a distraction method. More comprehensive studies have to be done in this field to have a thorough authorization of this technique.

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