



## RESEARCH ARTICLES

### SEALANTS OR COMPOSITE?

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#### ABSTRACT

The purpose of the study is to follow the caries development for a two year period and to evaluate the dental sealants as a successful option in the treatment of occlusive cavities.

**Materials and Methods:** Our study is experimental and is conducted on children 6-11 year old. We included 144 children, where 72 of them were the group of treatment with sealants and 72 were treated with composite. The caries lesions were checked with radiography every six months for a two year period.

**Results:** The group treated with sealants with 72 children had 188 treated teeth and 100 untreated teeth, from which in treated children we noticed caries on 34 teeth and from 100 untreated teeth we noticed caries in 60 teeth. In the first group of children 32.7% of the children presented caries. In the second group of filling with composite 116 were filled with composite and 172 did not. In the subgroup of untreated children 74 children did not present caries. In the second group, the children treated with composite 25.7% presented caries and 79% of untreated children presented caries.

**Conclusions:** We cannot conclude that sealant treatment is higher in number than composite treatment. In the future it is worthwhile to go further in this study, however, as the initial treatment for prophylaxis compared with non treatment; we can say that sealant treatment reduces by half the presence of caries.

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## INTRODUCTION

The sealants of the fissures and recesses were initially proposed in dentistry at the end of 1960. They prevent the further destruction of the tooth and fillings of the tooth surface (Ahovuo-Saloranta *et al.*, 2008; Bhushan V, Gaswami M 2017; Deery C 2017; Department of oral health Sciences 2010; Department of Preventive and Restorative Dental Sciences 2001). Fissures and holes that do not clean themselves are considered property of caries (Sun HB *et al.*, 2017; Vermaire, Van Exel N 2017). Normally in these areas are collected organic waste and oral bacteria, by creating an ideal place for caries development (Arthur RA *et al.*, 2017; Albino J *et al.*, 2017; Nishi M *et al.*, 2017). The objective of sealants is to create a geometric form of the base of fissure that in itself is full of bacteria, and it prevents food collection for their growth (Keys W, Carson SJ 2017; Warren E *et al.*, 2016). Keeping in mind that sealants are not very resistant to friction, we see that it is flattened from the use of abrasive foods and in the areas of contact.

But, the main areas remain isolated really good, by resulting in positive continuous benefits (Hilgert *et al.*, 2017). The lack of knowledge on indications and effectiveness of sealants and the clinical experience of the dental doctors have raised prejudice which has had an impact on various decision making processes on the methods of sealant use. In the cases when the dentist has suspected the sealant use, the decision not to use it had resulted in an incomplete treatment. (Bhushan V, Gaswami M 2017; Chadwick BL 2017; Chestnutt IG *et al.*, 2017; Frazer RA *et al.*, 2017). Being that the dentist is not comfortable with the treatment, will offer the preventive treatment by continuing to follow the restoring method. The main principle for the sealant success is the right retention. The material of sealant should be fluent in order to fill in the fissures and holes and to have sustainability to the fractures so to resist the chewing forces and friction (Bhushan V, Gaswami M 2017; Chadwick BL 2017; Deery C 2017). Most of the fissures have a degree of macro tension, but the food waste is able to enter there, on the other hand the fluency of the sealant may be insufficient to reach the deeper parts. That's why it is required the creation of the micromechanics retention (Department of Oral Health Sciences 2010; Hilgert LA *et al.*, 2017; Keys W, Carson SJ 2017). There is data that shows that sealants may be used effectively in children, as long as the sealant is well preserved (James *et al.*, 1994; Ogretme MS *et*

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*al.*, 2016; Pahel BT *et al.*, 2017; Pitts NB *et al.*, 2017). It is important the sealant is fixed in order not to create points of pre contact or to interfere with the biting method. The success depends on the strength of the superficial layer of the sealant, and if this layer is intact there should be no reason for caries progress. Another important consideration is the level of caries risk in children (Mitchell ST *et al.*, 2017; Salas-López *et al.*, 2017). The data shows that there are two categories of patients in young age, one of them has high predisposition for caries. It is exactly this category that benefits more from dental sealants. The older patients with reduced flow of saliva are also considered candidates for sealants (Sun HB *et al.*, 2017; Warren E *et al.*, 2016).

### The purpose of the study

The goal of our study is to follow the caries development for a two year period and to evaluate the dental sealants as a successful option in the treatment of occlusive cavities.

