

Original Research

A clinical study to evaluate effectiveness of Denture Adhesives for dentures

Sapanpuneet kaur ¹

National dental college Derabassi, Gulabgarh, Punjab, India

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ABSTRACT

Background: This article is meant to be useful contribution to the understanding of effectiveness of commercial complete denture adhesives. Dental adhesives are used in prosthodontics to provide a binding layer on the surface of complete dentures. It is thought that dentist need to know more documented, well organized details about these adhesives in order to be able to educate all denture patients about advantages, disadvantages and use of such products. Denture adhesive when use properly are safe and benefit to the patient in improving retention and stability, incisive ability, comfort, function, and in providing psychological security.

Materials and Methods: The present study was conducted in the lifestyle dental clinic, Chandigarh. It comprised of 96 complete denture wearer patients. Three denture adhesives were divided into group A (Fiftydent), group B (Protefix) and group C (Coreg denture adhesives). Each group had 24 complete dentures. Group D comprised of control (No adhesive).

Results: Group A had mean value of (8.21N), group B (5.14N), group C (4.25N) and group D had (3.81N). The difference was significant.

Conclusion: It was found that the use of denture adhesives improved the retention. The maximum retention strength was found with Fiftydent denture adhesive as compared to others.

INTRODUCTION

Successful complete denture therapy involves both technical excellences during prosthesis fabrication and effective patient management once the dentures are placed. Satisfying the expectations of many patients for optimal denture retention and stability is often beyond the technical skills of even the most accomplished practitioners. Discussing and implementing the judicious use of denture adhesives may satisfy patient's expectations and achieve the intended treatment goals. It is thought that dentist need to know more documented, well organized details about these adhesives in order to educate all denture patients about the advantages, disadvantages and use of such products[1].

One of the main problems posed by complete dentures is retention and stability of the mandibular dentures. In order to solve this problem, dentists and the dental industry for a long time have attempted to improve

denture adhesion by developing a range of "glues" of highly varied composition and efficacy.[2] Dental adhesives are used in prosthodontics to provide a binding layer on the surface of removable complete dentures, thus allowing the latter to adhere to the supporting tissues of the edentulous patient. Even the most accomplished practitioners find difficulty in satisfying the patient's expectations for stability and retention of the denture and it is often considered appropriate to prescribe a denture adhesive. Denture adhesives may also give psychological confidence for the patient as it supplements retention and stability especially during occasions of public interaction. [3]

The ideal requirements of a denture adhesive are":

1. Physically it should be in a powder, gel or cream form.
2. It should be non toxic, non irritant and it should be bio-compatible.
3. It should be odour less and tasteless.

* Corresponding author: **Sapanpuneet kaur**, National dental college Derabassi, Gulabgarh, Punjab, 140507, India. Sapanpuneetkaur07@gmail.com

4. It should be easy to apply on the tissue surface of the denture.
5. It should not promote microbial growth.
6. It should possess retentive adhesive qualities for longer period (12 - 16 hours).
7. It should provide comfort, retention and stability during functions.

MATERIALS AND METHODS

The present study comprised of 96 complete denture wearer patients. Data such as age, gender etc. was recorded in performa. A written informed consent form was given to all patients.

For this study, three current commercial denture adhesives with different contents were selected; and were divided into group A with (Fittydent) , group B (Protefix) and group C(Coreg denture adhesives). Each group had 24 complete dentures. Group D comprised of control (No adhesive).Each of three denture adhesives were applied to the MCD in the same manner according to the manufacturer instructions (4 strips of 1cm). After the insertion of MCD and 5 min waiting time, the patient was asked to chewing one hundred cycles and than dislodge forces were applied to MCD with a DD (PCE-FB 500, PCE Instruments UK Ltd, United Kingdom).A total of three measurements were performed on each group with one minute waiting time after each measurement and the average of them were taken.

Measuring of dislodge forces

The DD (PCE-FB 500, PCE Instruments UK Ltd, United Kingdom) was used to measure the dislodgement forces (resultant of tensile and compressive stresses) at the accuracy of 0.1 N [7]. The DD was attached to MCD by a steel wire which connect to middle palatal surface [8] via acrylic platform with 45°.After the measurement of each adhesive was completed, the dentures were cleaned according to the manufacturer instructions in order not to

disrupt the effectiveness of the adhesives. All procedures were made by the same investigator and the order of the application of the adhesives was randomized.

