ISSN : 2350-0743

www.ijramr.com

International Journal of Recent Advances in Multidisciplinary Research

Vol. 03, Issue 06, pp.1535-1537, June, 2016

RESEARCH ARTICLE

IMPORTANCE OF DENTURE ADHESIVE IN COMPLETE DENTURE PATIENTS- A REVIEW

[1]Dr. Revathy Gounder and [2,*]Priyangaa Sathasivam

[1]Senior Lecturer, MDS, Department of Prosthodontics and Implant Dentistry, Saveetha Dental College and Hospital, Chennai-77, India

[2]BDS Studentl Saveetha Dental College and Hospitals, Chennai-77, India

ARTICLE INFO

Article History:

Received 20th March, 2016
Received in revised form
18th April, 2016
Accepted 27th May, 2016
Published online 30th June, 2016

Keywords:

Complete Denture,
Denture Adhesive,
Retention,
Function,
Stability,
Oral Mucosa.

ABSTRACT

Patients with complete dentures require unique considerations due to their compromised oral anatomy, reduced adaptive capacity, and systemic conditions that further affect denture retention and stability. The use of denture adhesives is common among denture wearers and is also prescribed by many dentists. Denture adhesives add to the retention, stability and thereby improve chewing ability, reduce any instability, provide comfort and eliminate the accumulation of food debris beneath the dentures. Denture adhesive is a material used to adhere a denture to the oral mucosa. In the oral cavity, with the presence of water from saliva, the materials swell and create an adhesion between the denture and the gingiva that improves the retention and stability on denture wearing patients. They also increase the patient's sense of security and satisfaction.

INTRODUCTION

One of the main problems posed by complete dentures is retention, stability and function. In order to solve this, dentists have attempted to improve denture adhesion by developing a range of glues of highly varied composition and efficacy. The use of dental adhesive began in 18th century (McCabe *et al*., 2002). Denture adhesive is a material used to adhere a denture to the oral mucosa. Basically, dental adhesive provide a binding layer on the surface of removable complete dentures, thus allowing the latter to adhere to the supporting tissues of the edentulous patients (McCabe *et al*., 2002). Dental adhesive act as a cushion for denture bearing mucosa that may be thinned by age or susceptible to irritation from the lack of lubrication from poor quality or quantity of saliva. Denture adhesive also indicated when well-made complete dentures do not satisfy a patient's perceived retention and stability expectations.

Composition of Denture Adhesive

Adhesive materials can be categorized according to their solubility into soluble products like creams, pastes, and powders, and insoluble products like pads and wafers. The common components of denture adhesives are (Kumar *et al*., 2015)

- methyl vinyl ether- maleic anhydride copolymer which has high molecular weight copolymers with adhesive and cohesive properties,
- karaya gum which act as a thickener,
- tragacanth which is a water soluble mixture of polysaccharides that absorbs water to become a gel,
- acacia which is a preservative,
- pectin and gelatin-gelling agent,
- carboxymethylcellulose-a viscosity modifier/ thickener ,
- mineral oil which is suspending and levigating agent ,
- antimicrobial agents like ethanol, sodium borate, sodium tetra borate, hexachlorophene ,
- nontoxic addictive's ,
- flavoring agents like peppermint oil, wintergreen oil improves taste.

Ideal Requirements of Denture Adhesive

Denture adhesive should be formulated in such a way that it is not toxic to the systemic or oral health of the patient; it should be biocompatible and non- irritant. It should not promote any bacterial or fungal growth. Easy application and removal from the tissue surface of the denture. It should have a neutral odor, taste and consistency. It also should increase the comfort, retention and stability of the denture. It also should maintain adhesive for 8 to 12 hours and cost effective to the patients (Kumar *et al*., 2015; Adisman, 1989).

Corresponding author: Priyangaa Sathasivam,
BDS Studentl Saveetha Dental College and Hospitals, Chennai-77, India.

Mode of Action

As the adhesive powders absorb water, they tends to swell from 50 to 150% by volume and the formed anions interact with cations in the proteins in the oral mucous membrane. The viscosity of the adhesive is increased due to formation of viscous saliva thereby increasing the denture retention. Newer adhesive materials provide stronger bio-adhesive and cohesive forces. Free carboxyl groups formed by the hydration of adhesive such as methyl cellulose, hydroxyl methyl cellulose, sodium carboxyl methyl cellulose or poly methyl vinyl-ether maleic anhydrite, etc., form electro covalent bonds that produce stickiness or bio adhesion. Increased viscosity of the adhesive results in the lateral spread excluding air and saliva thereby increasing the retention (Kumar *et al*., 2015).

