

Effect of *Elaeagnus Angustifolia* Lozenge on Gag Reflex in Dental Patients

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Abstract

Background and Aim: Gag reflex is one of the most common problems in dental treatment. All researches performed to reduce or eliminate this reflex were not effective or were time-consuming. The aim of this study was to evaluate the use of *Elaeagnus Angustifolia* lozenge in controlling gag reflex during dental treatment.

Materials and Methods: This study was a randomized double blind controlled trial with convenient sampling on 84 patients that were candidates for radiographic procedures in the School of Dentistry, Isfahan University of Medical Sciences. The cases were randomly divided into two groups of case and control. The case group used *Elaeagnus Angustifolia* L extracts and the control group used placebo. Fruit extract was formed into lozenge. Before and after intervention, the gag reflex was evaluated by stimulation of the soft palate and pharyngeal tonsils. Data analysis and comparison was performed with SPSS 11 software and Chi-square, McNamara and t tests.

Results: The gag reflex significantly decreased in the soft palate region ($p < 0.001$) and pharyngeal tonsils ($p < 0.001$) in the intervention group. In the placebo group, decrease of gag reflex was not significant in any of these locations ($p = 0.9$). The decrease in gag reflex in the soft palate and the pharyngeal tonsils in the case and control groups before and after the intervention showed statistically significant differences ($P < 0.01$).

Conclusion: *Elaeagnus Angustifolia* L. extracts seem to be an effective method to control gag reflex during dental treatment. It may be a confident method to use on dental procedures, especially radiographic procedures.

Key Words: *Elaeagnus angustifolia*, Gag reflex, Lozenge

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Introduction

Gag reflex is an involuntary defense mechanism against tactile stimulation of the pharynx and throat. The ninth and tenth cerebral nerves have an important role in this reflex. Stimulation of the pharynx and the tonsils prevents breathing leading to contraction of the chest, abdominal, oral and pharyngeal muscles inducing the gag reflex. To decrease this reflex, one has to eliminate or de-

crease the stimulants [1-2]. Many of dental procedures such as intra-oral radiographies, examination of the pharynx and throat, endodontic and prosthetic procedures such as placing a rubber dam for the posterior teeth lead to gag reflex stimulation [3]. It has been mentioned in the literature that gag reflex occurs in 44% of wearing of dentures showing considerable importance compared to other situations [3-4]. Gag reflex in dental procedures leads

to decrease in the patient's cooperation and diminishes the quality of treatment and may also cause discontinuation of the treatment process, waste of time, finance and patient dissatisfaction. There have been many different suggestions for this problem, but none have been without complications and acceptable for the patient [3,5]. Rosted et al. have showed that acupuncture may be used successfully with few complications in the mouldering procedure of the upper jaw with alginate [6]. Using salt has been introduced as a good way to control the gag reflex. Salt stimulates the taste buds in the anterior part of the tongue subsequently activating the chorda tympani nerve finally leading to inactivation of the gag reflex [7]. Local anesthetic drugs such as lidocaine as spray or infiltration have been suggested for this matter in the literature. It has been stated that drugs that anesthetize the irritable mucous of the posterior part of the oral cavity, also influence the gag reflex [8]. There are also herbal drugs that have local anesthetic properties. It has been demonstrated in the literature that tannin in herbal drugs has an anesthetic function on the mucosa of the oral cavity [9]. Tannin or acid tannic in herbal drugs is used widely in dentistry. For example tannin is highly effective in the treatment of oral aphthous [10]. *Elaeagnus Angustifolia* is a small tree with 5-6 cm sized thin and spiky leaves. The fruit is a bit sweet with large amounts of acid maleic, calcium malate and high amounts of acid ascorbic and acid butyric used to treat Scurvey disease [11]. The muscle-relaxant effect of this substance is similar to 1 mg/kg diazepam which has been proved in mice [12]. It has high levels of tannin which makes it a local anesthetic for oral aphthous and also pemphigus ulcers [13]. The objective of this study was to evaluate the effect of *Elaeagnus Angustifolia* (tannin) on the gag reflex.

Materials and Methods

This was an experimental study that was a double blind randomized controlled trial. Simple non-probability sampling was performed. The samples were chosen from patients admitted to the radiology department of the dentistry school. Eighty-four

patients were divided into two equal case and control groups. Before the intervention, written informed consent was obtained from the patients according to Helsinki's declaration. Patients who had any type of central or peripheral nervous system disorder and an oral lesion were excluded. Therefore, the main inclusion criteria was high cooperation and a standard written informed consent. After this stage, demographic data (such as age and gender) were recorded in the data sheet. The patients' names were written on paper and were put in a sac. Afterwards, the names were randomly brought out and grouped into groups 1 and 2. Not until after analysis was it clear that which group had received drug or placebo. Neither the drug nor the intervention caused any problem for the patient. The project with the ethics code 387082 was approved by the research deputy of Isfahan university of medical sciences.

