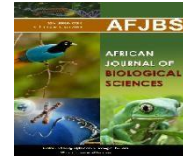


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Effect of microcurrent electrical stimulation on acupoints to control gag reflex in patients receiving prosthodontic treatment

¹Dr. Swapnil. B. Shankargouda, ²Dr. Mallikarjun. H.Doddamani, ³Dr. Ramya Vinayagam, ⁴Dr. Manjiri Salkar, ⁵Dr. Ramen Haloi, ⁶Dr. Enakshi Mitra

¹Reader, Department of Prosthodontics and Crown and Bridge, KAHER'S Vishwanath Katti Institute of Dental Sciences, Belagavi, Karnataka.

²Reader, Department of Prosthodontics and Crown and Bridge, KAHER'S Vishwanath katti Institute of Dental Sciences Belagavi, Karnataka.

³Professor, Department Of Periodontics, Sree Balaji Dental College and Hospital Chennai.

⁴Associate professor, Department of prosthodontics and crown and bridge, MGV's KBH Dental college and hospital, Nashik.

⁵Reader and Teacher I/C Department of Public Health Dentistry ,Government Dental College, Dibrugarh.

⁶P.G.T, Department of Public Health Dentistry, K.D. Dental College & Hospital, Mathura, U.P.

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ABSTRACT

Background: Acupressure and acupuncture are two complementary medicine therapies that can be used in conjunction with psychological, pharmacological, relaxation, desensitization, and distraction techniques to prevent gag reaction. The present study was conducted to assess effect of microcurrent electrical stimulation on acupoints to control gag reflex in patients receiving prosthodontic treatment.

Materials & Methods: 45 partially edentulous patients with history of gag reflex during the dental impression procedures of both genders. were divided into 3 groups. There were 10 patients in each group. Group I patients underwent electroacupuncture (microcurrent electrical stimulation) using electroacupuncture device on auricular point and group II on Hegus point (Li 4), for 1 minute and group III was placebo group, point Shou San Li (Li 10). The gag severity index and the gag prevention index were used to measure the gag reflex.

Results: Gagging severity index (GSI) in group I was 3.71, in group II was 3.72 and in group III was 3.48. The mean gagging preventive index (GPI) in group I was 1.24, in group II was 1.81 and in group III was 3.26. The difference was significant ($P < 0.05$). Percentage improvement in group I was 65.1%, in group II was 50.4% and in group III was 7.2%. The difference was significant ($P < 0.05$).

Conclusion: An effective adjuvant for treating unpleasant gag reflexes during traditional dental operations is microcurrent electrical stimulation. The results of this study show that microcurrent electrical stimulation at point Hegus and point auricular can effectively reduce the severity of gag reflex, with point Hegus being more effective than point auricular.

Introduction

Gagging is a protective reflex to stop unwanted entry to the mouth and oropharynx. Definitions of gagging appear to fall into two main categories. One group simply describes the anatomical mechanisms of the reflex and may or may not include the neural pathways involved. The other group of definitions describes the physiological reasoning behind the gagging reflex. It is most frequently observed in dentistry during various dental operations, which can be crippling, cause an avoidance tendency, and ultimately lower the standard of

care.¹ There are two possible causes of gag reflex: psychological and somatic. Psychogenic gagging can be brought on by any idea, sound, smell, or sight, while somatic gagging can be brought on by stimulation of the trigger zones surrounding the oropharynx.² The normal, protective gag reflex is not present in everyone. In one study, 26% of young adults and 43% of elderly people failed to exhibit a gag reflex. Whilst abnormal gag reflexes have been seen in some pathological conditions such as motor neurone disease and following head trauma. There are no data giving the prevalence of gagging problems in the general population. After the initial stimulus, gagging is mediated in the brain by a number of cranial centres. The vomiting centre lies in the medulla oblongata and is closely linked to the vasomotor, respiratory, salivatory and vestibular centres. The trigeminal, glossopharyngeal and vagus nerves transmit tactile sensory impulses from receptors around the tongue, mouth and oro-pharynx to the brain. These stimuli may be modulated by impulses received from the olfactory, optic and auditory nerves and by the higher centres (through learned behaviours, emotions and memory). Efferent control of gagging and vomiting is relayed from the brain to the muscles of the oropharynx, tongue and upper gastro-intestinal tract via the trigeminal, facial, vagus and hypoglossal nerves and some spinal sympathetic nerves to the stomach and diaphragm. Under Whitehead and coworkers' categorization of psychosomatic illness, gagging would be designated as a condition influenced by external, environmental events that possess psychological significance.³⁻⁵