Importance of Denture Adhesive

Denture adhesive improves the retention and stability of dentures in edentulous patients, especially in cases where salivary flow is impaired or in the management of traumatized oral mucosa. Denture adhesive are indicated when well-made complete dentures do not satisfy a patients perceived retention and stability function. Denture adhesive also improve denture-related bite force (Grasso *et al*., 1994; de Baat *et al*., 2007; Psillakis *et al*., 2004; Ozcan *et al*., 2005; Gendreau *et al*., 2009; Cheng *et al*., 2010). Rendell *et al* evaluated the impact of denture adhesives on the chewing rates in complete dentures patients. The mean chewing rates increased immediately after applying the adhesive and continued to increase after two to four hours (Rendell *et al*., 2000). The use of denture adhesive will increase denture try in accuracy and decrease the patient apprehensionabout the fit of the final prosthesis. Denture adhesive may benefit the patients by reducing the amount of food particles collecting under the dentures (Figueiral *et al*., 2011). Recording jaw relations and denture try in should be done by using stable and retentive bases therefore denture adhesive stabilize the trial denture bases which show inadequate retention and stability. Denture adhesive can be used in compromised denture bearing areas which adds to their confidence thereby increasing the ability to adapt to the new prosthesis.

Denture adhesive can stabilize the dentures in patients with hormonal changes and neuromuscular disorders such as Parkinson's and Alzheimer's disease. Prosthesis to rehabilitate gross maxillofacial defects requires denture adhesive for retention. Denture adhesive are also a valuable adjuncts to the retention of radiation carriers. Minimal usage of adhesive usage can also provide high profile patients like executives, speakers and etc. with psychological security in social situations. Furthermore, adhesives also improve chewing efficacy and minimize the mucosal irritation and ulceration from ill-fitting prostheses (Garrett *et al*., 1996; Kupp and Sheridan, 2003). It also minimizes the impaired blood supply to the mucosa (Grasso *et al*., 1994; Fujimori *et al*., 2002; Olshan *et al*., 1992). Finally, adhesives can also benefit xerostomic patients and those with impaired muscular control (Bogucki, 2008). When considering complete denture treatment for xerostomic patient, good attention and care should be given to clinical and laboratory procedures aimed at optimizing denture retention and stability.

Dentures incorporating metal bases may exhibit improved accuracy of fit and effective wetting contributing to better retention (Lloyd, 1996; Hummel *et al*., 1999). In xerostomic patients denture adhesive are used to augment retention. In addition to improve retention and stability, a well hydrated denture adhesive can be used to provide cushioning and lubricating effect (Grasso *et al*., 1994).

Disadvantages and Contraindications

Many dentists hesitate to prescribe denture adhesive due to certain adverse effects. Dentist fears that denture adhesives can cause increased alveolar ridge resorption and soft tissue hypoplasia (Tarbet andGrossman, 1980; Pradies *et al*., 2009; Abdelmelak *et al*., 1978; Boone, 1984). Kapur in his studies suggested that significant loss of retention occurred because the denture adhesive material functions by swelling and gelling upon insertion to fill the space between the soft tissue and the denture base (Kapur, 1967). Neurological problems related denture adhesive toxicity can occur if zinc is not removed from denture adhesive as zinc is an antimicrobial agent used in denture adhesives (Nations *et al*., 2008; Hedera *et al*., 2009). Denture adhesive should be contraindicated in patients who are allergic to any components of dental adhesive. Adhesive should not be used to retain fractured dentures or dentures with lost flanges. Denture adhesive should not be used in patients with excessive bone resorption and soft tissue shrinkage leading to loss of vertical dimension. Patients with inability to maintain proper oral hygiene of the denture should avoid the use of denture adhesive.

Conclusion

With proper use, denture adhesives are beneficial to the patient in increasing retention and stability, enhanced comfort, improved function, and in providing psychologicalsatisfaction, thus improving the edentulous patient's quality of life (QoL). Care should be taken when prescribing and using denture adhesive containing zinc because of their adverse systemic effects. Without proper guidance and instructions from the dentist, patients should not use denture adhesives inadvertently. Dentist should diagnose dry mouth disorder in elderly patients, so that preventive and definitive treatment can be provided to achieve acceptable levels of comfort and function.

REFERENCES

Abdelmelak, R.G., Michael, C.G. 1978. Theeffect of denture adhesives on the palatal mucosa under complete dentures: a clinical and histological investigation. *Egypt Dent J.,* 24:419–430.

Adisman, I.K. 1989. The use of denture adhesives as an aid to denture treatment. *J Prosthet Dent.,* 62(6):711-5.

Bogucki, Z. 2008. Effects of dental adhesive materials on the retention of complete maxillary denture in patients with xerostomia in the in vivo study.ProtetStomatol 58:424–430

Boone, M. 1984. Analysis of soluble and insoluble denture adhesives and their relationship to tissue irritation and bone resorption. *CompendContEduc Dent.,* 4: 22–25.

