Dimensional Stability of Impression Materials Disinfected by COEfect™ MinuteSpray

Kuei-Ling C. Hsu¹,², Louis DePaula³, Mary Anne S. Melo¹,²

¹ PhD Program in Biomedical Sciences, University of Maryland School of Dentistry, Baltimore, MD 21201, USA
² Division of Operative Dentistry, Department of General Dentistry, University of Maryland School of Dentistry, Baltimore, MD 21201, USA
³ Division of Pediatric Dentistry, Department of Orthodontics, and Pediatric Dentistry, University of Maryland School of Dentistry, Baltimore, MD 21201, USA

INTRODUCTION

• Disinfection of clinical infected materials is a part of important and necessary steps for proper infection control protocol in dentistry.
• Spray surface disinfectant is commonly used to disinfect impression of fixed and removable prosthesis. A few commercial surface disinfectants are available to use in dental impression. However, the effect of these surface disinfectant in dimensional and morphological changes are yet to be determined. Example of the content in these disinfectants is listed below.

MATERIALS AND METHODS

• Two types of impression materials were evaluated: alginate and polyvinyl siloxane (PVS).
• Four one-step spray antimicrobial disinfectants (BirexSE®, Opti-Cide3®, COEfect™ MinuteSpray, Cavicide®) along with control (distilled water) were used to disinfect the edentulous impression by both materials according to the manufacture instruction. Procedures were repeated in triplicates.
• To evaluate the dimensional stability, the impression was scanned before and after disinfectant spray by a CBCT scanner (Carestream 9300, Atlanta, GA) and resolved to a 3D positive image using related Kodak software. Linear measurement were obtained on the digital model using 3 fixed reference points. ANOVA one-way and Tukey test were used to analyze the difference of linear changes for each disinfectant. Significant level was set at p<0.05.
• To evaluate the surface quality of the impression, a representative specimen of each group were prepared and examined with electronic scanning microscopy (SEM). All specimens were examined under an FEI Quanta 200 operating at 25kV and X500 magnification.

RESULTS

Dimensional Stability

Surface Quality

Fig. 5: Mean and standard deviation of dimensional differences of dental alginate subjected to disinfection with different disinfecting solutions. The horizontal line indicates that all five groups had a similar dimensional difference (p>0.5).

Fig. 6: Mean and standard deviation of dimensional differences of polyvinyl siloxane impression material subjected to disinfection with different disinfecting solutions. The horizontal line indicates that all five groups had a similar dimensional difference (p>0.5).

Fig. 7: SEM micrograph of dental alginate and polyvinyl siloxane impression material subjected to water (control group) and COEfect™ Minutesspray, respectively, presenting no morphological alterations (x 500).

CONCLUSION

• Disinfection of the impressions by the tested commercially available disinfectant solutions did not yield significant linear dimensional changes in dimensions and morphological alteration of the used dental alginate and polyvinyl siloxane impression material.
• The disinfection of impression materials frequently used in the dental clinical procedures such alginate and polyvinyl siloxane impression material can be performed without detrimental to the dimensional stability of the material.

ACKNOWLEDGEMENTS

• This project is supported by GC America Inc. USA.