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The Effects of Ginger, Diazepam and Metoclopramide in Patients Receiving Dental Treatment

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الخلاصة

الهدف من الدراسةتهدف الدراسة الى تشخيص وعلاج المرضى المصابون برد الفعل البلعومي والغثيان إثناء المعالجة السنية ومقارنة تأثيرات الزنجبيل ، عقار الدايازيبام وعقار الميتوكلوبرامايد كمواد علاجية مختلفة لهذه الحالة . **المواد والطرق**:أجريت هذه الدراسة على (120)مريضا ،(37) ذكور و(83) إناث والذين يعانون من حالات رد الفعل البلعومي والغثيان بدرجات متوسطة وشديدة ، وكانت أعمارهم تتراوح بين (31- 68) سنة . وقد تم تقسيم عينات المرضى عشوائيا إلى(4)مجاميع ، كل مجموعة تتألف من (30) مريضا والذين تمت معالجتهم بمواد علاجية مختلفة هي { الزنجبيل ، عقار الدايازيبام ،عقار الميتوكلوبرامايد و سكر الكلوكوز(العلاج المموه)}.تم تسجيل شدة رد الفعل البلعومي قبل وبعد العلاج بالاعتماد على ملاحظات المريض وردة فعله المباشرة.استعمل اختبار (كروسكال- والس) لمقارنة الاستجابة للعلاج لدى مجاميع المرضى كافة. **النتائج**:أظهرت الاستجابة للعلاج بالمواد المختلفة أن هناك فروقات معنوية لدى مجاميع المرضى كافة. **الاستنتاج**:ان مادة الزنجبيل هي مادة ذات فعالية مضادة لرد الفعل البلعومي والغثيان وانها يمكن أن تكون مفيدة في تقليل الشعور بالغثيان والقئ عند المرضى

ABSTRACT

Aims: To diagnose and treat patients with gagging reflex during dental treatment and to compare effects of ginger, diazepam and metoclopramide as different treatment modalities. **Materials and Methods:** This study was carried out on 120 dental patients, 37 males and 83 females who they are suffering from moderate to severe gag reflex, their ages was ranged between 31 – 68 years old. The sample is randomly subdivided into 4 groups, each group consist of 30 patients, they was received different treatments (ginger, diazepam, metoclopramide and glucose (placebo)). Severity of gag reflex before and after treatments is reported depending on patient's words and direct reaction. **Results:** Kruskal – Wallis test was used to compare the response to treatment in 4 groups and there was significant differences between them ($p \leq 0.00$). **Conclusion:** Ginger is effective antiemetic agent and can be useful for reducing nausea and vomiting (gag reflex) during and after dental treatment.

Key words: Nausea, vomiting, gag reflex, ginger.

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INTRODUCTION

The dental patients who develop gagging problem are frequently difficult to be treated.[1] In humans, the motor – reflex response of vomiting is often but not always preceded by an unpleasant sensation termed nausea, the CNS play a critical role in the physiology of nausea and vomiting, serving as the primary site that receives and processes a variety of emetic stimuli also it play a primary role in generating efferent signals which are sent to a number of organs and tissues in a process that results in vomiting.[2]Gagging is an involuntary contraction of the muscles of the soft palate or pharynx which results in retching [3], and it is mediated by mechanoreceptors in superior laryngeal nerve which project to nucleus tracus solitarius.[4,5] It is an adaptive vital mechanism controlled primarily by the parasympathetic division of autonomic nervous system, although the tactile stimulation of the sensory receptors of the soft palate is the most obvious mean by which the reflex can be elicited. Gustatory, olfactory, visual cognitive stimuli may also elicit the reflex either as unconditioned or conditioned stimuli.[1,6]Nausea (the perception that emesis may occur) can be judged only by the patient, although the incidence of nausea correlates with the incidence of vomiting, nausea generally

occurs more frequently than vomiting.[7] Some patients have a hypertensive gagging reflex evident prior to and during dental treatment, and it is not uncommon to see such patient which present a problem for dentists [8,9], because failure to overcome the hyperactive reflex may leave the patient without dental treatment.[10] Gagging can result from chemical irritants, toxic materials ingested with food, specific drugs such as chemotherapy, severe pain, strong emotional situations or mild stimulation of the pharynx or fauces.[11]

