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Research Article

**EVALUATION OF THE IMPACTS OF SANOSIL
DISINFECTANTS ON DIMENSIONAL STABILITY OF
IMPRESSION MATERIALS****Dr Azam Shahzad, Dr Zohaib Ahmad, Dr Muneeb Shaikh**¹Prosthodontics, Senior Registrar, Shahida Islam Dental College, Lodhran, Pakistan²Restorative Dentistry, Senior Registrar, Shahida Islam Dental College, Lodhran, Pakistan³Orthodontics, Lecturer, Dow Dental College, Dow University of Health Sciences, Karachi, Pakistan**Abstract:**

Objectives: For the prevention of the transmission of diseases, control of the infections in dental offices without decrease in the accuracy, preciseness and dimensional stability of the impression materials is much vital. The purpose of this research work was to assess the impacts of disinfectants of Sanosil on dimensional stability of various standard impression materials.

Methodology: In this current research work, we used three types of impression materials whose names are alginate, polyether and condensation silicone. We obtained the impressions with the utilization of the master steel model. We immerse 15 impressions of every material Control Group for 10 minutes in the water and the disinfection of the impressions of study groups was carried out with their immersion in 2.0% Sanosil for complete 10 minutes. After that we poured the impressions by Type-3 gypsum in accordance with the instructions of manufacture. We used the digital caliper for the recording of the cast's dimensions in 2 anterior dimensions, for example, interval among anterior posterior abutments and interval among anterior abutments. The accuracy of the digital caliper was 0.010 mm. We used the SPSS software for the statistical analysis of the collected information with the help of two-way ANOVA test method.

Results: The findings of this research displayed that there was no important disparity in the average casts' dimensions by various impression materials in the anterior-posterior as well as anterior dimensions as compared to the original model after the disinfection with the use of Sanosil.

Conclusions: This current research work discovered that disinfection with the utilization of 2.0% Sanosil has no significant impact on the dimensions of casts of alginates, polyether & silicone as well as their impression and dimensional stability is well-maintained.

KEYWORDS: Sanosil, Immersion, Disinfection, Condensation Silicone, Original Model, Dimensions, Polyether.

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INTRODUCTION:

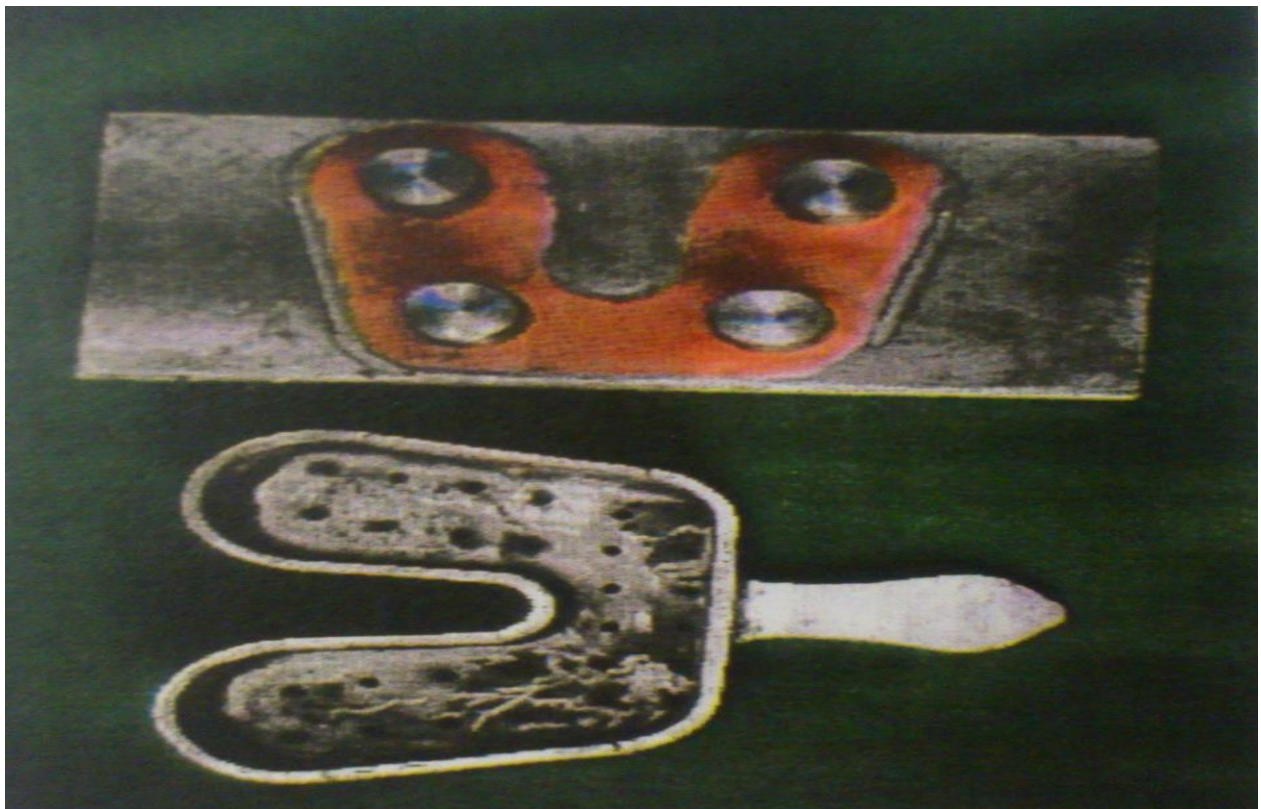
Accuracy of the dimensions in the duration of making impressions is much critical. It is much important in maintaining the quality of fixed prosthodontic therapy and most critical factor influencing the impression technique [1]. There is significant role of the accurate and precise impression in the success of therapy. Preparation of models and impression for achieving the maximum adaptation are most important factors that can have impacts on the outcomes [2]. If there is no reconstructing of the mouth of patient with the final cast, it causes improper prosthetic adaptation and directs repetitive impressions [3,4]. It causes the increase in the number of visits and total expense of cost [5].

