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RESEARCH ARTICLE

EFFECT OF TWO-DISINFECTION TIMES ON DIMENSIONAL ACCURACY OF VINYL POLYSILOXANE IMPRESSIONS.

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Abstract

Purpose: To evaluate linear dimensional changes of vinyl polysiloxane impressions after immersion disinfection.

Materials and Methods: A standardized steel master cast fabricated to provide dental replica of two teeth prepared for complete crown with 10-degree convergence one represent canine and other represent molar with edentulous interposed space 42.1 mm. Auto polymerized resin perforated custom tray with 2 mm spacer constructed from master cast. The trays painted with adhesive, and allowed to dry for 60 seconds before obtaining the impressions. Regular body vinyl polysiloxane impression material (Elite HD+ regular body zhermack) used for fabrication of 30 impressions. A 20 impressions act as control (10 of them left in atmosphere for 30, 60 minutes and other 10 immersed in distilled water for 30, 60 minutes before pouring). Other 10 impressions (test group) immersed in a glutaraldehyde disinfectant solution (MD 520 impression disinfection) for 30 and 60 minutes. All impression poured with extra hard dental stone. Obtained casts evaluated for linear dimensional changes using a digital caliper. Data tabulated and statistically analyzed using one-way analysis of variance with a significance level set at $\alpha = 0.05$.

Results: The highest dimensional change value was recorded after immersion impressions in distilled water for 60 minutes while, the lowest value was recorded after immersion in disinfectant solution for 60 minutes. There is no significant difference in dimensional changes between control groups and test group at both immersion times.

Conclusion: Under the limitations of present study, tested disinfection times (30 minutes & 60 minutes) has no effect on dimensional accuracy of tested impression material.

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Introduction:-

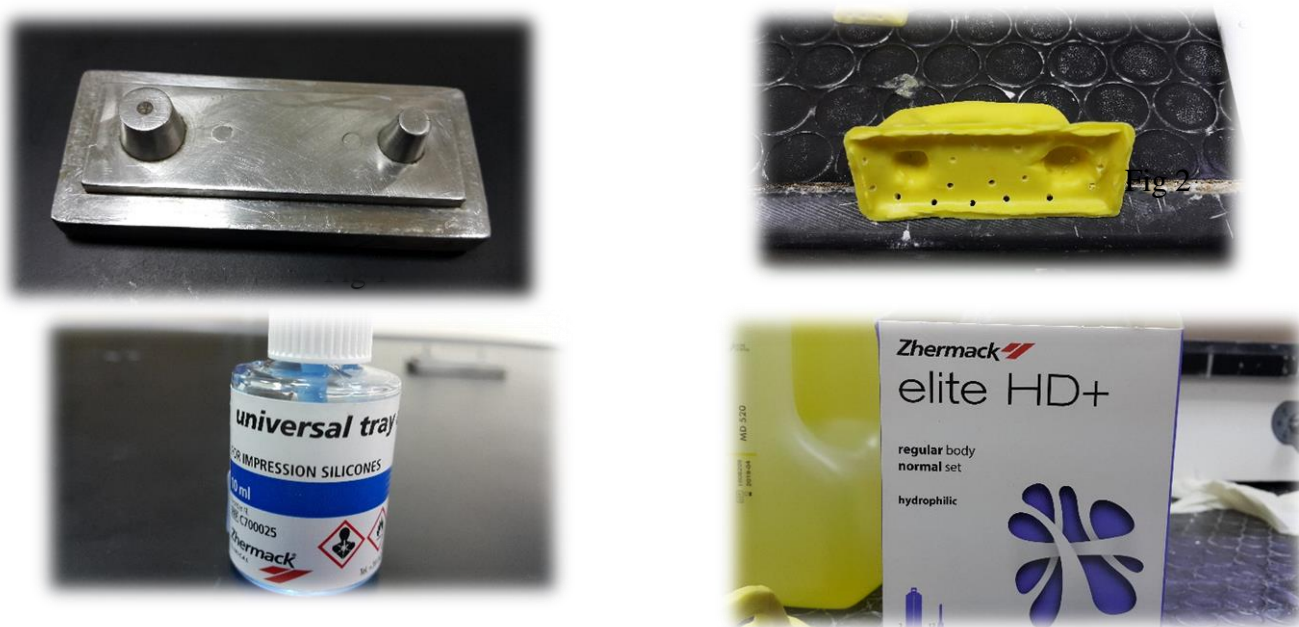
One of the most important factors in the production of an accurate dental prosthesis is the use of a suitable impression material. There is a continuous effort to improve materials used to achieve dimensional stability precision and fine tissue details. Contamination of dental impressions with oral cavity fluids including saliva and blood occurs readily in dental clinics. Mere washing of the impression does not clear away all the micro-organisms. These contaminated impressions may result in cross-infection from the patient to dentist or dental assistant or more