Several treatment approaches beyond the complementary modalities alone or in combination with pharmacotherapy play an important role in prevention and management of nausea and vomiting.[12] Authors had advocated hypnosis or various medications such as metoclopramide, sedatives, antihistamine, parasympatholytics and topical anesthesia with lidocaine spray, relaxation plus controlled breathing, positive self statement and performance of incompatible responses such as reading a load have been used in some success.[13,14] Some dentists making impression of a maxillary edentulous patient with gag reflex by pressing caves[15] and other utilize a non – invasive nerve stimulation device applied to the wrist during dental procedures.[5] Herbal treatment of gag reflex also have been used, ginger which is one of the more commonly used herbal supplements has been shown to be effective in management of nausea and vomiting.[16-18]

Ginger is under ground stem or rhizome of the plant Zingiber officinale which has been used as a medicine in Arabic herbal traditions since ancient times.[19] The aim of this study was to diagnose and treat patients with gagging reflex problem whom need dental treatment and to study the effect of ginger in reducing gag reflex compared to metoclopramide and diazepam.

MATERIALS AND METHODS

In this clinical study, the sample consisted of 120 dental patients, 37 males and 83 females who they had receiving dental treatment, and suffering from moderate to severe gag reflex. Other causes of nausea and vomiting such as pregnancy, urinary tract infections, thyrotoxicosis and drugs like chemotherapy has been excluded. Patient ages ranging between 31 – 68 years old, they attending College of Dentistry / University of Mosul and the Nineveh Health Directorate / Ministry of Health. The collection and selection of patients was depend on certain information obtained directly from each subject using special case sheet as shown in Figure (1), so 120 case sheets were prepared especially for this study. The sample is randomly subdivided into 4 groups, each group consists of 30 patients, and they were received different types of dental treatment. All agents that are used for treatment were enclosed into empty hard gelatin capsule in order to have the same form, so that all patients were receive their treatment blindly. First group was treated by ginger capsules orally, each capsule was prepared to contain (1 gm) of fresh ginger and to be taken once daily for 5 days. Second group was treated by metoclopramide (10 mg) capsules (SDI/Iraq) / 3 times daily for 3 days while third group receive diazepam (2 mg) capsules (SDI/Iraq) one hour before dental procedure. Last group was taken glucose powder capsules once daily for 3 days. Each patient was placed on dental chair and checked for gag reflex by inserting a cotton roll of (4 cm) length in the lingual vestibule opposite to lower first and second molars, severity of gag reflex is reported depending on patient's words and direct reaction, after that treatment was given for each patient and he/she was instructed to come back in order to check and evaluate their gag reflex using the same method mentioned above, improvement was signed by (yes) and no improvement was signed by (no). Statistical analysis of data was used to compare effects of these treatment modalities.

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etaD:

1. Patient's name:
2. Age
3. Sex
4. Medical history
5. History of gag reflex problem during dental treatments(Yes , No)

   If the answer is "Yes":

   Which type of gag reflex does he/she have?

   A. Mild: rarely occur.

   B. Moderate: occasionally occur.

   C. Severe; immediate (direct) reaction during and after dental treatment

Figure (1): Special Case sheet used in this study

RESULTS

120 patients had gag reflex problem during dental treatment were participated in this study, their mean of age was 44.98 (Table 1).

Table (1): Age distribution of dental patients according to response to treatment of all study groups.

Response	No. of subjects	Range of age	Mean of age (Years)
No	66	38	45.53
Yes	54	29	44.30
Total	120	38	44.98

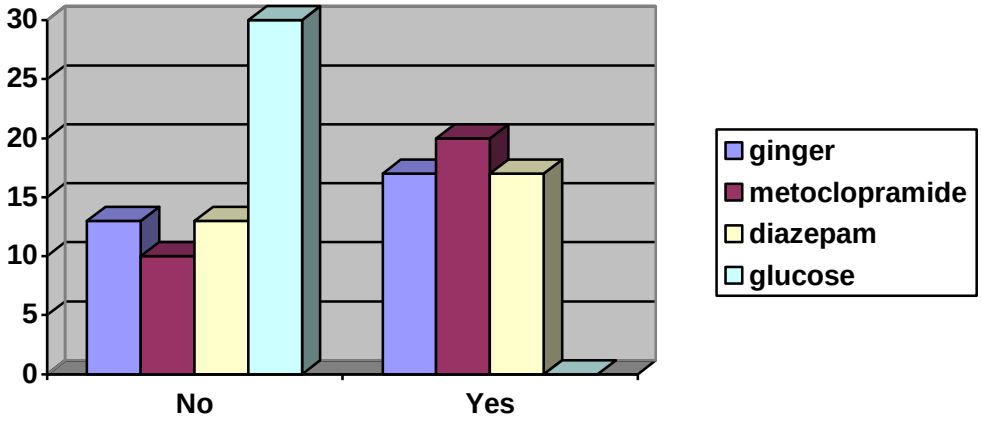
No: no response to treatment.; Yes: good response to treatment.