Sanosil Company which is located in Zurich, Switzerland has discovered the Sanosil disinfectant which is an anti-septic agent made up of silver and H₂O₂, manufacturer asserts that this very element is non-toxic and there is decrease in its

effectiveness by only 1.0% after completing one year [6,7]. One research work on the impacts of this very substance discovered that when it is use as a spray, there is no corrosive effect of this component and there is no remnant of this material on devices as well as instruments [8]. There is existence of some research works on this material. This current research work was carried out to assess the impacts of Sanosil on the dimensional stability of different impression materials as silicone, alginate and polyether.

MATERIAL AND METHODS:

In this current research work, we designed a master model which contain a metal plate [9] in form of the dental arch containing of abutment and 2 other slot guides with four millimeters length and depth of one millimeter (Figure-1). A tray of stainless-steel tray with 2 prominences was formed in accordance with the size of metal plate's slot. Abutments intervals are present in Figure-1.



A shrinkage of small size with 6° taper and a total 22° to vertical axis and formation of the crossover groove were carried out on the abutment's occlusal surface. Preparation of this junction was carried out as reference point to calculate the interval of abutments. On the center region of every abutment, preparation of the circular groove with 0.50 millimeters depth was carried out for the measurement of the abutment's diameter. We made thirty impressions for every group (Total =90) and we divided every group in two subgroups with 15 impressions in accordance with the types of the techniques of disinfection as immersion and control groups (Figure-2).



Fig: 2

The preparation of the alginate impressions was carried out by chromatic alginate in accordance with the instructions of manufacturer. Working, setting & mixing lasted about 1.35, 2.35 & 45.0 seconds at room temperature of 23 °C. Ratio of water to powder was 36 milliliters to 18 grams for the preparation of the impressions of medium sizes. The preparation of the silicone impressions was carried out with the help of condensation silicone following the instruction of manufacturer. The preparation of the polyether impressions was carried out with the utilization of the Impergum. The modification in the original model was performed to rise the preciseness of the polyether impression. In start, we placed a two-millimeter wax between abutments and then coping with two-millimeter thickness was utilized on the surfaces of abutments. We made some alterations in the special tray for the provision of maximum space of two millimeters and to rise the accuracy of material of polyether impression. We sealed the holes present in the tray with help of wax & acrylic resin that were prepared as well as placed into tray. We did the impression of master model using same acrylic resin in dough stage and before completion of its

setting. There was double setting time in this research work.

