



(REVIEW ARTICLE)



Herbal therapeutics in the management of gag reflex: A literature review

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Abstract

Background: Gag reflex is one of the most common conditions faced in the field of dentistry. It is the involuntary defence mechanism against the tactile stimulation of the pharynx and throat. Gag reflex is caused by the stimulation of tonsils and pharynx inhibits the swallowing of foreign object that leads to contraction of the chest, abdominal, muscles of oral and pharynx. There were cases where gag reflex causes severe limitation to a patient's ability to undergo dental treatment which in turn challenges the dentist for providing a better treatment. There are various techniques available for the management of gag reflex like pharmaceutical intervention like anti-emetic drugs, sedatives, local and general anesthetics, herbal remedies and non-pharmaceutical intervention like behavioral therapies, acupuncture, laser, acupuncture, and prosthetic appliances.

Objectives: To assess the role of natural ingredients in the interventions for the management of gag reflex

Search methods: The literature search was done in electronic databases in PubMed, Scopus, Science Direct, MEDLINE and Google search engine to extract clinical studies on natural ingredients used to control the gag reflex among the population with no time limitation. The included search words were “natural ingredients”, “gag reflux” “Clinical trial,” “Clinical study,” “Blind,” or “review”.

Selection criteria: The reviews and randomised controlled trials (RCTs) involving animals or human using natural ingredients in the intervention to manage gagging that interfered with dental treatment.

Data collection and analysis: Two authors independently collected the data. The review authors independently assessed and overall quality of the evidence.

Conclusions: The evidence obtained from data the quality of the evidence of the outcome were neither satisfactory nor adequate evidence for interventions for managing the gag reflex during dental treatment. This review thrives to do research to improve the therapeutics in the management of gag reflex.

Keywords: Gag reflex; Herbal remedies; Management of gagging; Literature review; Therapeutics; Intervention

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1. Introduction

The gag reflex is a natural defensive and physiological involuntary contraction of the muscles of pharynx, trachea and larynx in response to stimuli, it can be classified as both conditioned stimuli and unconditioned stimuli. The mechanoreceptors caused in superior laryngeal nerves will be projected to the parasympathetic division of autonomic nervous system of the nucleus tractus solitarius [1, 2].

There are two groups of causative factors for gagging reflex that is commonly observed they are

- Somatogenic group – anatomical, iatrogenic causes, local causes, systemic causes
- Psychogenic group – psychological causes like operant and classical conditioning [3].

Types of Local dental factors which acts as the stimuli for gagging during dental procedures.

- Acoustic stimuli, caused due to the noise of rotary instruments and the suction apparatus.
- Olfactory/taste stimuli, the odour or taste of dental materials used for the procedure might induce gagging
- Visual stimuli, the mere sight of working atmosphere like instruments, materials or dental set-up triggers gag reflex.
- Mechanical stimuli, caused due to dental instrumentation, suction used, cotton and gauze used for isolation and materials directly stimulating the trigger zones (3). Mechanical stimuli might be due to the overextended denture itself or fear for dislodgement of dentures may cause improper swallowing of saliva which results in saliva accumulation which turns out to be a common triggering factor.
- Psychic stimuli, may be due the pre-existing psychological problems or might be initiated by fear and anxiety of the patient from the previous unpleasant experience.

Gag reflex is said to be a natural phenomenon, however when exaggerated due to the external stimuli it becomes the hindrance to dental treatment (4). When the dental procedures goes to the extent of the second molars like impression making, recording posterior palatal seal for complete dentures, tooth preparation and endodontic treatment, extraction of third molars, and taking intraoral radiographs for the posterior teeth (5). A self-reported gagging study reported 8.2% prevalence among dental patients (6). During denture try-in sessions, the incidence of gagging was reported to be 44% compared to other situations (7, 8). Studies reported that gagging-related problems account for 20% of dental avoidance (9)

1.1. Description of the intervention

The gag reflex has various strategies to manage either by pharmacological and non-pharmacological techniques.

