

Gag Reflex: A Comparative Study Among Different Prosthodontic Treatment Modalities

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Abstract

Background: In routine prosthodontic treatment, prosthodontists may encounter patients having increased oral sensitivity to foreign objects, resulting in gagging. The present study was done to survey the patients with gag reflex needing prosthetic treatment. **Materials and methods:** This descriptive epidemiological investigation was conducted in the Department of Prosthodontics at College of Dentistry, Jazan in the month of March and April 2017. The patients undergoing prosthodontic treatment for replacement of teeth were selected for the study. Patients who came for the treatment of any type of prosthesis [Removable partial denture (RPD), Fixed partial denture (FPD) and / or Complete denture (CD)] were included in the study. A self-structured questionnaire pretested through pilot study was designed to verify the prevalence of gag reflex. Data was analyzed using SPSS version 16.0. Descriptive statistics were obtained and frequency distributions were calculated. Chi-square test was done to compare the prevalence of gag reflex according to gender, type of appliances and health condition. Statistical significance for all tests was accepted at $p < 0.05$. **Results:** The study was conducted among 112 participants to assess the frequency of gag reflex and it was found that 49.1% of the subjects had problems of gag reflex. All the patients were distributed with different types of prosthodontic appliances such as; Fixed Partial Denture (FPD) (54.5%), Removable Partial Denture (RPD) (30.4%), Complete Denture (CD) (13.4%), and combination of (RPD and FPD) (1.8%). According to the type of appliance significant results were obtained, patients with FPD, had superior number of gag reflex cases [25(22.3%)] followed by RPD [18(16.1%)] and CD [12(10.7%)]. It was also found that female participants had higher cases of gagging (29.5%) as compared to their male counterparts (19.6%). According to the severity of gag reflex, the overall frequency of mild cases was mostly noticed (21.4%). **Conclusion:** From the study it was shown that patients undergoing fixed partial denture treatment are having more frequency of gag reflex, as compared to other groups.

Key Words: Gagging, Prosthodontics, Prosthetic treatment, Replacement of teeth

Introduction

Gagging is a natural process to safeguard upper respiratory tract from obstruction by the foreign body. But, it can also be an acquired reflex which is conditioned by various stimuli such as visual, acoustic, olfactory, psychic, toxic or chemical transmitted through the cerebrospinal liquid or the blood flow. Because of gagging, patients usually complains of unpleasant feeling, nausea or vomiting during the dental procedures creating a difficult situation to manage [1,2].

The gag reflex in normal situation is a self-protective response for the survival and is controlled largely by parasympathetic part of the autonomic nervous system. Five regions in the oral cavity have been recognized as the major trigger zones for commencing the gag reflex such as base of the tongue, palate, fauces, uvula and posterior pharyngeal wall [3,4]. Gag reflex change the shape of the pharynx and the various structures present in the pharynx to eject foreign bodies from mouth and pharynx and prevents further progression from entering the trachea [5].

Various dental procedures like making of maxillary and mandibular impressions, preparation of cavities, marking of the posterior vibrating line for partial or complete dentures, crowns or root canal treatment for posterior teeth, taking intra-oral radiographs especially for the posterior teeth and extraction of third molars can cause exaggerated gagging reflex [6]. The management of patients having severe gagging can be challenge and sometimes frustrating experience for dentists [6].

The present study was done to survey the patients with gagging undergoing prosthodontic treatment. The aim of the study was to compare the prevalence of gag reflex according to gender, type of prosthesis and health condition in patients undergoing prosthodontic treatment.

Materials and Methods

Study area

This descriptive epidemiological investigation was conducted in the Department of Prosthodontics at College of Dentistry, Jazan in the month of March and April 2017. The patients undergoing prosthodontic treatment for replacement of teeth were selected for the study. The questionnaire was distributed to the patients as and when they came for the treatment and after 10 minutes collected by the researcher.

Criteria of selection

Patients who came for the treatment of any type of prosthesis [Removable partial denture (RPD), fixed partial denture (FPD) and / or Complete denture (CD)] were included in the study. Detailed case histories of the patient were recorded. Before the onset of the study, an official permission was taken from the ethical committee of the Institute and a written informed consent was obtained from all the participants of the study. Only those patients willing to participate in the study were considered.

