Reg. No: RJ17D0105798 ISSN No:2582-0362

HEB JOPD

Journal of Prosthodontics Dentistry
An Official Publication of Bureau for Health & Education Status Upliftment
(Constitutionally Entitled as Health-Education, Bureau)

A comparative assessment of dimensional accuracy of new generation alginates: an in-vitro study

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Abstract

Aim:- To assess and compare the dimensional accuracy of new generation alginate impression materials with an elastomeric impression material.

Materials and Method: - Two alginate impression materials, Millenium Type I and Kromopan Type II (Lascod, Italy) were compared with an elastomer, polyvinylsiloxane (Aquasil). Impressions were made using a standardized stainless steel die as per ADA specification number 19. A specially designed stock-perforated tray that fits around the borders of a mould was used to make impressions. All the impression materials used in this study were mixed according to manufacturer's instructions. 80 impressions were made with each materials. Sample size was divided into four groups each containing 20 impressions. Group 1 was poured immediately after making impressions using type IV gypsum, Group II, GroupIII and Group IV were poured after 24-25 hours, 49-50 hours and 99-100 hours respectively. The impressions were stored in safe- lock bags / sealed plastic bags. Numeric coding was done to identify the samples. Measurements were made using a Travelling Microscope.

Results:- There was no statistically significant difference observed between the three impression materials with respective to mean dimensional change when poured immediately at 24-25 hours, at 49-50 hours and at 99-100 hours except for Kromopan type II at 99-100 hours which was found to be statistically significant. No statistically significant difference between Millenium type I and polyvinylsiloxane.

Conclusion:- With immediate pouring the three impression materials exhibited very minimal dimensional changes. Greatest accuracy was observed with polyvinylsiloxane followed by Millenium Type 1 and Kromopan Type II being the least accurate. Delayed pouring could be considered, if the alginate impression materials were stored in sealed plastic bags. For optimum dimensional accuracy the impressions must be poured immediately.

Key words: alginate, dimensional accuracy, elastomer, safe-lock bag, travelling microscope.

Access this Article Online	Quick Response Code:
Website:http://heb-nic.in/jopd	
Received on 30/07/2023	
Accepted on 11/08/2023	