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Taking dental impressions of dental medicine students: with and without vomiting reflex.

Molnar-Varlam Cristina[1], Szekely Melinda[1], Tudor Sîrbu[1], Moldovan Iunia-Beatrice[1]

[1]George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Targu Mures, Romania

Abstract

Introduction: It is a well-known fact that during a dental impression, some patients suffer from the gag reflexes.

Aim of the study: Even if the main tendency is to use medication, our goal is to find a way to combat it.

Material and methods: With the help of our 155 volunteering students, from UMFST Târgu Mureș, who agreed on having their dental impression taken, using alginate material, we tried to combat the gag reflex, using the following techniques: the high-leg method, salt crystals, as well as using a special impression tray.

Results: When we applied all of these methods, great attention was payed, as we diligently wrote everything down. After all the work was done, we obtained the following results: 130 did not show any vomiting signs, 17 of them presented moderate vomiting reflex and only 8 of them have shown extreme vomiting reflex, leading to the point where the impression could not be performed.

Conclusions: On the one hand, for the less informed people, these techniques present a better outcome; on the other hand, however, we wish to highlight one thing: the skills of the doctor are of utmost importance.

Keywords: gag-reflex, students, dental-impression, non-medical method

Introduction

The vomiting reflex is a reflex act, which consists in the sudden evacuation of the gastric content through the oral cavity, outwards. As a dentist, you may find yourself in this situation often and confront this recurring problem.

This makes it very difficult to perform some therapeutic acts or maneuvers or may even make the treatment impossible, although nowadays various methods by which the vomiting reflex can be controlled exist, especially the administration of an anti-emetic medication. There are also non-drug methods that can be effective to patients with vomiting reflex. Our goal was to demonstrate the effectiveness of these non-drug methods by which we could combat the vomiting reflex that occurs during dental impression [1].

Material and methods

On a group of 155 volunteer students from the Faculty of Dental Medicine of University of Medicine and Pharmacy, Science and Technology, UMFST from Tg-Mureş, we performed a study to highlight the frequency of gag reflex that appears during dental impression of the dental arches and the efficiency of the non-medicinal methods used to combat the vomiting reflex.

The study group included 155 students from Faculty of Dental Medicine, University of Medicine and Pharmacy, Science and Technology, UMFST from Tg-Mureş (n = 155) of which 90 were female subjects and 65 male subjects with the age between 19 and 25 years. All the participants agreed to be part of this study, without remuneration or any other reward that may influence their decision [2].

Inclusion criteria: students from Dental Medicine, clinically healthy, without diseases in the oral-maxillofacial area.

Exclusion criteria: students who had general or local clinical conditions, students who had orthodontic devices [3], students undergoing drug treatment, students who had recently dental bleaching or student who had nausea due to other causes.

This study was unfolded over four weeks, each student being subjected to the same conditions when their impression was taken: the same material was used and the same impression method. Also, all the dental impressions were taken by the same doctor.

The material used for the impressions was an elastic material based on irreversible hydrocolloids, respectively an alginate (Tropicalgin from Zhermack, Italy) with a fast setting time. We chose to take this dental impression with an alginate for the following reasons: alginate is most commonly used for dental impressions in the making of documentation models, dental impression with alginate runs really fast, due to its viscosity and the thicker layer of material, compared with other elastic materials the alginate can cause more nausea so the gag reflex [4] appears more often. The impression trays used were the basic ones with holes and spaces, as retentions and ergonomic handle. The size of the impression tray was carefully and specifically chosen for each student in the study. The impression trays made of plastic material have as a means of retention 2 mm diameter holes, spaces and positive retention forms, as well as side fins/wings for easier removal.

The same protocol was followed during all of the dental impressions. The volunteers were not informed about the subject of this study precisely because we did not want to induce them on a subconscious level that fact and idea that they might throw up; also, any discussions related to the possibility of the gag reflex and vomiting was avoided. All the maneuvers were done calmly, safely, with safe and firm movements, inducing a feeling of confidence and control, trying to produce less discomfort as possible to the patients. Given that the entire lot of volunteers was represented by students in Dental Medicine, this means all of them knew about dental impression with alginate and how a dental impression is taken.