**Table 1. The group of children treated with sealants developed caries in 32.7%**

| Treated children  | Teeth | Caries | Sealants | Healthy teeth | Caries total | Caries % |
|---|-------|--------|----------|---------------|--------------|----------|
| Sealants  | 188   | 34     | 52       | 102           | 34           |          |
| Untreated teeth with sealants, follow up in 6,12,18,24 months | 100   | 78     | 0        | 40            | 60           | 32.7%    |
|   |       | 58     |          |               |              |          |
|   |       | 40     |          |               |              |          |

**Table 2. 34 teeth which in the initial moment were treated with sealants and developed caries were filled with composite**

| Month | 6 | 12 | 18 | 24 | Total |
|-------|---|----|----|----|-------|
| Teeth | 2 | 11 | 7  | 14 | 34    |

**Table 3. The group of children treated with composite developed caries in 25.7%  
 $X+2Y=11$ ,  $X+Y=7$ ,  $X=3$ ,  $Y=4$**

| Children  | Teeth | Retreated teeth with composite | Good condition teeth in the radiography | Caries | Caries % |
|---|-------|--------------------------------|---|--------|----------|
| Treated with composite                                      | 116   | 11                             | 105                                     | 0      |          |
| Untreated, the progress with caries every 6,12,18,24 months | 172   | 0                              | 74                                      | 162    | 25.7%    |
|   |       |                                |   | 150    |          |
|   |       |                                |   | 135    |          |
|   |       |                                |   | 98     |          |

**Table 4. The group of children without any treatment developed caries in 79%**

| Months | Caries | Caries ne % | Total caries in children with no treatment |
|--------|--------|-------------|--|
| 0      | 0      | 0%          |  |
| 6      | 86     | 29%         | 79%  |
| 12     | 60     | 29%         |  |
| 18     | 38     | 23%         |  |
| 24     | 43     | 35.5%       |  |

## MATERIALS AND METHODS

Our study is experimental, and is conducted on children 6-11 year old. We included 144 children, where 72 of them were the group of treatment with sealants and 72 were treated with composite. The teeth with deep fissures and early signs of caries without dentine destruction were treated with sealants. In the group of sealants, the tooth was isolated with dental cotton. The surface was acidified, dried, and bonded. The sealant was applied and we polymerized it. Before the child left, we made sure for a good retention and polymerization of the sealant. The parent was informed that the treatment would be checked in the following visit.

The composite fillings were applied to the teeth where the caries had developed within the dentine. We checked the treatment with an oral radiography (bite wings) to see if there was a progress of the caries every six months for a two year period.

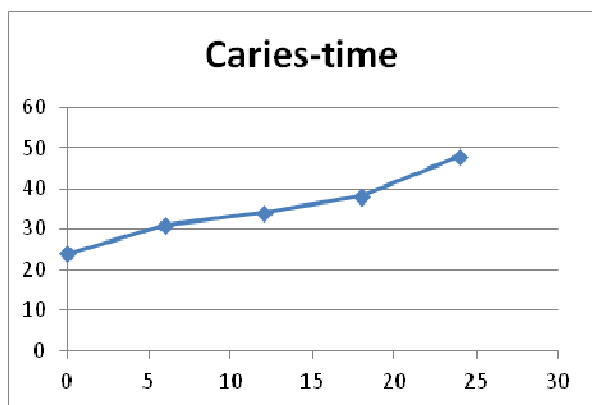
## RESULTS

The results of 72 children in the group treated with sealant . The progress of caries in teeth treated with sealants, in which we had to apply fillings, is as follows: In the second group, 72 children treated with composite were as follows: There were 3 children with one tooth to retreat, and 4 children that the filling had fallen and had to be refilled. Children of the age 6-11 without any initial treatment (for the study effect):

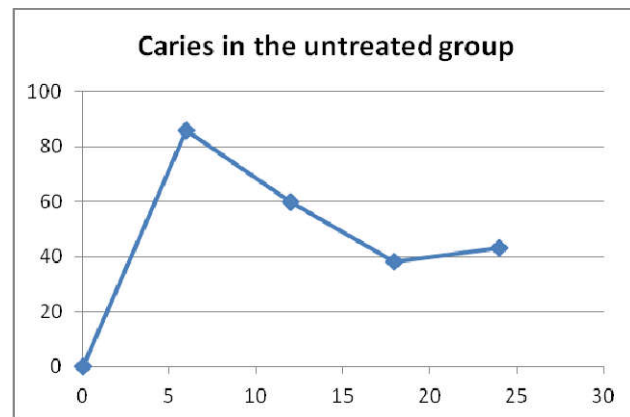
## DISCUSSION

Today in the world it is discussed on the prophylaxis of caries in children 6-11 years old and we focused in this age group.

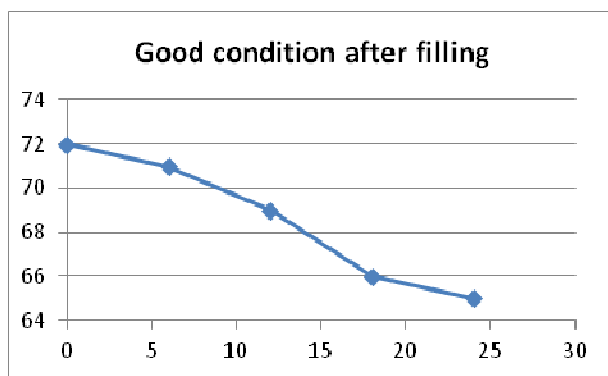
In addition to many other prophylaxis treatments in the clinics, today we are discussing the treatment with sealants in the prophylaxis study we preferred to treat 72 children of the size 188/288 and thus 65% of the teeth number 6. To draw precise conclusions on the effectiveness of this treatment, we also worked on 72 children. We performed 116 fillings on them because they had decay and the third group consisted of 72 children who initially were healthy and did receive any treatment. It was noted that children treated with sealants developed caries at 32.7%, children treated with the composite developed caries at 25.7%, children without any treatment developed caries at 79%.