Study population

The final sample of the study was 112 patients, data including 44 (males) and 68 (females). The age of the patients ranged from 29 to 68 years. The study sample was assorted into two main groups: the first one represented by subjects who did not suffer from gag reflex with any type of prosthetic treatment, while the second group represented those patients who had suffered from gag reflex with all type of prosthetic treatment.

Investigation

A self-structured questionnaire pretested through pilot study was designed to verify the prevalence of gag reflex. The patients were also asked about the severity of the gag reflex, history of any medically compromised condition, any medical treatment to control gag reflex and response to the medical treatment.

The severity of gag reflex problem for each study subject depends on his/her own remark. This is because gagging condition cannot be determined by any scoring system. Therefore, if the patient answers that he/she was suffering from gag reflex rarely, it means mild type of reflex; if the patient mentioned about this reflex after long time of denture insertion, it means moderate type of reflex; but if the gag reflex happens instantly during and after denture insertion (direct reaction), then it was categorized as severe type of reflex.

Data analysis

Data was analyzed using SPSS version 16.0. Descriptive statistics were obtained and frequency distributions were calculated. Chi-square test was done to compare the prevalence of gag reflex according to gender, type of appliances and health condition. Statistical significance for all tests was accepted at $p < 0.05$.

Results

The study was conducted among 112 participants to assess the frequency of gag reflex.

Table 1. Showing response to the questionnaire.

S. no	Questionnaire	Response (%)	
		Yes	No
1	Are the patients having problem of gag reflex?	49.10%	50.90%
2	Are the patients having any medically compromised condition?	34.80%	65.20%
3	Is any medical treatment given to the gag reflex patient for controlling gagging?	0.00%	100%
4	Response to the medical treatment in severe gagging patient?	0.00%	100%

It was found that 49.1% of the subjects had problems of gag reflex. None of the participant had taken any medical

treatment for gagging and therefore no response was seen to the condition of gag reflex as illustrated in *Table 1*.

All the patients distributed with different types of prosthodontic appliances were as; Fixed Partial Denture (FPD) (54.5%), Removable Partial Denture (RPD) (30.4%), Complete Denture (CD) (13.4%), and combination of (RPD and FPD) (1.8%) as shown in *Table 2*. According to the type of appliance, significant results were obtained. Patients with FPD had superior number of gag reflex cases [25(22.3%)] followed by RPD [18(16.1%)] and CD [12(10.7%)]. However none of patients with both RPD and FPD had any type of gag reflex as stated in *Table 2*. The difference between gag reflexes in various types of prosthetic appliance was found to be statistically significant (Chi-Square test, $p < 0.05$).

It was also found that female participants had higher cases of gagging (60.0%) as compared to their male counterparts (40.0%) (*Table 3*), but the difference was not statistically significant (Chi-Square test, $p > 0.05$).

Table 2. Prevalence of Gag reflex according to different types of prosthodontic appliances.

Type of Appliance	Gag Reflex		Total	p-value
	Absent	Present		
RPD	16(14.3%)	18(16.1%)	34(30.4%)	
FPD	36(32.1%)	25(22.3%)	61(54.5%)	
CD	3(2.7%)	12(10.7%)	15(13.4%)	0.024*
RPD & FPD	2(1.8%)	0(0.0%)	2(1.8%)	

Table 3. Prevalence of Gag reflex according to gender.

Gender	Gag Reflex		Total	p-value
	Absent	Present		
Male	22(38.59%)	22(40.0)	44(39.3%)	
Female	35(61.40%)	33(60.0%)	68(60.7%)	0.516**

