TEST Engineering & Management

November - December 2019
ISSN: 0193 – 4120 Page No. 6746 - 6753

PREVALENCE OF DENTURE STOMATITIS AND ITS PREDISPOSING CONDITIONS - A RETROSPECTIVE INSTITUTIONAL STUDY

Type of manuscript: Retrospective study
Running title: Denture stomatitis prevalence

Godlin Jeneta J,Saveetha Dental College and Hospital,s Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India Mail Id: 151501020.sdc@saveetha.com
Subhashree. R Lecturer,Dept of Prosthodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India Mail Id: subhashreer.sdc@saveetha.com
Nivedhitha M.S Professor, Dept of Conservative Dentistry & Endodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India
Mail Id: nivedhitha@saveetha.com

Corresponding author
Subhashree. RLecturer,Dept of Prosthodontics Saveetha Dental College and Hospitals Saveetha Institute of Medical and Technical Sciences Saveetha University, 162, PH Road,Chennai 600077,TamiNadu, India
Contact no:9790741570
Mail Id:subhashreer.sdc@saveetha.com

Article Info
Volume 81
Page Number: 6746 - 6753
Publication Issue:
November - December 2019

Article History
Article Received: *5 March 2019*
Revised: *18 May 2019*
Accepted: *24 September 2019*
Publication: *31 December 2019*

Abstract:
Denture stomatitis is an inflammatory condition affecting denture wearers. It can occur mostly due to Candida infection or mechanical irritation from denture or allergic reaction to any of the material used for fabricating denture. Denture stomatitis is considered a multifactorial disease as it can occur due to occlusal disharmony and ill-fitting dentures, blockage of mucous glands, candida albicans. Various treatment and preventive measures are based on etiology of denture stomatitis. The aim of this study was to investigate the prevalence of type of denture stomatitis and its association with age, gender and type of treatment given. A retrospective study was done from 1 June 2019 till 1 March 2020. Data was reviewed from the patient's records and analyzed the data of 86,000 patients between June 2019 and March 2020 that were documented in a private institution. Statistical analysis was performed to assess the association between denture stomatitis with age, gender and type of treatment given. Prevalence of Type I denture stomatitis was 35.19%, Type II denture stomatitis was 44.44%, Type III denture stomatitis was 20.37%. The association between age group and type of denture stomatitis showed that there was no significant relation between age and type of denture stomatitis. Association between type of denture stomatitis and gender was statistically significant ($p<0.05$). The association between the type of denture stomatitis and treatment given was not significant. Type II denture stomatitis is the most common type of denture stomatitis and occurs mostly between age groups 41 to 59 years with females having higher prevalence compared to males. Most common treatment suggested was denture correction. To reduce the risk of denture stomatitis, dentists should take a step to educate the patients how to use dentures and risk associated with not maintaining well and how to prevent it.

Published by: The Mattingley Publishing Co., Inc.

November - December 2019
ISSN: 0193 – 4120 Page No. 6746 - 6753

Keywords: Denture stomatitis, Candidiasis, Pin point hyperplasia, Diffuse erythema, Papillary hyperplasia

I. INTRODUCTION

Denture stomatitis is an inflammatory condition affecting denture wearers. It can occur mostly due to Candida infection or mechanical irritation from denture or allergic reaction to any of the material used for fabricating denture (1). In 1936 Cahn named this condition as 'denture sore mouth', but this term was changed in 1963 by Cawson to 'denture stomatitis' as there is no discomfort seen. There were various other names given by various authors like 'chronic denture palatitis', 'stomatitis venenata', 'chronic atrophic candidiasis', 'denture related candidiasis', 'stomatitis protetica', 'stomatopathy prothetica', etc. But the most widely accepted name was denture stomatitis as the main cause of its occurrence was denture (2).

There are many classification on denture stomatitis. Newton (1962) classified denture stomatitis on clinical basis into three types, Type I: Pinpoint hyperaemia, Type II: Diffuse erythema and Type III: Inflammatory papillary hyperplasia (3). Budtz-Jorgensen & Bertram (1970) classified denture stomatitis as Type 1: simple localized inflammation, Type 2: simple diffuse inflammation, and Type 3: granular inflammation (2).