Exclusion criteria of study were as follows: (1) serious medical problems (Diabetes, etc.), (2) neurological disorders, (3) xerestomia, and (4) allergic sensitivity to any of adhesive materials

Table 1. The composition of the three denture adhesives

Adhesive	Contents
1.Fittydent	Sodium carboxymethyl-cellulose, polyvinylacetate, alcohol denat., petrolatum
2.Protefix	Sodium and calcium salts of the copolymer of methyl vinyl ether and maleic acid anhydride, carboxymethyl cellulose, paraffin, vaseline, silica, menthol, azorubin, p-hydroxy-benzoic acid methyl ester
3.Corega	Calcium/sodium PVM/MA copolymer, petrolatum, cellulose gum, praffinum liquidum, aroma

Results

It was found Group A had mean value of(8.21N) , group B (5.14N), group C (4.25 N) and group D had (3.81N).It was found that maximum retention strength was found with Fiftydent denture adhesive as compared to others. The results obtained in this study are shown in Table I and Table II

Table I Distribution of patients

Gender	Group A	Group B	Group C	Group D
Adhesive	Fiftydent	Protefix	Coreg	No adhesive
Number	24	24	24	24

Table I shows that group A used Fiftydent , group B used Protefix, group C used Coreg denture adhesive and group D was control. Each group had 24 complete dentures.

Table II : Comparison of values in all groups: Fittydent, Protefix, and Corega

Groups	Mean
Group A	8.21 N
Group B	5.14 N
Group C	4.25 N
Group D	3.81 N

Table II shows In our that Group A had mean value of(8.21N) , group B (5.14N), group C (4.25 N) and group D had (3.81N).It was found that maximum retention strength was found with Fiftydent .

Discussion

Retention and stability are the main features of the performance of complete denture [9].However it is difficult to provide optimal retention and stability that meets the patient’s expectations [10]. For this reason, overdentures, implants and mechanical devices like wires, springs, suction discs, suction chambers and magnets have been used for providing required retention [11,12].

Overdentures, implants and mechanical devices like wires, springs, suction discs, suction chambers and magnets are complicated options, denture adhesives are introduced as an adjunct to denture treatment [13] to improve function of the complete dentures, also comfort and confidence of the patient with providing psychological satisfaction [14,15].Adhesive strength of denture adhesives has been investigated in literature that most of them were in vitro studies [16,17]. However, the quantity and viscosity of saliva, the heights of the existing ridges, and different nature and texture of oral

mucosa play an important role on the retention of both dentures and adhesives [18,19].

The present study was comprised of 96 complete denture wearer patients. Three denture adhesives were divided into group A (Fittydent), group B (Protefix)and group C (Coreg denture adhesives). Each group had 24 complete dentures. In our study, It was found Group A had mean value of(8.21N) , group B (5.14N), group C (4.25 N) and group D had (3.81N).It was found that maximum retention strength was found with Fiftydent denture adhesive as compared to others

Kikuchi et al [20] in their study included 30 patients with complete mandibular dentures to evaluate the retention afforded by three commercial complete denture adhesives afforded by three commercial complete denture adhesives (Benfix, Fittydent and Supercorega). The purpose was to determine whether the use of complete denture adhesives is effective, and to establish which commercial brands offer the highest retention strengths. The results obtained indicate that retention is enhanced by the use of such adhesives, and that Fittydent offers the best retention performance, followed by Benfix and Supercorega.

According to Albaki, the highest adhesive strength value of Fittydent is about insoluble features that prevent material from being affected by saliva or liquids. Also, these features affect the bonding force with providing a strong adhesive and cohesive forces between CMC and the polyvinyl group. CMC provides a strong initial bond resulting a quick hold and polyvinyl group provides this process to continue longer. Besides that, hydrate material that is formed by CMC, is not disrupted and not washed away by salivary flow and makes the effect of the polymer lasts during use. As a result, Fittydent increases the retention of clinically poor and fair complete dentures [21]. Additionally, in vitro studies show the

similar results as Fittydent exhibited higher values [22,23].

Conclusion

Within the limitation of this study, the following conclusions can be drawn:

- (1) Use of denture adhesives improved the retention.
- (2) Fittydent was found to be the most effective denture adhesive.

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