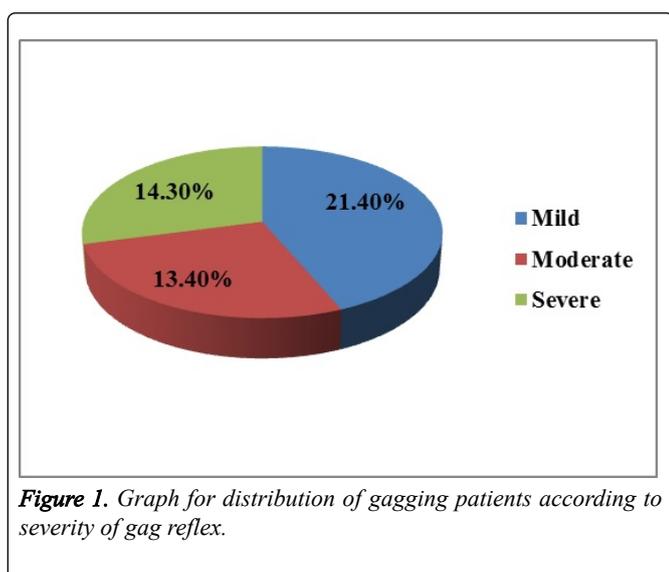
The study further evaluated gagging according to the general health condition of the patient and it was observed that healthy patients (40(35.7%)) has elevated rate of gag reflexes compared to medically compromised patients (15(13.4%)) as depicted in *Table 4*.

Table 4. Prevalence of Gag reflex according to health condition.

Health condition	Gag Reflex		Total	p-value
	Absent	Present		
Healthy	33(29.5%)	40(35.7%)	73(65.2%)	
Medically compromised	24(21.4%)	15(13.4%)	39(34.8%)	0.073**

According to the severity of gag reflex, the overall frequency was mostly noticed in mild cases (21.4%), whereas the moderate (13.4%) and severe (14.3%) conditions were

almost equally distributed in the study sample as illustrated in Graph (Figure 1).



Discussion

The present study was done to compare the prevalence of gag reflex according to gender, type of prosthesis and health condition in patients undergoing prosthodontic treatment.

Gagging can be a great distress to the patient and the attitude of the clinician towards the patient may influence the outcome of treatment. The patient should be informed of the intraoral examination and procedures prior to the treatment and the clinician should proceed only when consent has been given [7].

The management of gag reflex rest on treatment of the cause and not merely symptomatic treatment. Thorough clinical examination, recording of proper medical history and conversation with the patient can be the key factors in understanding the etiology of the gag reflex. The dental practitioner needs to define if the patient's problem is related to organic disturbances, iatrogenic factors, anatomic or psychological factors. It is important to recognize whether, single or multiple factors are causing the problem [8].

In our study 49.1% patients were having gag reflex while performing the dental procedures. Similar findings were seen in the study by Kassab NH et al. [9], where 43 out of 200 patients presented with gagging. Ramsay et al. [10] suggested that participants with bad prior dental experiences will approach dental treatment with bias, and will behave the same during similar episodes in the future.

A patient wearing complete denture can develop gag problem as a result of various causes; some of them may be related to denture itself, while others can be psychogenic causes like refusing to swallow the saliva for the reason of fear that the denture will dislodge. As a result of improper swallowing, saliva would accumulate and triggers the gagging reflex [9]. However, in removable partial dentures; the denture-associated mucosal irritation in the oral cavity during chewing can also cause loss of stability and adaptation of the dentures, leading to gagging. As a result, the adaptation and retention of the dentures can be lost, and the denture detaches

from the alveolar ridge, which may cause gagging [10]. In the present study, patients with FPD had more gag reflex than (22.3%) than RPD (16.1) and CD (10.7%).

Also, in the present study, even though females (60.0%) were found to have more gag reflex as compared to males, it was not statistically significant. This finding was in accordance to the findings by Kassab NH et al. [9], where 60.25% patients were females having gag reflex. Another study by Mohammed [11] reported that females showed a higher incidence of gag reflex than males and attributed this result to women having relatively smaller jaws and being psychologically more sensitive when compared with males thus leading to an exaggerated gag reflex.

Several studies have suggested behavioral techniques (hypnosis relaxation & reading) and distraction technique to temporarily divert patient's attention during short dental procedures [12,13]. However in the present study, only distraction technique was used and none of the participant had taken any medical treatment for gagging.

Conclusion

From the present study it can be concluded that gag reflex presents as a common problem during the prosthodontic treatment. The management of patients with gag reflex includes detailed history of patient which will enable the clinician to gauge the severity of the problem to make appropriate decisions and treatment options according to patient's requirements.

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