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## Review Article

# A literature review on various etiological factors and management of gag reflex in prosthodontics

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## ABSTRACT

Gagging is a normal physiological reflex action to restrict the entry of any foreign body through the oral cavity. Gagging is a physiological process, but sometimes it is precipitated by some other factors like while making impression of the dentulous or edentulous patient, patient may gag by the sensation of touch of impression tray or by the impression material, sometimes gag precipitates by just watching other person gagging during any dental procedure.

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## 1. Introduction

In routine dental practice, most of the clinicians encounter the problems of severe sensitive reflex of the soft palate, which may precipitates the gagging and that's the only reasons these patients would not been able to bear any foreign body in terms of impression material or even impression tray in the oral cavity. The awkward situation arises to the dentist or to the patient itself when the process of gagging results in sudden vomiting or act of vomiting on the same moment when the dentist is doing some procedure.

The autonomic nervous system of the parasympathetic division is primarily responsible for the gag reflex and it is a defensive mechanism to guard the entry of any foreign body in the upper respiratory tract as well as in the food pipe that might block them. Gagging is a normal physiological process, however it can be acquired by watching some

other person gagging during the dental procedure or gagging can be precipitated by some acoustic stimuli, or it can be stimulated by some pungent stimuli and at the end it can be psychic.<sup>1,2</sup>

### 1.1. Etiology of The Gagging<sup>3-5</sup>

Various etiological factors associated for gagging are in the form of local factors, social cause, medical conditions, psychological factors, factors associated with the usage of prosthesis, iatrogenic factors. Out of all the factors the most common factors for the process of gagging is age, gagging is commonly seen in old age patient as they have poor muscular control when compared to the adult patient. Local factors associated with the process of gagging are, any nasal obstruction, deviated nasal septum, polyps of the nasal, congestion of the nose, sinusitis. Factors that are associated with the prosthesis are the extension of the denture is over or under extension of the denture, poor retention of the prosthesis may lead to gag reflex,

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if the surface of the denture is not properly finished, and no proper occlusion of the denture. Medical conditions associated with the precipitation of the gag reflex are, chronic gastritis, paterson's dysplasia, peptic ulcers, partial gastrectomy. Social causes are heavy smoking, coughing, chronic alcoholic. Psychological factors associated with the process of gagging are stress, anxiety, fear, eating disorder, neuroticism. And lastly iatrogenic factors associated with the process of gagging are instrumentation during any dental procedure, water or from the suction tube, local anesthesia, while taking radiograph in the oral cavity.<sup>3-5</sup>

## 2. Neurophysiology of The Gag Reflex

In the neurophysiology of gag reflex, signals are transmitted to the nervous center of vomiting from the afferent pathways and then to the efferent path. The sensation of vomiting are recognized by three different types of receptors which are orofacial receptors, digestive receptors, and blood flow receptors.

### 3. Oro Facial Receptors

They are situated at the posterior pharynx region and this area is rich in nociceptors; these receptors are responsible for taste sensation and can also trigger the gag reflex. These receptors are interconnected with the labyrinth receptors that may trigger the process of gagging if the position of the patient is changed. In the same way, some other receptors like visual, auditory and olfactory receptors are also responsible for the act of gagging.

#### 3.1. Digestive receptors

The combination of both the receptors i.e. orofacial receptors and digestive receptors together forms the chemo receptors. The afferent pathways from the digestive tract mainly communicates through the vagus nerve which reaches at the solitary nucleus, and to which the afferences of glossopharyngeal nerve also get converged and as a whole become responsible for the gag reflex.

#### 3.2. Blood flow receptor

As such, there are no receptor present at the blood flow level. Drug toxicity or uremia which are pathological humoral alteration may act on bulbar center of the vomiting and can induce the gag reflex. Similarly, hormonal alteration which are inherent to the pregnancy also act through the blood flow and may result in the act of vomiting.

## 4. Severity Index of The Gagging

Very mild: — the process of gagging can be controlled by the patient itself, no other person or thing is required to stop the gagging process.

Mild: — the process of gagging can be controlled by the

patient himself or with the help of the dentist by applying some simple controllable measures.

Moderate: — some of the treatment options are not tolerated by the patient.