We performed the process of disinfection for all groups except group of controls and we immersed the impressions in 2.0% Sanosil solution for 10 minutes and after washing with the help of this disinfectant, we left the impressions to dry at normal room temperature. We purred the impressions with the utilization of the Type-3 gypsum according to the instructions of manufacturer; initially, addition of the pre-weighed powder of gypsum was carried out to water and completely mixed (This very ratio was five tablespoons (20.0 grams) of powder to 15.0 milliliters of water). After its placement on the vibrator, pouring of gypsum was carried out into impression and then removed after completing sixty minutes and then coded. After completing one day, researcher measured the dimensions of every sample with the utilization of the digital caliper having an accuracy of 0.010 mm. Then, calculations of intervals of anterior as well as anterior-posterior abutments were carried out (Figure-3).

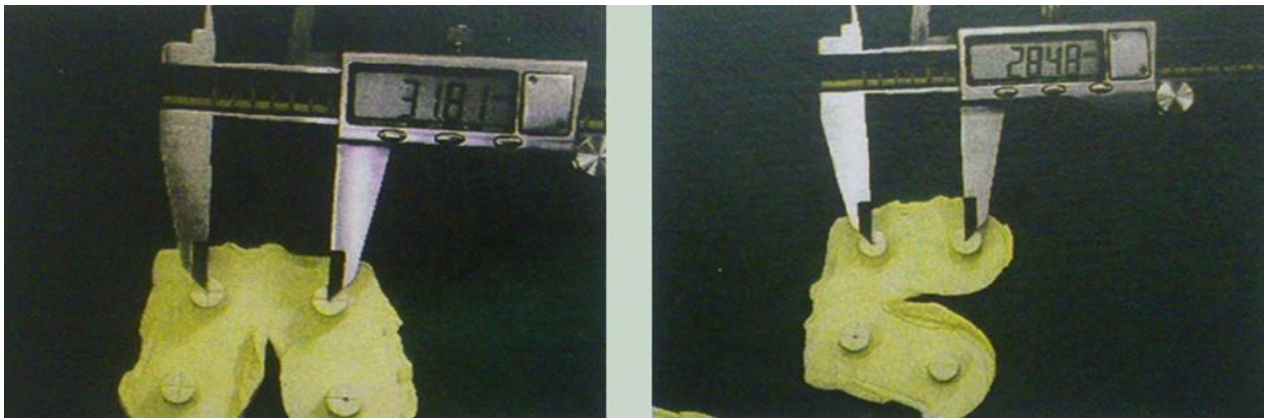


Fig: 3

To attain the preciseness of the measurement, we measured the laboratory models and samples of gypsum for 3 times and we considered the mean value as the final result. After the measurement of the interval among abutments, we compared the data with master model. Interval among anterior abutments was 32.0 mm and interval among the anterior-posterior abutments was 28.0 mm) as presented in Figure-4.