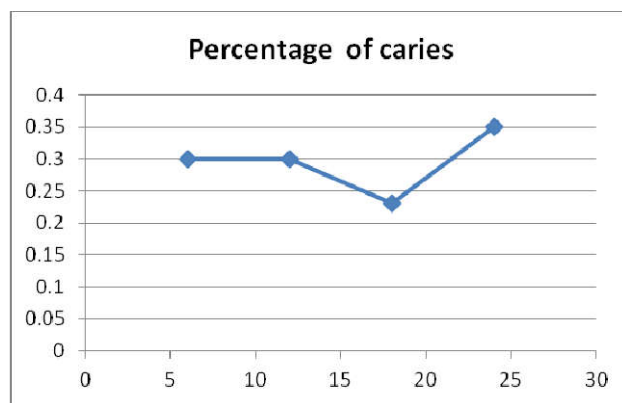
**Graphic 1:** The dependency of the caries to time is direct; there is an increase of caries with the passing of time average= 35, SD= 8.88



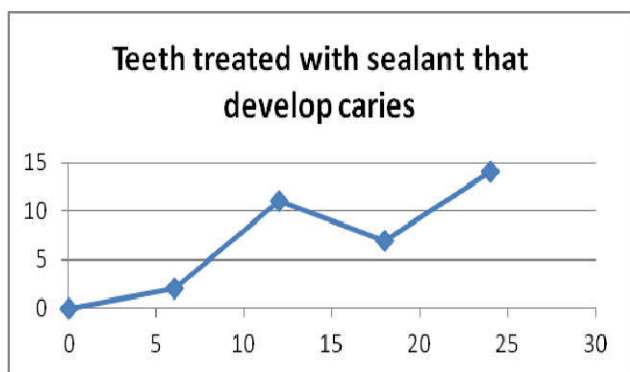
**Graphic 5:** The ordinate axis shows the presence of caries and the abscissa's axis the time of visit and fillings average =48, SD=31.55



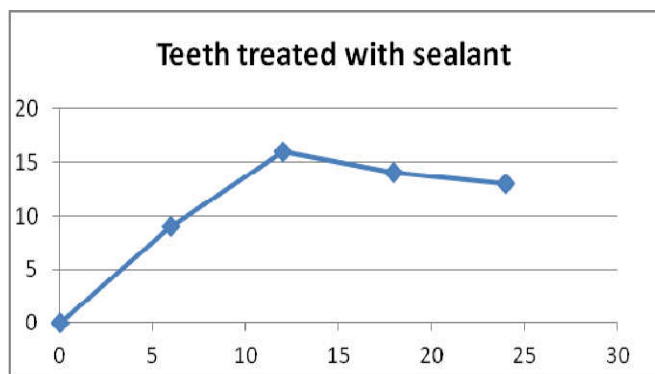
**Graphic 2:** It is seen a good condition of the filled teeth depending on time, the graph shows that there are 65 healthy teeth remaining average= 68.6, SD=2.75



**Graphic 6.** A presentation of the caries every six months average =29.5%, SD=4.93



**Graphic 3:** A presentation of the teeth treated with sealants that develop caries average=6.8, SD=5.89



**Graphic 4:** Teeth retreated with sealants average=10.4, SD=7.13

Data showed that sealants are effective in children with high risk of caries (Bhushan V, Gaswami M 2017; Chadwick BL 2017; Chestnutt IG *et al.*, 2017; Frazer RA *et al.*, 2017; Deery C 2017). A study revealed that the indications for sealing the fissures vary considerably (Department of Oral Health Sciences 2010). The data on the effectiveness of sealants in caries of the posterior teeth emphasizes that sealants need to be used in the treatment of the caries of the recesses and grooves (Frazer RA *et al.*, 2017; Deery C 2017). It is necessary to discuss the weaknesses of this study. We needed to include a bigger sample of children in the study and the time period should have been longer. All the information about sealants was given to the children's parents. They showed interest and expressed the desire to apply sealants to their children. For low-income households, sealants were considered a luxury.

### Conclusion

We cannot conclude that sealant treatment is higher in number than composite treatment. In the future it is worthwhile to go further in this study, however, as the initial treatment for prophylaxis compared with non treatment; we can say that sealant treatment reduces by half the presence of caries. Despite the fact that the fillings had better resistance and offered more possibilities for stopping dental caries, dentists should consider the use of sealants in these lessons as the tooth would be more preserved.

### Conflict of interest

All of the authors declare they have no conflicts of interest.

## Ethical approval

This article contains studies with human participants and we get permission from the children's parents.

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