Pharmacological interventions: Pharmacological agents used to manage gagging act peripherally or centrally. Peripherally-acting agents are topical and local anaesthetics. Metoclopramide is a drug that treats nausea and vomiting. This drug acts on the central and peripheral nervous system and blocks the dopamine 2 receptors in the trigger zones and also stimulates the acetylcholine. Centrally-acting agents are categorised as antihistamines, sedatives, tranquillisers, parasympatholytics, and central nervous system depressants.

Non-pharmacological interventions Non-pharmacological interventions include behavioural modification and other interventions including acupuncture, transcutaneous electric nerve stimulation (TENS), using salt on the tip of the tongue, prosthetic devices, laser stimulation, and ear plug technique (7,10,11). Some combination therapies like hypnopuncture were also tried (12). Laser stimulation: red light or magnetic field laser stimulation of the soft palate has been used to reduce the sensitivity of the soft palate (13).

Objectives

To assess the role of natural ingredients in the interventions for the management of gagging in people undergoing dental treatment.

2. Search methodology for identification of studies

Electronic searches conducted in the following databases for reviews, randomised controlled trials and controlled clinical trials. There were no language, publication year or publication status restrictions. Other language data were

translated for data collection. Cochrane Library, MEDLINE Ovid, EBSCO, MEDLINE, google search engine. From the obtained data the reference lists were used to identify any further additional references.

2.1. Selection criteria

We included reviews and randomised controlled trials (RCTs) involving animals or human using natural ingredients in the management of gag reflex. The exclusion criteria were participants with central or peripheral nervous system disorders; oral lesions or any other systemic medications that might affect the gag sensation; or altered anatomy due to surgery

3. Results and discussion

This review article aims to expose the available natural remedies for the intervention of gag reflex in the patients. This shows that the majority of the techniques for the effective treatment of gag reflex turned out to be ineffective and time-consuming in one or the other way. Usage of herbal extracts for the treatment of gag reflex has temporary and faster effects when compared to the above said conventionally available treatment modalities, besides this the herbal drugs that is used for the treatment of gag reflex have less or no side effects. These herbal drugs have local anaesthetic actions that is caused by the presence of tannins in it. Literature quotes that tannic acid is been widely used in dentistry for the treatment of gagging which is present in herbal drugs has significant anaesthetic effect on the oral cavity mucosa.(14)

3.1. Natural ingredients used in the management of gag reflex

3.1.1. Effect of *Elaeagnus Angustifolia* (Russian olive) in gag reflex

Elaeagnus Angustifolia is a tree with a spiky leaves tree which is of 5-6 cm. The fruits of *Elaeagnus Angustifolia* contains acid maleic, calcium malate, ascorbic acid and butyric acid which is used to treat scurvy. The muscle-relaxant effect of this substance is similar to 1 mg/kg diazepam which has been proved in mice. *Elaeagnus Angustifolia* contains tannins which can be used as a local anaesthetic for the treatment of pemphigus ulcers and oral aphthous. One such study was done to estimate the effects of *Elaeagnus Angustifolia* (tannin) in the treatment gag reflex in patients. The study shows that *Elaeagnus Angustifolia* extracts gradually reduces the gag reflex in both soft palate and pharyngeal tonsils. The McNamar test conducted at the time of study shows that there is a significant difference of gag reflex in soft palate and pharyngeal tonsil unlike placebo group that showed no difference among the case group Therefore, this can be used as a treatment for management of patients who report with gag reflex which is found to be an effective method in this study. (15)

3.1.2. Effect of sesame peel extract in gag reflex

Studies done by Fariba Baluch et.al, shows that sesame peel extract is found to be an effective medicine for the control of gagging in patients. A tablet was made from the sesame peel extract in ex vivo and were examined for gagging in random sample patients by inducing mild stimulation in the palate and were measured in Glasgow scale ruler. The patients were recorded with level 10 of nausea were made to have this pill in mouth for maximum 4 minutes. The soft palate was stimulated followed by the pill placement and nausea sensation was measured by patient's ruler (16). However, the study suggest that additional extensive studies should be carried out in the field of herbal medicine.