The dental impression itself: after informing the participants about the process we were about to perform as well as their position, we invited them to take a sit in the dental chair, with the headrest in the right place [5]. The right size of the impression tray was chosen and the impression process started. Each patient rinsed their mouth before each dental impression.

First, we took the impression of the mandible after that, the impression of the maxilla.

For the preparation of alginate, we used water and powder dispensers, we used distilled water at room temperature, the alginate package being agitated before preparation. We used the special rubber bowl for alginates and a wide spatula.

For the upper arch, we used 2 measures (doses) of alginate and the volume of distilled water correspondingly measured with the cylinder in the kit; for the lower arch we used a measure and a half of alginate.

The alginate has been manually prepared in a rubber bowl. First of all, the alginate dust was added, which was previously shaken, over which we poured the distilled water, at room temperature. Using a wide plastic spatula, the alginate dust was first mixed with the water until a homogenous and smooth texture was obtained. After that, we started the mixing process itself, with circular moves, holding the spatula as parallel as possible to the walls of the bowl. The moves were energetic and quick. The mixing process continued until the desired consistency of our alginate paste has been reached.

This group of moves needs to be performed quickly, in order to avoid the premature hardening of the material. With one single move, the impression material was gathered on the spatula, followed by the immediate loading, from the posterior area to the front of the impression tray. The correct way of loading the impression tray is with a scraping move on the side of it, instead of simply adding it.

One key aspect of a correct impression is the way the tray is inserted in the oral cavity, and applied on the prosthodontic field: it needs to be introduced distally, with gentle force to move it anteriorly, in order to reduce the chances of the material flowing posteriorly, towards the soft palatal tissue and the pharynx.

As far as lower maxilla is concerned, we followed the same rules as for the upper maxilla, with less material.

We need to let the patient know about the correct way of holding his tongue. This is important, because the tongue's position needs to facilitate the dental impression, to make the lower frenulum visible.

After all the impression maneuvers have been completed, the trays have been maintained on the prosthodontic field, without applying pressure, until the surface of the

alginate tends to lose its initial shine and it does not stick anymore.

Because of the fact that the patient has rinsed his mouth with room temperature water and because the doctor allowed air to get in between the impression and the gingiva, the detachment happens really quick and easy, without any distortions or traction marks.

If the volunteers had an obvious vomiting reflex, the following drug-free methods have been applied in order to combat this reflex [6],[7].

The first applied method was: "The high leg method".

We asked the patient to raise his leg, mentioning that it should be the left leg, describing how it should be done, at which height and which angulation the knee should be. We also asked the patient to mention through a hand sign, the moment when he feels muscular fatigue at a leg level. The patient continues to keep his leg up and we ask him to concentrate towards the leg and keeping the right leg position.

This method works because the patient is busy holding his leg in the air and he is not paying attention to what the doctor does, that is why this is an efficient method to distract the patient [8].

If this technique doesn't work, we could also try the "Salt Crystal" technique. This technique, tends to reduce the vomiting sensation due to the salt crystals applied on the tip of the patient tongue [9].

To help dentists, custom made impression trays have been invented, with perforations and wide palatal spaces, created to reduce the vomiting sensation by guiding the excess material to overflow through those special spaces [10].

Another relatively easy technique, is positioning the patient as vertical as possible in the chair, so that the occlusion plane of the superior molars are parallel to the ground.

What's more, if the patient shows really severe vomiting reflexes, it is best to position him leaning forward; that way the material can overflow anteriorly more than distally towards the palate. Together with the placement of the patient vertically, we tell the patient to breathe through his nose, rarely and keeping his gazing on a certain point [11].

In the case of really intense and severe vomiting reflexes, it is best to use the saliva vacuum. With the help of it, the assistant can easily control the quantity of saliva in the patient's oral cavity.

As an alternative, we also had one fast setting type of alginate (Orthoprint). What's more, alginate can be prepared using a semiautomatic method, with the Algamix. Therefore, the material is smoother, and sets faster, compared to the usual alginate [12].

Patients with vomiting reflex (n=25 of the volunteers) have received a questionnaire (figure 1) which addressed the vomiting reflex during the dental impression. It consists in 5 questions, each one with 5 different answers.