Acupressure and acupuncture are two complementary medicine therapies that can be used in conjunction with psychological, pharmacological, relaxation, desensitization, and distraction techniques to prevent gag reaction. Severe gagging can be caused by any contact with an instrument or prior dental experience, which compromises the quality of treatment and ultimately affects the patient's outcome.³ Severe gagging can be easily managed with simple chairside techniques (applying topical anesthetics drugs, table salt, nitrous oxide, and distracting the patient during treatment). The literature provides a clear explanation of acupuncture as a technique for preventing gag reflex. It entails applying pressure, vacuum, electrical, laser, or other stimuli to particular bodily areas or sites in order to prevent disease, treat it, or preserve health.⁴ While electroacupuncture has a place in dentistry, traditional treatments still have a place. Giving care will be simpler if this overactive response is under control.⁵

The present study was conducted to assess effect of microcurrent electrical stimulation on acupoints to control gag reflex in patients receiving prosthodontic treatment.

Materials & Methods

The present study was conducted on 45 partially edentulous patients with history of gag reflex during the dental impression procedures of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Patients were divided into 3 groups. There were 10 patients in each group. Group I patients underwent electroacupuncture (microcurrent electrical stimulation) using electroacupuncture device on auricular point and group II on Hegus point (Li 4), for 1 minute and group III was placebo group, point Shou San Li (Li 10). The gag severity index and the gag prevention index were used to measure the gag reflex. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I: Assessment of gagging severity index and gagging preventive index

Index	Group I	Group II	Group III	P value
GSI	3.71	3.72	3.48	0.91
GPI	1.24	1.81	3.26	0.05

Table I shows that gagging severity index (GSI) in group I was 3.71, in group II was 3.72 and in group III was 3.48. The mean gagging preventive index (GPI) in group I was 1.24, in group II was 1.81 and in group III was 3.26. The difference was significant (P < 0.05).

