

Allergenic Potential Evaluation of Acrylic Resins from the Complete Prosthesis

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The objective of this study is to compare the results obtained while determining the amount of residual monomer in three samples of acrylic resin in the first 24 hours after getting done the prostheses in the dental lab with the results of patch-tests performed on three subjects, after they have worn dentures for three months.

Keywords: patch-test, acrylic resin, residual monomer, allergenic potential

The residual monomer is one of the factors with the highest allergenic potential for acrylic resins. The amount of residual monomer is ideally measured within the first 48 hours. Instead, the patch-tests reveal the body reactivity to a certain allergen.

Experimental part

To evaluate the allergenic potential of acrylic resins, was used both the determination method of residual monomer [1-3] amount and the patch-tests to emphasize the reactivity of three subjects after they have worn their dentures for three months.

Materials and method

The epicutaneous tests (patch-tests) consist in applying some patches on a free-rash tegument and off the rash-periods, patches that contain fragments [1-3] (for the test in the present study, square-shaped) dipped in supposedly antigenic substance, then maintaining them in contact with the skin for 48 h.

The testing area is the mid upper back, anterior sides of the forearms and supero-external region of the arms, especially if strong reaction is anticipated. The testing time is 48 h. There are some cases when 48 h are not enough to acquire a relevant result. In this situation, the testing area needs to be marked with a ballpoint pen or fluorescent UV marker.

The patient must to maintain the tests dry, adherent; for this, he has to cut off having a shower, physical activities involving sweating through effort, to avoid scratching the testing area and UV radiation [4-6].

For testing was used the IQ ULTRA CHAMBERS BOX tests, where was added MMA as an allergen.

Volatile components content method

There were used three acrylic polymer samples [7-9], each one being harvested from three totally different prostheses. The samples were preconditioned at 80°C for two hours to remove water and then weighed.

P1: 0.7863 g

P2: 0.05638 g

P3: 0.8421 g

It was used a Petri dish/ box with a 7 cm diameter.

It was sterilized in the oven at 150°C for one hour. Then it is carefully taken out without touching it directly and weighed on the analytical scale with high precision.

In the box it is added 2.1 g of product, which was previously preconditioned to 80°C for two hours to remove water, and it is weighed again very accurately. The assembly will be kept in the oven for 10 h at 150°C, after which it will be weighed again, also very precisely.

The weight difference is given by the amount of existing residual monomer.



Fig. 1. Reactions of MMA



Fig. 2 Patch test IQ ULTRA CHAMBERS BOX

Results and discussions

After 10 hours at 150°C the samples were weighed:

P1: 0.7863g

P2: 0.5638g

P3: 0.8421g

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By this method was not noticed any damage of the polymer; weight loss was in all the three cases of 0.0000 g. All the three subjects have shown tenderness (sensibility) to MMA.

For the samples of thermo-baro-curing acrylic resin of partial and total prostheses bases, we did not find residual monomer of order 0.0000g.

At *in vivo* tests, the subjects presented a high rate of sensibility to MMA.

We can not declare that there is no residual monomer in the acrylic resin samples, but only that is less than 0.0000g order. Since the patch-tests showed positive results, we can conclude that there is residual monomer.

Conclusions

It is satisfactory that 24 h after accomplishing the technological process of prostheses considered in the present study [10-12] the amount of MMA is very small, almost undetectable by normal methods.

Although the amount of residual monomer is less than 0.0000g, however there is a certain sensibility to MMA in the tested subjects, which means that although we are dealing with a very small amount of residual monomer, it still exists and is sufficient to trigger allergic reactions.

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