The questions and answers of the questionnaire, were realized, in a manner to offer a general image, more detailed, exact and focused on the intensity of the vomiting reflex, it's characteristics and particularities [13].

We have carefully analyzed the behavior of each volunteer during the impression taking process, at the moment the impression tray was inserted in the oral cavity, especially during the setting reaction as well as at disinsertion.

Results and discussion

From the initial lot of 155 volunteer students, from the Dentistry Faculty of Târgu Mureș, 25 of them manifested vomiting sensations. The answers from the questionnaire were conclusive for finding out details regarding the intensity and the way this reflex manifested (figure 2).

The questionnaire gives to the students with vomiting reflex

1. **How do you feel when you brush your back teeth?**
   a. I experience no nausea whatsoever
   b. I feel slightly nauseated
   c. I am afraid I will vomit
   d. I can't do it because I immediately feel nauseated and fell like vomiting
   e. I experience actual spasms in my throat and sometimes actually vomit
2. **How do you feel when you are waiting in the dentist's waiting room and thinking about the anticipated dental treatment?**
   a. I experience no nausea whatsoever
   b. I feel slightly nauseated
   c. I am afraid I will vomit
   d. I can't do it because I immediately feel nauseated and fell like vomiting
   e. I experience actual spasms in my throat and sometimes actually vomit
3. **How do you feel when you are sitting in the dental chair and the dentist is checking your teeth with a mirror and other instruments?**
   a. I experience no nausea whatsoever
   b. I feel slightly nauseated
   c. I am afraid I will vomit
   d. I can't do it because I immediately feel nauseated and fell like vomiting
   e. I experience actual spasms in my throat and sometimes actually vomit
4. **How do you feel when the dentist is working on your back teeth?**
   a. I experience no nausea whatsoever
   b. I feel slightly nauseated
   c. I am afraid I will vomit
   d. I can't do it because I immediately feel nauseated and fell like vomiting
   e. I experience actual spasms in my throat and sometimes actually vomit
5. **The vomiting sensation appeared when taking wich impression?**
   a. Upper maxilla
   b. Lower maxilla
   c. Both maxilla
   d. When checking if the size of impression tray is correct
   e. Even at anterior impression trials, using combat methods

Figure 1. Questionnaire [quoted after 14]

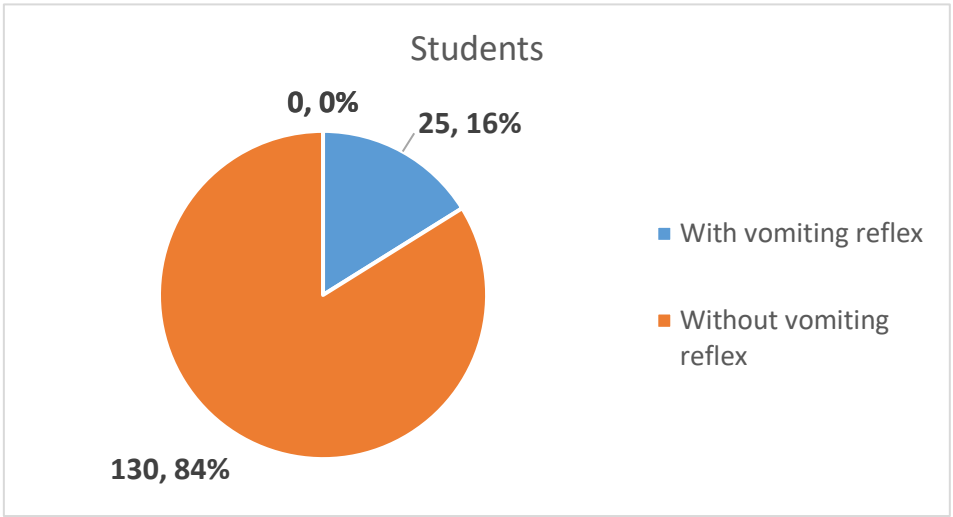


Figure 2. Graphic representation of all the volunteers

At the first question, "How do you feel when you brush your back teeth?" a number of 12 students affirmed that they don't feel anything wrong when they brush their back teeth; 6 of them said they have minimum vomiting sensation and 5 of them are afraid that they might throw up. Only 2 of them stated that in the second they reach the posterior part of the oral cavity, they immediately throw up. Answers: B:24%; C:20% D:8% (figure 3).