First, 100 mg sugar was solved in 1 liter water to make a saturated solution. Under heat the consistency of the solution reached the state of being stretched up to 10 cm. *Elaeagnus Angustifolia* was grinded and heated till it was concentrated. The saturated sugar solution and the heated concentrated *Elaeagnus Angustifolia* were mixed (80 mg fruit concentrate and 100 ml syrup) and were poured into the same mold to make 1 mg tablets. After getting cold, all the lozenges were coded and packed. Placebo was made of water and sugar. These two tablets (placebo and drug) were completely made similar in shape and color and were used as mentioned [14]. First the intensity of gag reflex was evaluated by a tongue depressor and the results were recorded as severe, moderate, mild and absent in the data sheet (Table 1). After evaluation of the gag reflex, one lozenge or placebo which was coded was given to each patient by a third person. The type of blinding in this study was double-blindness in which the code of the drug was undefined for the dentist. Neither the patient nor the doctor knew what the drug was. The patients sucked the lozenges in their mouth till it was completely solved. After 5 minutes, the patient felt senselessness in the soft palate and pharyngeal ton-

sil. After intervention with the main drug and placebo, the patient was evaluated regarding the intensity and degree of gag reflex in the soft palate and pharyngeal tonsils by one examiner and the final results were recorded. After the data were entered in SPSS 11, Chi-square, t test and McNemar tests were used for analysis.

Results

According to Chi-square test, the groups were similar regarding gender. Based on t test, the control and case groups were normal regarding age distribution and there was no significant difference between the groups statistically. The patients' mean age was 24.6 ± 0.8 years. All 84 patients had an active gag reflex before using the drug. The severity of gag reflex before the intervention did not show

any significant difference statistically ($p=0.9$). The change in the gag reflex in the soft palate and pharyngeal tonsils after the intervention for the control and case groups are demonstrated in Tables 2 and 3. The McNemar test showed that the case group showed significant decrease in both the soft palate and pharyngeal tonsils' gag reflexes ($p<0.001$). In addition, in the control group there was no significant difference in the gag reflex of the soft palate and pharyngeal tonsils ($p=0.9$). In none of the cases the gag reflex increased. Analysis of the data showed a significant difference between the distribution of the gag reflex in the soft palate and pharyngeal tonsils in the case and control groups ($p<0.001$) and the *Elaeagnus Angustifolia* lozenges caused significant decrease in the gag reflex.

Table 1: Criteria for evaluation of gag reflex(12)

Severity of Gag Reflex	Description
Absence	No gag reflex when the high-risk surfaces of the oral cavity such as the soft palate and pharyngeal tonsils were touched by a tongue depressor
Mild	Gag reflex with the contact of the tongue depressor with the high-risk surfaces of the oral cavity such as the soft palate and pharyngeal tonsils
Moderate	Gag reflex occurred when the tongue depressor touched low-risk surfaces of the oral cavity such as the hard palate and the floor of the mouth
Severe	Gag reflex occurred with opening of the mouth or seeing the tongue depressor

Table 2: Criteria for evaluation of gag reflex(12)

Changes in Gag Reflex	ElaeagnusAngustifolia		Placebo	
	prevalence	percent	prevalence	percent
Decrease	40	95.2%	8	19%
No Change	2	4.8%	34	81%
Increase	0	0%	0	0%

Table 3: Change in gag reflex in the pharyngeal tonsils after use of *Elaeagnus Angustifolia* lozenges and placebo

Changes in Gag Reflex	ElaeagnusAngustifolia		Placebo	
	prevalence	percent	prevalence	percent
Decrease	42	100%	6	14.3%
No Change	0	0	3	85.7%
Increase	0	0	0	0

Discussion

There have been many different ways suggested to control the gag reflex [14]. Sari et al. and Rosted et al. have introduced acupuncture to decrease the gag reflex. We have to mention that the patients do not accept this type of treatment and microbial infection of the treated location is a high probability [15-16]. Hypnotherapy and psychotherapy have been reported as other treatment options for this matter, but they are time consuming and need many sessions of going to the psychologist [17-19]. Neumann and Mc Carty have stated some behavior control and mind deviating methods, such as elevating the leg, to control this problem [20]. Some researchers have mentioned analgesic and sedative drugs as appropriate solutions for controlling this reflex. However, there are side effects such as drowsiness, dizziness and loss of memory for sedative drugs such as diazepam and nitrogen oxide (NO) [21-22]. Some other disadvantages for long-acting sedative drugs are that they have long-acting effects; therefore, the patient has to be accompanied by someone when he goes out of the clinic [23-24]. Using herbal extracts for the temporary relief of gag reflex has a faster effect compared to hypnotism and acupuncture, does not need psychotherapy sessions and going to a psychologist apart from the fact that patients tolerate herbal drugs easier. Besides, herbal drugs do not have the side effects of sedatives and NO.

In this study, most of the cases were in the second and third decades of their lives which was similar to most other studies; whilst most dental advice seeking happen in this age period and most of the patients who become deprived from appropriate medical and dental treatments as a result of the gag reflex are exactly in this age range [25]. Two interventional and placebo groups had the same age and gender distribution; while these findings demonstrate correct sampling in the study, they also lead to comparison of the two groups with more confidence. Before the intervention, comparison between the placebo and intervention groups regarding the gag reflex in the soft palate and pharyngeal tonsils demonstrated no significant difference statistically, another point indicating the fact that

sampling was carried out properly leading to higher reliability of this study. This study was a double-blinded randomized clinical trial which according to clinical judgment is of high value.

In the case group, after using the *Elaeagnus Angustifolia* extract there was significant decrease in the gag reflex in the soft palate and pharyngeal tonsils unlike the placebo group that showed no significant difference statistically in none of the soft palate and pharyngeal tonsils.

Conclusion

This study showed that *Elaeagnus Angustifolia* extract significantly decreases the gag reflex in the soft palate and pharyngeal tonsils; therefore, it may be used with confidence in most clinical procedures accordingly.

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