3.1.3. Effect of Pomegranate Peel Extract in gag reflex

The *Punica granatum* (pomegranate) is the large shrub of 12-16 feet which has spiny branches and lance shaped leaves. Pomegranate peel contains hydrolysable tannic acid that has local anaesthetic properties. Apart from the local anaesthetic effects of pomegranate, the Peels of pomegranate contains astringent that can be used for treating swellings, diarrhoea, bleeding. It also contains phytochemical like polyphenolics, flavonoids, anthocyanosides, alkaloids, lignans, and triterpenes which are found to be useful in the treatment.

The study done by Hekmati an Ehsan et.al, was evaluating the use of pomegranate peel extract lozenges for controlling gag reflex in dental patients. This study shows that pomegranate peel extract is an effective agent that can be used to control gag reflex during dental procedures; however, the study states that more extensive studies are necessary on this above said aspect (17, 18, 19).

3.1.4. Effect of Ginger in gag reflex

Ginger is a ground stem also called as rhizome belonging to *Zingiber officinale* which has been used as a traditional medicine for centuries. Ginger is a medicine which is more commonly used for the treatment of nausea and vomiting.

Few pharmacological studies proved that the antiemetic property of ginger is related to the direct action on the gastric system, that are the volatile oils and pungent phenols (gingerols).

The study “The Effects of Ginger, Diazepam and Metoclopramide in Patients Receiving Dental Treatment” proves that ginger is an effective medicine to treat gag reflex in medical and dental setup. In this study ginger capsules were prepared where each capsule contains 1 gm of ginger extract and were instructed to take orally for 5 days. Though the exact mechanism of action of ginger is not clearly defined by most of the studies for controlling gag reflex, ginger extract controls serotonin (5-HT₃) receptors and produces antiemetic effects in the GIT and CNS. Study shows that the clinical trials done to compare effects of ginger, diazepam and metoclopramide for controlling gag reflex, indifferences were seen among the effects of ginger and diazepam. Hence ginger can be used as a substitute to metoclopramide for management of gag reflex. This can be justified by saying that the mechanism of action of metoclopramide and ginger is found to be similar during the studies. Ginger is found to be a promising antiemetic substitute however it requires much more studies are needed in field of human and clinical trials to assess the effects of their consumption for a prolonged period of time (2)

4. Conclusion

Nausea and vomiting are the most unpleasant situation faced by both doctors and patients at the time of treatment. It affects the attitude of the patients towards the treatment. To avoid such situations the patients can be priorly informed about the treatment methods and consent should be obtained which prevents psychogenic gagging. It is important to understand that the cure for gag reflex is based on treatment of the cause and not merely about symptomatic treatment of the patients. Proper conversation with the patients and complete history taking could give answer for the causes for the gagging. For centuries gagging is treated by conventional medicines it is important to recognize the immense values of herbal medicines that works as effective as conventional medicine. This review article signifies the importance of natural remedies which has less or no side effects that turns out to be an additional benefit for the patients. Through this review article we can learn that there are only few literatures available when natural remedies are been concerned. This review article emphasises the importance of need of research and initiative for medical practice among medical and dental field will bring revolution for the next generation as these conditions are carried from generations to generations unlike conventional methods herbal treatment bring changes at cellular level which has long lasting power. As a doctor it is always best to give best treatment for the patients which can be fulfilled by adding the usage of natural remedies to the conventional methods of treatment of gag reflex.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest.

Author Contribution

Bhavani balakrishnan: Concept/Design, Data analysis/interpretation, Drafting article, Critical revision of article, Statistics, Funding, Data collection.

Sunantha selvaraj: Concept/Design, Data analysis/interpretation, Drafting article, Critical revision of article, Statistics, Funding, Data collection.

Dorairaj jayachandran: Drafting article, Critical revision of article, Statistics, Funding, Data collection.

Subash lenin: Concept / Design, Critical revision of article.