Cheng, S., Zhao, K. 2010. Effect of denture adhesive on biting force of complete dentures. Abstract presented at: IADR Chinese Division; Zian, China.

de Baat, C., van't Hof M, van Zeghbroeck, L., Ozcan, M., Kalk, W. 2007. An international multicenter study on the effectiveness of a denture adhesive in maxillary dentures using disposable gnathometers. Clin Oral Investig 11(3):237-243.

Figueiral, M.H., Fonseca, P.A., Pereira-Leite, C., Scully, C.2011. The effect of different adhesive materials on retention of maxillary complete dentures. *Int J Prosthodont,* 24(2):175-7.

Fujimori, T., Hirano, S., Hayakawa, I. 2002. Effects of a denture adhesive on masticatory functions for complete denture wearers— consideration for the condition of denture-bearing tissues. J Med Dent Sci 49:151–156

Garrett, N., Perez, P., Elbert, C. and Kapur, K. 1996. Effects of improvements of poorly fitting dentures and new dentures on masticatory performance. *J Prosthet Dent.,* 75:269–275

Gendreau, L., Shanga, G., Munoz, C., Fernandez, P., Loewy, Z. 2009. A study of denture adhesive in well- f itting dentures. Abstract presented at: IADR General Session; Miami: April 2.

Grasso, J., Rendell, J., Gay, T. 1994. Effect of denture adhesive on the retention and stability of maxillary dentures. J Prosthet Dent 72:399–405

Grasso, J.E., Rendell, J., Gay, T. 1994. Effect of denture adhesive on the retention and stability of maxillary dentures. *J Prosthet Dent.,* 72(4):399405.

Grasso, J.E., Rendell, J., Gay, T. 1994. Effect of denture adhesive on the retention and stability of maxillary dentures. *J Prosthet Dent.,* 72:399-405.

Hedera, P., Peltier, A., Fink, J.K., Wilcock, S., London, Z. and Brewer, G.J. 2009. Myelopolyneuropathy and pancytopenia due to copper deficiency and high zinc levels of unknown origin II. The denture cream is a primary source of excessive zinc. *Neurotoxicology*, 30(6):996-999.

Hummel, S.K., Marker, V.A., Buschang, P. *et al*. 1999. A pilot study to evaluate different palate materials for maxillary complete dentures with xerostomic patients.*J Prosthodont*. 8:10-1

Kapur, K.K. 1967. A clinical evaluation of denture adhesives. *J Prosthet Dent.,* 18(6):550-558.

Kumar, P.R., Shajahan, P.A., Mathew Jyothis, Koruthu Anil, Aravind Prasad, Ahammed M.F. 2015. Denture Adhesives in Prosthodontics: An overview. *Journal of International Oral Health,* 7 (Suppl 1): 93-95.

Kupp, L. and Sheridan, P. 2003. Denture sore mouth. Dermatol Clin 21:115–122

Lloyd, P.M. 1996. Complete-denture therapy for the geriatric patient. Dent Clin North Am. 1996;40:239254.

McCabe, J.F., Carrick, T.E., Kamohara, H. 2002. Adhesive bond strength and compliance for denture soft lining materials. *Biomaterials,* 23:1347-52.

Nations, S.P., Boyer, P.J., Love, L.A., Burritt, M.F., Butz, J.A., Wolfe, G.I., Hynan, L.S., Reisch, J., Trivedi, J.R.2008. Denture cream: An unusual source of excess zinc, leading to hypocupremia and neurologic disease. *Neurology,* 71(9):639-643.

Olshan, A., Ross, N., Mankodi, S., Melita, S. 1992. A modified Kapur scale for evaluating denture retention and stability: methodology study. *Am J Dent.,* 5:88–90

Ozcan, M., Kulak, Y., de Baat, C., Arikan, A., Ucankale, M. 2005. The effect of a new denture adhesive on bite force until denture dislodgement. *J Prosthodont*,14(2):122-126.

Pradies, G., Sans, I. and Evans, O. *et al*. 2009. Clinical study comparing the efficacy of two denture adhesives in complete denture patients. *Int J Prosthodont,* 22: 361–367.

Psillakis, J.J., Wright, R.F., Grbic, J.T., Lamster, I.B. 2004. In practice evaluation of a denture adhesive using a gnathometer. *J Prosthodont.,* 13(4):244250.

Rendell, J.K., Gay, T., Grasso, J.E., Baker, R.A., Winston, J.L. 2000. The effect of denture adhesive on mandibular movement during chewing. *J Am Dent Assoc.,*131(7):981-986.

Tarbet, W.J. and Grossman, E. 1980. Observations of denture supporting tissue during six months of denture adhesive wearing. *J Am Dent Assoc.,* 101: 789791.

****