Graph I: Assessment of gagging severity index and gagging preventive index

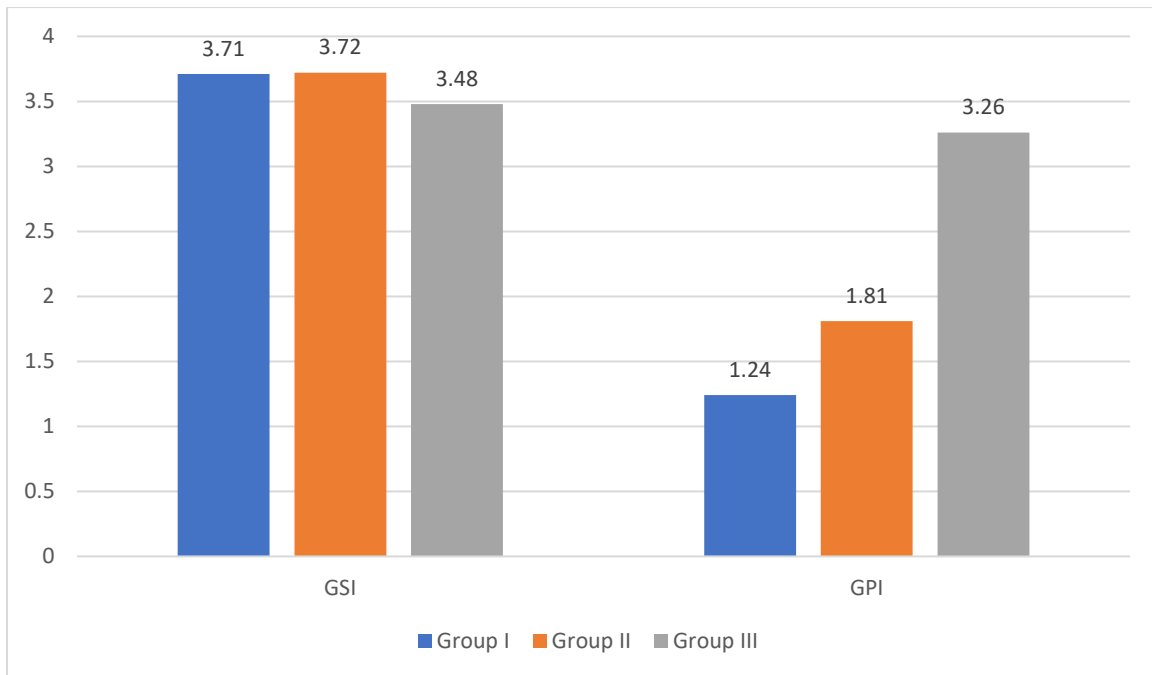
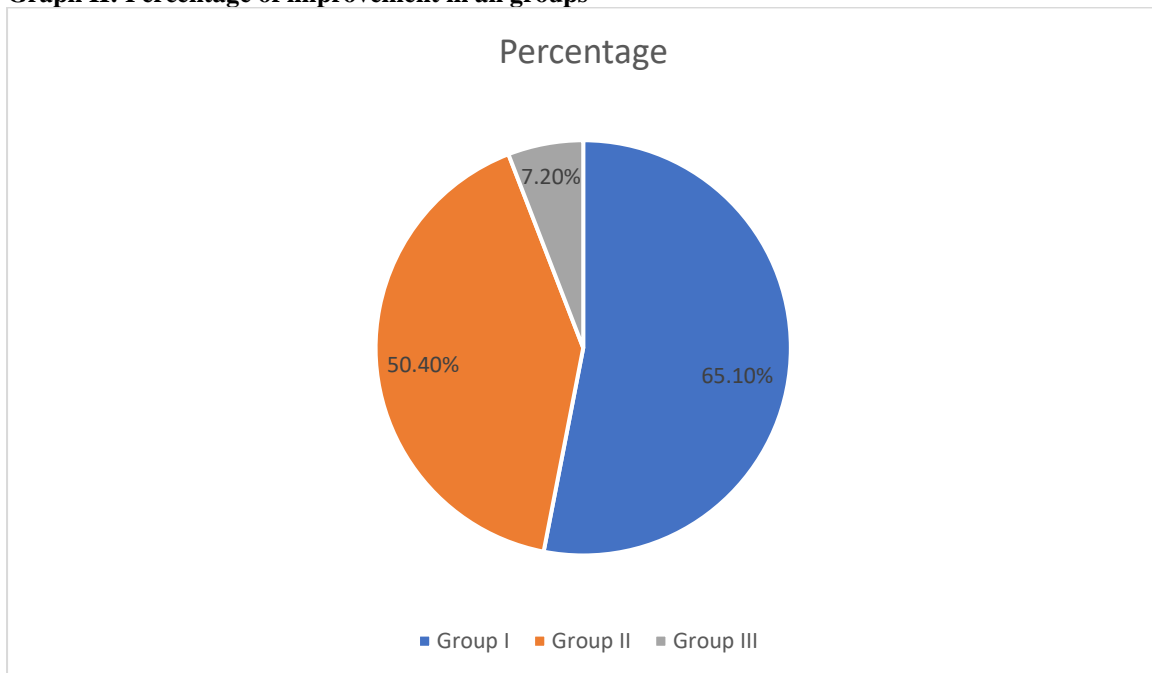


Table II: Percentage of improvement in all groups

Groups	Percentage	P value
Group I	65.1%	0.01
Group II	50.4%	
Group III	7.2%	

Table II, graph I shows that percentage improvement in group I was 65.1%, in group II was 50.4% and in group III was 7.2%. The difference was significant ($P < 0.05$).