References

- [1] Ali S, George B, Kirmani U, Al-Saiari AK, Almasabi FR, Iqbal Z. Gagging and its management in prosthodontic patients—a review of literature. *Biomedica*. 2018 Jul; 34(3):179.
- [2] The Effects of Ginger, Diazepam and Metoclopramide in Patients Receiving Dental Treatment. *Al-Rafidain Dental Journal*, 2010; 10(2): 358-365. doi: 10.33899/rden.2010.9025

- [3] Prashanti.E, Sumanth.KN, Renjith George.P, Karanth.L, Soe.HH.Management of gag reflex for patients undergoing dental treatment. Cochrane Database of Systematic Reviews 2015, Issue 10
- [4] Kumar S, Satheesh P, Savadi RC. Gagging. New York State Dental Journal 2011; 77(4):22-7. [PMID: 21894827]
- [5] Murthy V, Yuvraj V, Nair PP, Thomas S, Krishna A, Cyriac S. Management of exaggerated gagging in prosthodontic patients using glossopharyngeal nerve block. BMJ Case Reports 2011;pii:bcr0720114493
- [6] Van Houtem CM, Van Wijk AJ, Boomsma DI, Ligthart L, Visscher CM, De Jongh A. Self-reported gagging in dentistry: prevalence, psycho-social correlates and oral health. Journal of Oral Rehabilitation 2015;42(7):487-94. [PMID: 25784089]
- [7] Bassi GS, Humphris GM, Longman P. The etiology and management of gagging: a review of the literature. Journal of Prosthetic Dentistry 2004;91(5):459-67
- [8] Conny DJ, Tedesco LA. The gagging problem in prosthodontic treatment. Part II: Patient management. Journal of Prosthetic Dentistry 1983;49(6):757-61
- [9] Saita N, Fukuda K, Koukita Y, Ichinohe T, Yamashita S. Relationship between gagging severity and its management in dentistry. Journal of Oral Rehabilitation 2013;40(2):106-11
- [10] Lu DP, Lu GP, Reed JF 3rd. Acupuncture/acupressure to treat gagging dental patients: a clinical study of anti-gagging eCects. General Dentistry 2000;48(4):446-52
- [11] Ramsay DS, Weinstein P, Milgrom P, Getz T. Problematic gagging: principles of treatment. Journal of the American Dental Association 1987;114(2):178-83
- [12] Eitner S, Wichmann M, Holst S. "Hypnopuncture"--a dentalemergency treatment concept for patients with a distinctivegag reflex. International Journal of Clinical and Experimental Hypnosis 2005;53(1):60-73. [PMID: 15788244]
- [13] Sari E, Sari T. The role of acupuncture in the treatment of orthodontic patients with a gagging reflex: a pilot study. British Dental Journal 2010;208(10):E19
- [14] Bhat MK. Fruit for ulcers. British Dental Journal 2006;201(6):323.[PMID: 16990864]
- [15] Hekmatian E, Asghari G, Najafi RB, Moosavi SH. Evaluation of the effect of *Elaeagnus Angustifolia* drug film on gag reflex. اصفهان دندانپزشکی دانشکده مجله. 2011 Dec 15:395-401.5.
- [16] Balouch F, Mohammadi M, Asad Afrooz G. Effect of sesame peel extract lozenge on gag reflex. Research in Medicine. 2021 Sep 10;45(3):1-5.
- [17] Eghbali, S., Askari, S. F., Avan, R., & Sahebkar, A. (2021). Therapeutic Effects of Punica granatum (Pomegranate): An Updated Review of Clinical Trials. Journal of nutrition and metabolism, 2021, 5297162. <https://doi.org/10.1155/2021/5297162>.
- [18] Prasad, D., & Kunnaiah, R. (2014). Punica granatum: A review on its potential role in treating periodontal disease. Journal of Indian Society of Periodontology, 18(4), 428–432.
- [19] Hekmatian Ehsan, Shadmehr Elham, Asghari Gholamreza. Effect of pomegranate peel extract lozenge on gag reflex in dental patients. Journal of Isfahan Dental School. 2011 [cited 2022]June14];7(3):229-235.