



**ORIGINAL RESEARCH PAPER**

**Dental Science**

**COMPARATIVE STUDY OF FIVE IRREVERSIBLE HYDROCOLLOIDS TO OPTIMIZE THE UPPER IMPRESSION TECHNIQUE**

**KEY WORDS:** Alginates, Dosages, Impression Trays.

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**ABSTRACT**

In the discipline of dentistry, the irreversible hydrocolloid called Alginate is used on a daily basis for taking impressions of the upper and lower jaws in the different specialties of this discipline, However, the incorrect dosage in the alginate-water ratio, which is called powder / liquid, due to the viscosity and fluidity that characterizes this biomaterial when used in a larger quantity, leads to a surplus that causes the patient to gag reflex, vomiting and unexpectedly choking. This study is the continuation of studies already carried out in some alginates, so that is intended to perform the test at all alginates sold. The methodology of this study was the different tests with different five Alginates in combination with impressions porta type Rim-Lock in small, medium and large sizes only in the upper jaw, being where it is most at risk for the relationship with the oropharynx, until obtaining the most precise dosages that allow a better impression taking. The results obtained showed that the dosage reported by the manufacturers of these biomaterials is not precise and does not have a proportional relationship with the different sizes of the impression trays, they only indicate a standard dosage, which is inconvenient to use in all sizes, Therefore, it is proposed to publish the results obtained in the present research in the dental community to improve the quality of care during the dental consultation and thus avoid possible risks with the dental patient.

**INTRODUCTION**

In today's dentistry, various materials are used for taking impressions, both anatomical or static and physiological or dynamic. For anatomical impressions also called preliminary, the irreversible hydrocolloid is still the most used due to the favorable characteristics and a good price for this procedure, that is, obtaining a study model as part of the diagnostic means to develop a treatment plan, in the treatments for orthodontics, pediatric dentistry, etc. Alginate is a biomaterial widely used in daily practice, which has required manufacturers to modify it each time to improve its properties that allow it to satisfactorily meet dental needs.

The consistency of the irreversible hydrocolloid is viscous that allows to reproduce in detail the structures of the hard and soft tissues of the oral cavity,<sup>(1)</sup> but due to the same viscosity and when a greater quantity is used than necessary for each maxillary size, the excess tends to go towards the oropharynx due to gravity, which produces different consequences such as; difficulty swallowing saliva, gag reflex, vomiting, anxiety in the patient, and possible suffocation of the patient.

To obtain all the benefits provided by the reversible hydrocolloid, it is necessary to mix the powder with the exact proportion of water, the mixing time and the material handling time (working time) in accordance with the strict instructions of the manufacturer. of each commercial brand. But they only give the proportions for a standard jaw size, this is what produces that in a medium or small size jaw the powder is mixed with water with the dosages indicated by the manufacturer and that is when the excess of material that favors the possible consequences of the gag reflex.<sup>(2)</sup>

It is important to carry out the present investigation in 5 different commercial brands of alginates to prepare them with the powder-water doses as indicated by the manufacturer, and to determine the exact dose for each size of the impression tray that corresponds to the size of the upper jaw of the patient. You want to register (large, medium and small), to eliminate the possibility of generating surplus, which is what could put the patient's health at risk during the dental consultation.

This research is the continuation of studies already carried out in some alginates, so that the test is intended to be carried out on all alginates that are sold.

**OBJETIVES**

Establish the exact dose of five different alginates, in the three sizes of Rim-Lock type impression tray (Small, medium and large) to eliminate surpluses and overflow that can generate the gag and vomiting reflex in the patient at the time of the taking the oral record of the upper jaw during the dental consultation.

**MATERIAL AND METHODS**

For the comparative study of the five alginates with the three sizes of Rim-Lock type impression tray, three groups were formed; group A = (small size U4 impression tray), group B = (medium size U3 impression tray) and group C = (large size U2 impression tray), five brands of alginates were used; Super Gazy, Kromopan from Lascod, Jeltrate from Dentsply, Tropicalgin from Zhermack, Hydrogum from Zhermack, digital scale, ml cylinder, biosecurity kit.

Initially, the weight of the cup where the alginates is mixed was determined, the result was 54 grams. This amount was taken into account so as not to be considered when determining the exact weight of the alginates. The methodology was the following; 1) The patients with jaw sizes corresponding to the small, medium and large impression tray were selected. Samples were taken from the same patient with the five alginates and different dosages. The dosages of each brand of Alginate indicated by the manufacturers were used and the records were taken with the medium impression tray because it was the average size, the overflow of the Alginate in this size was observed (Figure 1). 3) Subsequently, 3 grams of Alginate was decreased and as a rule of three to obtain the corresponding amount of water, until the correct doses were specified. 4) This procedure was performed with each of the three sizes of impressions trays (small, medium and large) and alginates five different trademarks, to determine the exact amount not generate surplus material. With this methodology, it was possible to avoid the overflow and displacement of the alginate, especially towards the

throat, in this way the risk of vomiting can be guaranteed or minimized. A total of 95 records were made. (Figure 2).



**Figure 1 Dosage indicated by the manufacturer**  
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**Figure 2 New doses to avoid alginate overflow**



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**RESULTS**

The results obtained do not correspond to those proposed by the manufacturers, in a brand they only present drawings in dispensers without proportions such as the Super Gasy Alginate, and the other Cromopan, Hydrogum, Tripicalgin and Jeltrate alginates do not mention the quantities for each size of impression trays. According to the manufacturer, the standard measure of alginate is 2 tablespoons (21mg) and 2/3 (39 ml water) dispenser for all sizes of impression trays When modifying the portions of alginate and water, for each specific impression trays.

Table 1, shows the dose set by the manufacturer in the first column and the other columns describe the exact amounts for each jaw size corresponding to the small U4, medium U3 and large U2 impression holder, with the five different ones Alginates.

**Table 1. Dose of five alginates for impression trays size**

Alginato	Manufacturer's dosage		Small U4 Powder Water	Medium U3 Powder Wáter	Large U2 Powder Wáter
	Powder	Water			
Super Gayz	Dispensers without proportions		6.5gr/17 ml	8gr/21 ml	10gr/27 ml
Cromopan	18gr/40 ml		7gr/15.5 ml	9gr/20 ml	12gr/26 ml
Hydrogum	18gr/36 ml		9gr/18ml	14gr/28ml	15gr/30 ml
Tropicalg n	42gr/39 ml		14gr/29ml	15gr/30ml	17gr/32 ml
Jeltrate	18gr/36 ml		7grs/20ml	9gr/20 ml	8gr/21.7 ml

Estrada, B (2019)

These results allowed that no surplus or overflow of the material was generated and prevented it from moving towards the oropharynx, thus avoiding exposing the integrity of the patient during this procedure in the dental office.

**CONCLUSIONS**

With the results obtained in this project, it can be shown that the general or standard dosages indicated by the manufacturers for all the impression holder sizes U4, U3 and U2 that correspond to the sizes of the jaws, are average measurements that should be reevaluated. The diffusion of these results is considered important, which is the continuity of previous publications, each time the tests are applied to more alginates until all the marks are reached to be evaluated, and the results will continue to be published to be known by the entire dental community and applied in their daily practice with the intention of eliminating the risks of vomiting and suffocation in patients and the comfort and safety of the dentist each time this clinical procedure is carried out without risks for the professional and the patient.

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