Severe: — some of the treatment procedures are impossible to perform, i.e. the gagging is that much severe and cannot be controlled by the patient or by the dentist.

Very severe: — not a single or even a simple procedure can be performed over the patient.

## 5. Index of the Prevention of The Gagging

When the gag reflex is obtunded: treatment can be successful.

When the gag reflex is controlled partially: — any type of treatment modality or every treatment is possible over the patient.

When the gag reflex is partially controlled but the act of gagging is frequent: -simple treatment procedure can be done over the patient.

When the gag reflex is inadequately controlled: — even the simple treatment procedure is unable to perform over the patient.

Severe gag reflex: — not even the simple treatment can be possible over the patient.

## 6. Management of the Gagging<sup>6-8</sup>

First one is the psychological management of the gagging which includes proper communication like ask the patient to relax, and sit in the comfortable position; stop any dental treatment procedure if it is going on. Then the distraction of the patient from the stimuli which is responsible for the act of gagging can be done; so desensitization of the patient can be done, by telling each and every step to the patient. Psychological modification of the patient can be done by letting the patient know the benefits of the treatment procedure and let them show the other patient, how they are undergoing the procedure calmly. In some extreme cases of gagging conscious sedation can also be an option.

Second step is the therapeutic management of the patient, which includes administration of antihistamines, sedatives, analgesics, anticholinergic drugs to the patient. Application of topical local anesthetic agent can also be used in the soft palate region to reduce the sensation in the soft palate region and ultimately reduces the gagging sensation. Acupuncture is the new in entity to distract the patient mind for gagging. While making dental impression, if the patient gags then there are some stress relieving points in the human body which can be pressed to relieve the stress or anxiety known as acupuncture points. They are situated at the region of glabella, the pinna of the ear and the point between the index finger and the thumb, these points should be pressed and the act of gagging can be reduced.<sup>6-8</sup>

Third step is the prosthodontic management of the gagging. In prosthodontics, management of the gagging is the most common employed technique and is called as the singers marble technique. This technique is employed over those patients who are unable to wear a denture base in the mouth even for fractions of seconds and start gagging as the denture base be inserted in the mouth; and this procedure is basically for these patients so as to get habitual with the complete denture without the act of gagging. This techniques requires seven different steps to get the patient habitual with the complete denture. In the first step, no oral examination is done to the patient, only few colored marbles been shown to the patient in the tray and ask the patient to place marble according to his comfort ability for a week, this shows the patient that by placing the foreign body in the mouth doesn't cause any harm. Patient is asked to place marble in the oral cavity for some time in a week. In the second step, when the patient becomes comfortable with the marbles in the mouth and can swallow the saliva without any problem, he is motivated and made assured that he will be able to wear the denture.

In the third step, local topical anesthetic solution can be applied over the cheeks, tongue and on the soft plate region and the primary impression is made with the modeling compound, and for the secondary impression special trays fabricated should not be polished well, it should remain a bit rough, as the tongue tends to slip over the polished surface of the special trays. In the fourth step, lower denture base was inserted in the patient mouth and the patient is asked to place three marbles in the mouth along with the denture base and a spot will be made on the denture base with cold cure resin so that the tongue should rest on right position. In the fifth visit, maxillary denture base now also inserted in the patient mouth along with the mandibular denture base for a week and the exercise of the marbles are discontinued at this step. In the sixth step, the patient is well-trained for wearing both the denture bases, occlusal rims are inserted in the patient mouth and jaw relations are made after that patient is instructed to wear the maxillary and the mandibular denture bases till the fabrication of the complete denture. In the seventh step, the processed lower denture is inserted in the oral cavity with the upper denture base and a bead should be there in the lower denture to maintain the proper tongue position.

Another prosthodontic management of the gag reflex is the reduction of the palatal coverage which is over extended in the palatal region. This should reduce the gag reflex.<sup>9-11</sup>

## 7. Conclusion

Gagging is a normal physiological reflex action in order to prevent the entry of any foreign material into the body. Normal gag reflex can be treatable with all the measures taken. Hyper active gag reflex patient need some training to

get acquired with the prosthesis. A clinician should have a thorough knowledge of all the measures to reduce the act of gag reflex.

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None.

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