The percentage distribution according to response for treatment modalities and their sex was shown in (Table 2) and (Figure 2).

Table (2): The distribution of dental patients according to their response to treatment and sex in all study groups.

Drug	Response	Sex		Total
		M	F	
Ginger	No	6	7	13
	Yes	5	12	17
Metoclopramide	No	3	7	10
	Yes	7	12	20
Diazepam	No	3	10	13
	Yes	6	11	17
Glucose	No	7	23	30

M: male; F: female; No: no response to treatment; Yes: good response to treatment.



Figure(2): The distribution of dental patients according to their response to treatments in all study groups

No : no response to treatment; Yes: good response to treatment

The percentage distribution of them according to severity of gag reflex and their sex was shown in (Table 3) and (Figure 3), and it is clear that higher percentage was obtained with female than male.

Table (3): The percentage distribution of dental patients according to severity of gag reflex and sex in all study groups.

Drug	Sex	Severity		Total
		Moderate	Severe	
Ginger	M	5 (16.7%)	6 (20.0%)	11 (36.7%)
	F	5 (16.7%)	14 (46.7%)	19 (63.3%)
	Total	10 (33.3%)	20 (66.7%)	30 (100.0%)
Metoclopramide	M	5 (16.7%)	6 (20.0%)	11 (36.7%)
	F	7 (23.3%)	12 (40.0%)	19 (63.3%)
	Total	12 (40.0%)	18 (60.0%)	30 (100.0%)
Diazepam	M	4 (13.3%)	5 (16.7%)	9 (30.0%)
	F	11 (36.7%)	10 (33.3%)	21 (70.0%)
	Total	15 (50.0%)	15 (50.0%)	30 (100.0%)
Glucose	M	1 (3.3%)	6 (20.0%)	7 (23.3%)
	F	9 (30.0%)	141 (46.7%)	23 (76.7%)
	Total	10 (33.3%)	20 (66.7%)	(100.0%)

M: male; F: female

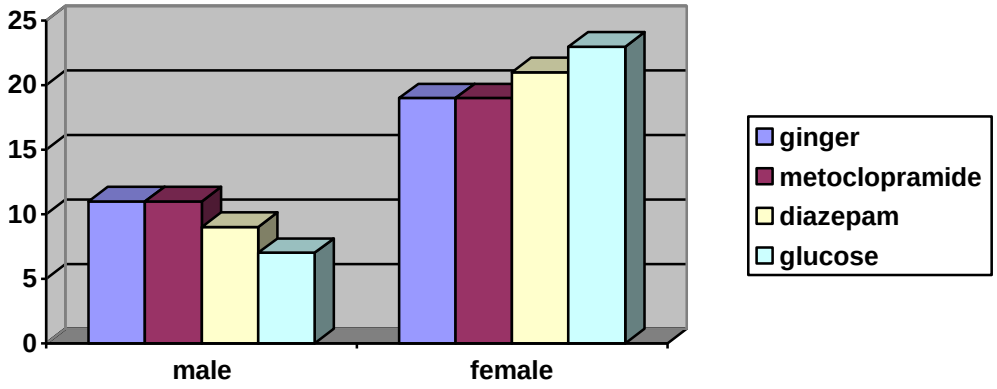


Figure (3): The distribution of gag reflex in dental patients according to sex in all study groups.

Kruskal – Wallis test was used to compare the response to treatment in 4 groups and there was significant differences between them ($p \leq 0.00$).