At the second question: „How do you feel when you are waiting in the dentist's waiting room and thinking about the anticipated dental treatment?": 17 students (68%) did not manifest any vomiting sensation while seated in the waiting room and 8 students (32%) feel a slight vomiting sensation (figure 4).

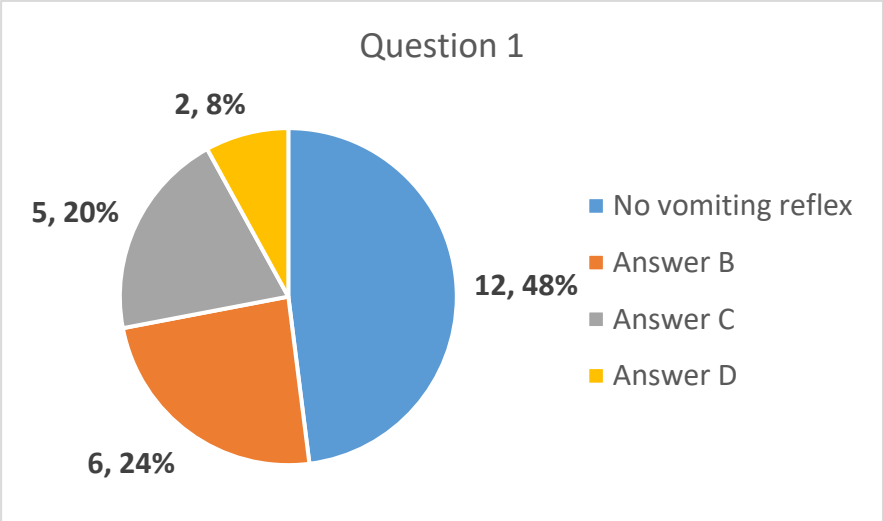


Figure 3. Graphic representation of question 1

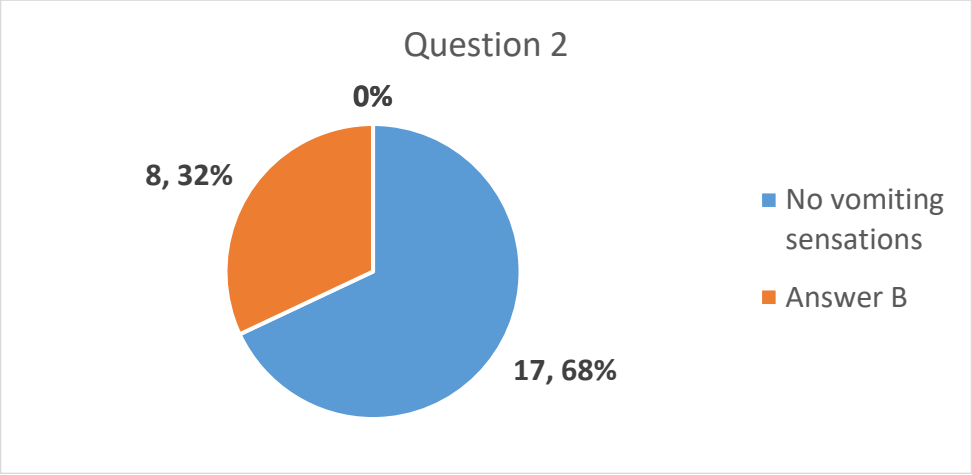


Figure 4. Graphic representation of question 2

Question number three: „How do you feel when you are sitting in the dental chair and the dentist is checking your teeth with a mirror and other instruments?", 10 students (40%) said they do not have any vomiting reflex, 8 students (32%) stated they have minimal vomiting reflex and only 7 of them (28%) said they are afraid they might throw up (figure 5).

Question number 4: „How do you feel when the dentist is working on you back teeth?". A number of 7 students (28%) stated they do not have a problem with the specific dental maneuvers in the posterior part of the oral cavity. 8 students (32%) have minimum vomiting reflex and only 10 of them (40%) feel nauseated (figure 6).