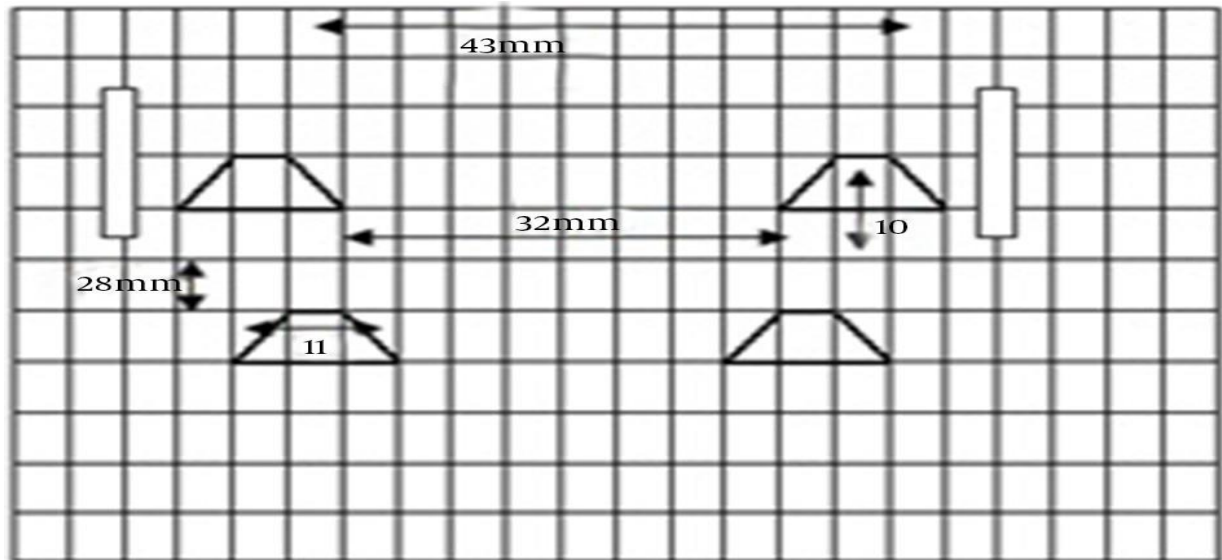


Fig: 4

RESULTS

The analysis of the collected data was carried out with the utilization of two-way ANOVA test which stated that as compared to the original model, we found no statistical significant difference in average casts' dimensions which were prepared by various impression materials in anterior-posterior & anterior (P =0.6520 & 0.7160 respectively) dimensions after disinfecting with the utilization of Sanosil. Table-1 shows the average interval between anterior abutments in every group.

Comparison Group	Mean \pm SD, mm
Alginate Control Group	31.978 \pm 0.153
Alginate Disinfected Group	32.022 \pm 0.114
Silicone Control Group	31.967 \pm 0.292
Silicone Disinfected Group	31.920 \pm 0.236
Polyether Control Group	31.900 \pm 0.340
Polyether Disinfected Group	31.928 \pm 0.128
Standard Model	31.958 \pm 0.005

a P Value = 0.716; and F = 0.580.

Table-2 shows the average calculated interval between the anterior-posterior abutments of various groups with complete details.

Comparison Group	Mean \pm SD, mm
Alginate Control Group	28.473 \pm 0.208
Alginate Disinfected Group	28.408 \pm 0.191
Silicone Control Group	28.390 \pm 0.150
Silicone Disinfected Group	28.432 \pm 0.182
Polyether Control Group	28.406 \pm 0.166
Polyether Disinfected Group	28.362 \pm 0.172
Standard Model	28.397 \pm 0.001

DISCUSSION:

In this current research work, we used the immersion technique for the impressions' disinfection. Although there might be negative

impact of Sanosil on the stability of dimensions of impressions, there is preference of spray method on this very method; however, there is need of more research works for the determination of the impact

of Sanosil with the utilization of spray techniques [10]. This finding showed that there was no important alteration in the anterior-posterior and anterior dimensions in immersing of the polyether, alginate and silicone in 2.0% Sanosil for complete 10 minutes. There is recommendation from the manufacturer of Sanosil to immerse for 20 to 30 minutes; so, lack in the changes of dimensions in the duration of immersion is possibly because of the low time of immersion [11,12]. There are much limited research works that have examined the impacts of Sanosil on the stability of dimensions of the impressions. Lavaf assessed the impacts of 2.0% deconex & 10.20% Microon on dimensional stability of impression method of alginate and discovered significant alterations as compared to the changes after the application of the master model ($P < 0.050$) [13].

According to the findings of one other research work conducted by Craig & Wataha, immersion in the 0.10% sodium hypochlorite & 2.0% glutaraldehyde resulted important changes in dimensions as well as much distortion in the impression of alginate [14,15]. When comparing these two research works with the current research work, it seems that there is high effectivity of Sanosil in maintaining the dimensional stability of different impressions as compared to the other disinfectants; however, it is much superior to assess the other concentrations of the Sanosil in that very regard. This current research work investigated only the Sanosil with a concentration of only 2.0%. The results of this research work are much consistent with the results of research work conducted by Bergman [16,17,18], Rueggeberg and Dandakery; however, all of these research works utilized the spray method, therefore, there are many differences between those studies and this current research work.

CONCLUSION:

In accordance with the results of this research work, disinfecting with the utilization of 2.0% Sanosil by duration of immersion as 10 minutes has no important impact on the dimensional stability of various dental impressions in anterior-posterior & anterior impression's dimensions.

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