Z – Proportion test was used to compare the response to treatment in first group (ginger) and second group (metoclopramide), there was no significant differences between them ($p \leq 0.597$), and no significant differences was found between first (ginger) and third (diazepam) groups ($p \leq 1.000$), also between second group (metoclopramide) and third group (diazepam); ($p \leq 0.597$). Significant differences were noted between first (ginger), second (metoclopramide) and third (diazepam) groups compared to forth group (glucose); ($p \leq 0.00$) (Table 4).

Table (4): The response to treatment in all study groups.

Drug (1)	Drug (2)	*P* - value
Ginger	Metoclopramide	*P ≤ 0.597*
Ginger	Diazepam	*P ≤ 1.000*
Metoclopramide	Diazepam	*P ≤ 0.597*
Ginger	Glucose	*P ≤ 0.000*
Metoclopramide	Glucose	*P ≤ 0.000*
Diazepam	Glucose	*P ≤ 0.000*

Significant difference at *P ≤ 0.05*

DISSCUSION

The gag reflex is a somatic natural response in which the body attempts to eliminate instruments or agents from the oral cavity by muscle contraction.[20,21] A pronounced gag reflex can be a severe limitation to a patient's ability to accept dental care and for a clinician's ability to provide it. It can compromise all aspects of dentistry from diagnostic procedures to active treatment and can be distressing for all concerned.[22]Many management techniques have been described, some of them was used in this study to manage people with pronounced gag reflexes.

One of these treatment categories was metoclopramide which is valuable drug useful for treatment of nausea and vomiting, acting both centrally (block dopamine 2 receptors in the chemoreceptor trigger zone) and peripherally (stimulate release of acetylcholine); in addition to that it can inhibit 5 – HT3 receptors.[23-27]

In regard to benzodiazepines, researches has produced mixed results regarding the efficacy of anxiolytic drugs

like diazepam premedication in preventing nausea and vomiting. Diazepam is the prototype of benzodiazepines which can reduce anticipatory nausea and vomiting[28], it will enhances the affinity of GABA (gamma amino butaric acid) receptors for this neurotransmitter resulting in enhanced hyperpolarization and inhibition of neuronal firing. The antiemetic potency of diazepam may be due to it is sedative, anoxiolytic and amnesic properties.[29-31]Studies has been done to investigate the prophylactic antiemetic effect of sedatives like diazepam, midazolam and lorazepam, concluding that they are effective for reducing nausea and vomiting [32,33] and intravenous sedation have benefit to facilitate prosthodontic treatment for problematic gagging patients intolerable to dental therapy.[34] Others showed that anxiolytics have no benefit as antiemetic.[35] Ginger (zingibar officinales) is one of the more commonly used herbal supplements, it is a member of family of plants that includes cardamom and turmeric,[36] which is used to ameliorate symptoms of nausea and evaluated as treatment of nausea and vomiting associated with pregnancy motion sickness, chemotherapy and post operative nausea and vomiting.[1,2,37]The exact mechanism of action of ginger is unclear, although it appears to inhibit serotonin (5 – HT3) receptors and to exert antiemetic effects at the level of central nervous system and gastrointestinal tract.[36] Pharmacological studies indicate that antiemetic effect of ginger in related to the direct action of ginger's active components on the gastric system,[35] which are the volatile oils and pungent phenol compounds (such as gingerols and shogaols) [38]. About dosing of ginger, no specific dosing studies have been performed, however, most clinical researches use between 250 mg and 1 gm of the powdered root of ginger in capsular form, to be taken one to four times daily.[39-43] This clinical trail compare ability of ginger, metoclopramide and diazepam in reducing gag reflex during dental treatment. There was no significant differences between them , which means that ginger and diazepam can be used as alternative to metoclopramide in controlling gag reflex and this could be related to similarity in the mechanism of action between metoclopramide and ginger , this was in agreement with results of many studies [44-50] and in disagreement with others[51,52]In the results of this study we can also notice the higher incidence of nausea and vomiting with less response to treatment among females compared to males in all study groups and this is related to high incidence of nausea and vomiting during dental appointment in female gender.[53-55] Addition of ginger to standard antiemetic regimen has advantage in reducing gag reflex during dental treatment.

CONCLUSIONS

Chronic and unexplained nausea and vomiting can be a challenge for dentist. Ginger is effective and promising prophylactic antiemetic which may be especially useful for dental patients, but more studies are required in animals and human on the kinetics of ginger and its constitutes and on the effects of their consumption over along period of time.

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