Question number 5: "The vomiting sensation, appeared when taking which impression?" was a really important question, at which the answers were balanced. 13

students out of 25 (52%) do manifest vomiting reflexes especially when taking the impression at the upper maxilla, 4 students (16%) at the lower maxilla, and only 8 (32%) feel this sensation at both maxillae, upper and lower (figure 7).

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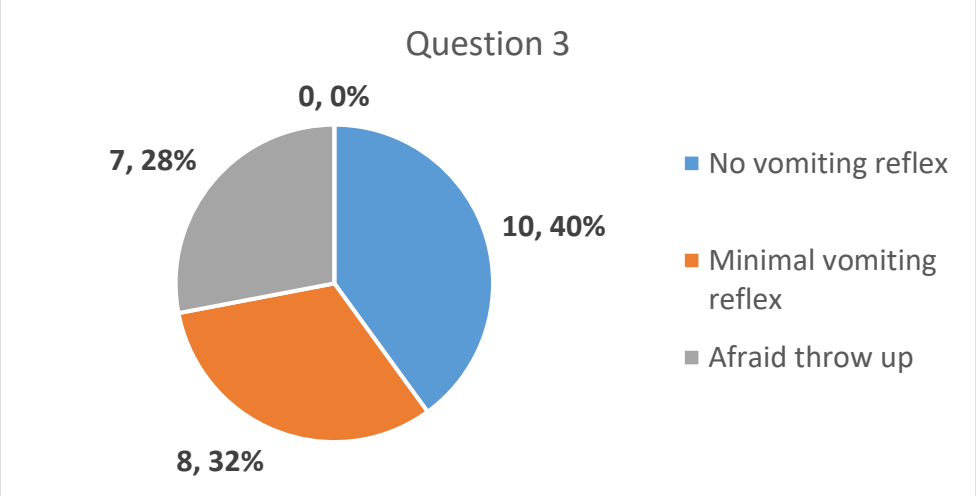