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importantly, laboratory technician therefor, it is necessary to adopt the disinfection of dental impressions as a mandatory procedure in dental practice. In pursuit to achieve the goal of disinfection for the protection of the dental team, it is must and necessary that accuracy and dimensional stability of impressions not be compromised. Several studies investigated the accuracy and dimensional stability of vinyl polysiloxane impression materials under different test conditions such as different levels of humidity, storage temperature and the effect of prolonged storage. The aim of our study is to evaluate linear dimensional changes of vinylpolysilixane impressions after immersion disinfection.

Materials and Methods:-

A standardized steel master cast fabricated to provide dental replica of two teeth prepared for complete crown with 10-degree convergence one represent canine and other represent molar with edentulous interposed space 42.1 mm {1}. Auto polymerized resin perforated custom tray with 2 mm spacer constructed from master cast {2}. The trays paints with adhesive, and allowed to dry for 60 seconds before obtaining the impressions{3}. Regular body vinylpolysilixane impression material (Elite HD+ regular body zhermack) used for fabrication of 30 impressions {4}. A 20 impressions act as control (10 of them left in atmosphere for 30, 60 minutes and other 10 immersed in distilled water for 30, 60 minutes before pouring). Other 10 impressions (test group) immersed in a glutaraldehyde disinfectant solution (MD 520 impression disinfection) for 30 and 60 minutes. All impression poured with extra hard dental stone. Obtained casts evaluated for linear dimensional changes using a digital caliper. Data tabulated and statistically analyzed using one-way analysis of variance with a significance level set at = 0.05.

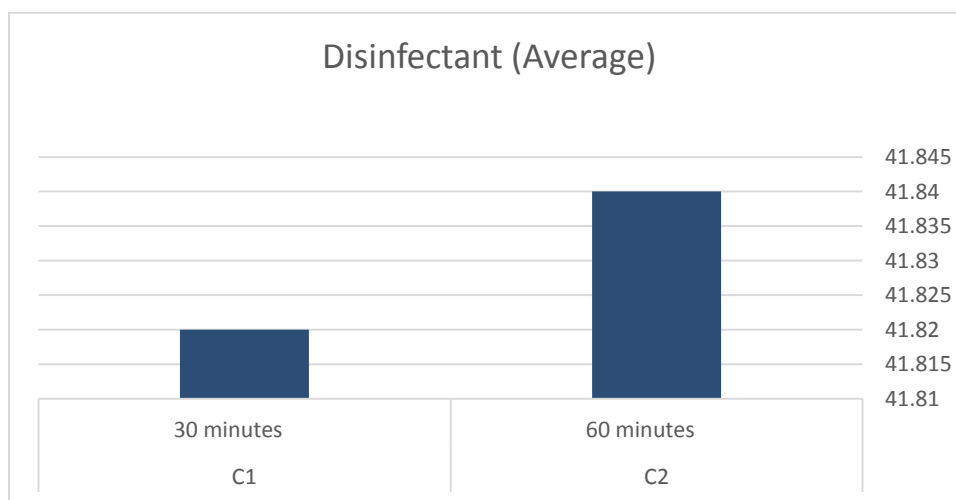
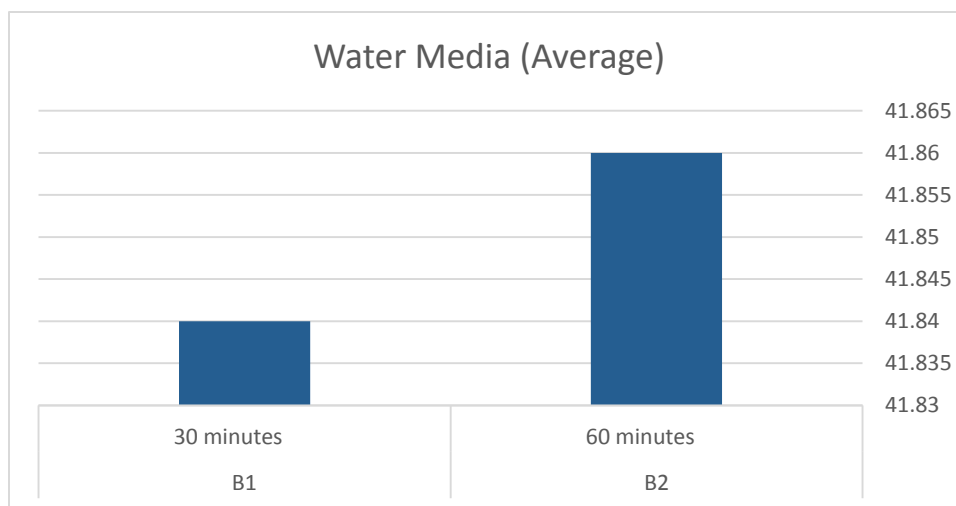
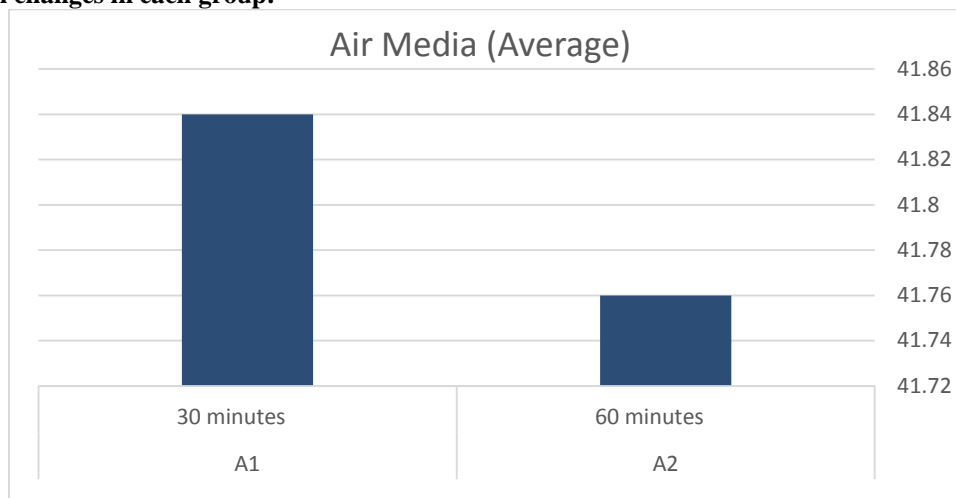