Graph II: Percentage of improvement in all groups



Discussion

Microcurrent electrical stimulation (MES) is a therapeutic modality that involves the application of low-level electrical currents to targeted areas of the body for pain relief, tissue healing, and neuromuscular re-education.^{6,7} When applied to acupoints, MES may be used as a non-invasive method to control the gag reflex, particularly in

individuals undergoing dental procedures or medical interventions that trigger gagging sensations.⁸ Microcurrent electrical stimulation applied to specific acupoints can modulate the activity of the nervous system, including the autonomic nervous system, which regulates involuntary reflexes such as the gag reflex.⁹ By delivering low-level electrical impulses to acupoints associated with gag reflex control, MES may help inhibit or suppress the reflex response.¹⁰ The present study was conducted to assess effect of microcurrent electrical stimulation on acupoints to control gag reflex in patients receiving prosthodontic treatment.

We found that gagging severity index (GSI) in group I was 3.71, in group II was 3.72 and in group III was 3.48. The mean gagging preventive index (GPI) in group I was 1.24, in group II was 1.81 and in group III was 3.26. Agrawal et al¹¹ examined if patients may be helped to avoid gag reflex by applying microcurrent electrical stimulation to the auricular and hegus acupoints. Thirty patients, ten in each of the three groups A, B, or C, were assigned at random. Group C served as the placebo group, and Group A and Group B received electroacupuncture (microcurrent electrical stimulation) for one minute on the Hegus point (Li 4) and the auricular point, respectively (Li 10). The gag reflex was measured in two stages using the gag severity index and the gag prevention index. It was discovered that Points A and B considerably lessened the intensity of the gag reaction. Point C showed negligible outcomes. Furthermore, Point B (Hegus [Li4]) is more effective than Point A (auricular) in controlling the gag reflex in patients within the set age group of 20–70 years of age.

We found that percentage improvement in group I was 65.1%, in group II was 50.4% and in group III was 7.2%. Pol et al¹² in their study forty-five patients were divided into three groups (Groups A, B, and C) of fifteen patients in each group. GR assessment was estimated by using the Gagging Severity Index (GSI). Group A underwent a red-light soft magnetic field laser stimulation (electroacupuncture) on conception vessel 24 (CV 24) for one minute (min). Group B underwent a combination of laser acupuncture of CV 24 and acupressure on pericardium 6 (PC 6). Group C, formed the placebo group. During laser acupuncture and acupressure, a second impression was taken and the Gagging Prevention Index (GPI) was evaluated. Both the GSI and the GPI were recorded at three different stages of the dental impression making procedure, stage I- an empty impression tray, stage II- with a loaded tray, stage- III ability to keep the impression in the mouth until the alginate sets. A significant decrease in GPI values as compared to GSI values, was observed after the laser acupuncture in Group A and B ($p < 0.05$). The average improvement between the GSI and the GPI scores before and during laser acupuncture and acupressure in Group B was 53.6 %, in Group A was 34.2 % and in Group C was 2.81 %. When the mean values of GSI and GPI scores of the empty tray, loaded tray, alginate set were compared among the three groups A, B, C before and during laser acupuncture and acupressure.

The shortcoming of the study is small sample size.

Conclusion

Authors found that an effective adjuvant for treating unpleasant gag reflexes during traditional dental operations is microcurrent electrical stimulation. The results of this study showed that microcurrent electrical stimulation at point Hegus and point auricular can effectively reduce the severity of gag reflex, with point Hegus being more effective than point auricular.

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