Figure 5. Graphic representation of question 3

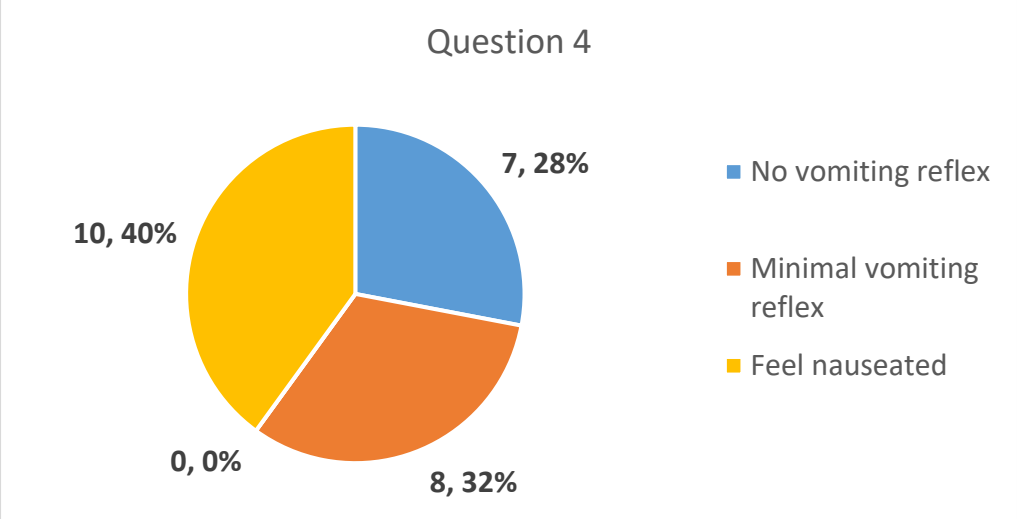


Figure 6. Graphic representation of question 4

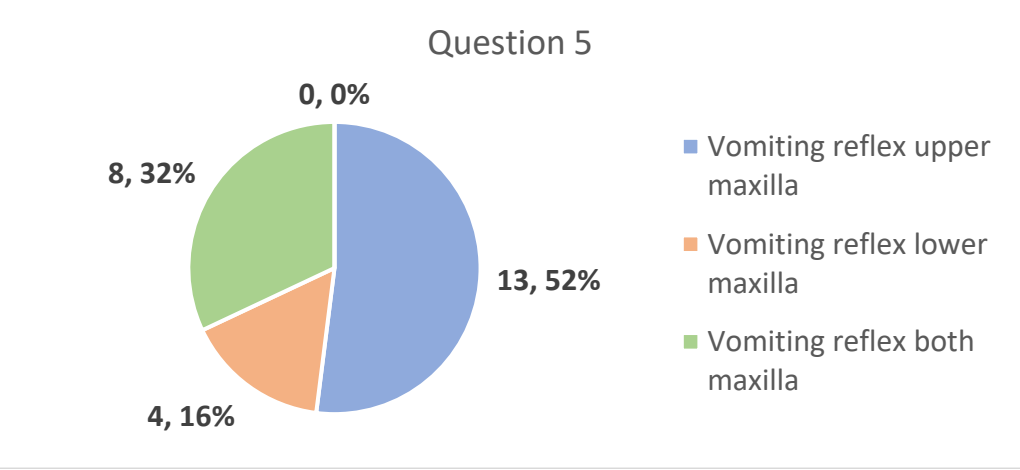


Figure 7. Graphic representation of question 5

Nine students with extreme vomiting reflex at the moment of the impression being taken, we tried to realize the impression with conventional type silicone, with minty flavor and fast setting. From the total of nine students with extreme vomiting sensation, where the alginate impression was almost impossible to take, we have redone the process using conventional type silicone, and succeed in realizing two correct impressions, and in the same time, the patient managed to stay calm until the impression was done.

According to specialty literature, another drug-free method, which has shown positive effects among the patients with vomiting reflex, is acupuncture [15]. „ Exploring alternative methods of gag reflex control Part 2: Acupuncture" states „One of the most commonly investigated points is cheng jiang, also known as CV-24, which is located in the labio-mental fold. A blinded, randomized, controlled study (RCT) on transesophageal echocardiography (TEE) patients has demonstrated the efficacy of this point. TEE reportedly causes nausea or gagging in approximately 60% of people. Participants underwent this procedure with either acupuncture, sham acupuncture or no acupuncture. Statistical analysis demonstrated significant differences, with the acupuncture group experiencing considerably less gagging than the sham group ($p = 0.037$), and even less so than the non-acupuncture group ($p = 0.013$)". It has been proven that next to acupuncture, another really effective drug-free method, with a great success rate, is Pressopuncture. [2] "The results showed a significant ($p<0.05$) reduction in the gag reflex scores after acupuncture. For upper impressions, they fell from 6.8 (1.1) to 1.1 (1.1); and for lower impressions, from 5.45 (1.0) to 0.4 (0.7) (mean (SD)". [16],[17],[18],[19]

Conclusions

The vomiting reflex is a reflex act which represents one of the most common problems in the dental practice, being considered by some of the clinicians a caprice of the patient. However, along the years, different combat methods have been tested, to ease the impression taking process as well as other dental procedures.

Out of all volunteers we have taken impressions of, in this project on behalf of the Faculty of Dentistry from Targu Mures, the ones with moderate vomiting reflex, could not be helped by the different drug-free combat methods.

The volunteers who manifested medium vomiting sensation while taking the impression, were able to be impressed with the help of the same method, without the need of any medicine, in order to ease the process.

Patients with high vomiting sensation, were not eligible of an impression being taken of them, only using these drug-free methods.

Counting on the fact that all the volunteers are students at the Faculty of Dentistry, which means that they have knowledge in the field of the vomiting reflex as well as different combat methods, we consider that in this category, the combat method of the vomit reflex, will not work by distracting them, exactly because of this.

Conflict of interest: None to declare

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Corresponding author:
Iunia-Beatrice Moldovan
George Emil Palade University of Medicine, Pharmacy, Science and Technology of Tirgu Mures, 38 Gheorghe Marinescu street, Tirgu Mures, 540139, Romania
Email: moldovan.iunia@yahoo.com

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