Results:-

The highest dimensional change value was recorded after immersion impressions in distilled water for 60 minutes while, the lowest value was recorded after immersion in disinfectant solution for 60 minutes. There is no significant difference in dimensional changes between control groups and test group at both immersion times.

Stander model: 42.1mm

Group	A1	A2	B1	B2	C1	C2
Time	30 minutes	60 minutes	30 minutes	60 minutes	30 minutes	60 minutes
Sample 1	42	41.7	41.9	41.9	41.9	42
Sample 2	41.9	41.7	41.9	42	41.9	41.8
Sample 3	41.8	41.8	41.7	41.7	41.8	41.7
Sample 4	41.9	41.9	41.8	41.8	41.6	41.9
Sample 5	41.7	41.7	41.9	41.9	41.9	41.8

Dimentional changes in each group:

Discussion:-

Contamination of dental impression with alter amounts of blood and saliva is a routine incident in dental clinics therefore, every impression must be undergo surface disinfection treatments before further processing⁵. According to the information provided by the center of disease control, chemical disinfectants such as chlorine compounds, formaldehydes, glutaraldehydes, phenol and iodophers have the potential to destroy hepatitis, herpes and AIDS viruses in 10 to 30minutes. Also Through a questionnaire addressed to dental technicians, Jagger et al. found that only 4% of the laboratories received disinfected impressions, whereas 56% of the laboratories did not know if impressions coming from the dental offices had been previously disinfected. Therefore, most of the laboratories (94%) usually disinfected the impressions they received⁶. This study evaluated and compared the dimensional changes of vinylpolysilixane impression material (Elite HD+ regular body zhermack) as a result of impression subjected to 3 different media (air, water, disinfectant) at 30 and 60 minutes times immersion for each. We can see in the Air group (control) impressions left for 30 minutes more close to the standard dimension than the impression at 60 minutes by (0.26mm). For water media the impression at 60 minutes was less than standard dimension by (0.24mm). Finally in disinfected media (glutaraldehyde disinfectant solution) the impression at 60 minutes less than standard dimension by (0.026mm) and at 30 minutes by (0.028mm). Chemical disinfection produced minimal dimensional changes compared to other two methods. Tullner et al observed no clinical significant dimensional changes with disinfection using 2% glutaraldehyde in his study.

Conclusion:-

Under the limitations of present study, tested disinfection times (30 minutes & 60 minutes) has no effect on dimensional accuracy of tested impression material.

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