Newton's Type I denture stomatitis mostly occurs due to trauma from denture. Denture Stomatitis has been found to be in association with medical conditions, smoking, old denture, denture maintenance , candidal infection and bacterial infection, oral hygiene status and wearing denture during night time (3)(4)(5). Aetiology for denture stomatitis involves local, systemic conditions and denture conditions (6). There are controversies about the cause of denture stomatitis whether it is because of trauma or infection (7), (8). Denture stomatitis is considered a multifactorial disease as it can occur due to occlusal disharmony and ill fitting dentures, blockage of mucous glands, candida albicans (7), (9,10). People of lower economic status usually prefer removable dentures as they cannot afford the treatment cost of fixed partial dentures and maintenance of the removable prosthesis is not proper which might lead to denture stomatitis (11,12).

Various treatment and preventive measures are based on etiology of denture stomatitis. If the cause is ill fitting denture, discontinuing denture wearing is considered as an important treatment of denture stomatitis (2)(13). Management of candida based denture stomatitis is complex due to its multifactorial etiology. Use of antifungal therapy (14), removal of dentures during night and efficient plaque control can be followed to treat or prevent denture stomatitis (15,16). Recent studies suggested that use of denture relining materials with antifungals antiseptic mouth rinses and microwave irradiation to be considered for treatment of candida associated denture stomatitis (17). Some studies showed that implant over dentures can be effective alternative treatment options to reduce the prevalence of denture stomatitis specially in mandible as dentures are stabilized with implants (18,19), (20), (21,22).

The aim of this study was to investigate the prevalence of type of denture stomatitis and its association with age, gender and type of treatment given.

Published by: The Mattingley Publishing Co., Inc.

November - December 2019
ISSN: 0193 – 4120 Page No. 6746 - 6753

II. MATERIALS AND METHODS:

A retrospective study was done in a university based setting in a private institution. The clinical portion of this retrospective study was conducted over a 9 month period i.e from 1 June 2019 to 1 March 2020 and included patients with denture stomatitis were included in this study. Sampling bias was minimized by including all available data.

Newton's classification was considered for denture stomatitis:
Type 1- pin point hyperplasia
Type 2- diffuse erythema
Type 3- papillary hyperplasia

The treatment advised were also grouped into 4 groups
Group 1- denture correction
Group 2- replacement of denture
Group 3- advised medication
Group 4- advised fixed dental prosthesis

Data was reviewed from the patients records and analysed the data of 86,000 patients between June 2019 and March 2020. The data collected was entered, tabulated and analysed for evaluating association between denture stomatitis with age, gender and type of treatment given. Statistical analysis was done using SPSS Statistics Software for windows, version 20.0. Chi-square test and Pearson correlation was done to determine that is there any statistical significant association between denture stomatitis with age, gender and type of treatment given.

III. RESULTS AND DISCUSSION:

Prevalence of Type I denture stomatitis was 35.19%, Type II denture stomatitis was 44.44%, Type III denture stomatitis was 20.37% (Figure 1). The association between age group and type of denture stomatitis showed that there was no significant relation between age and type of denture stomatitis with Type II being the most common type of denture stomatitis (Figure 2). Association between type of denture stomatitis and gender was statistically significant ($p<0.05$). Type III denture stomatitis being more common in male while type II denture stomatitis being more common in females (Figure 3). The association between the type of denture stomatitis and treatment given shows that for patients with Type I denture stomatitis 24.07% treatment done was denture correction, for 5.56% replacement of denture was considered, for 3.70% medicine were given and only for 1.85% fixed option was considered. For patients with Type II denture stomatitis 20.37% treatment done was denture correction, for 14.81% replacement of denture was considered and for 9.26% medicine were given. For patients with Type III denture stomatitis 12.96% treatment done was denture correction, for 5.56% replacement of denture was considered and for 1.85% medicine was given (Figure 4).

The etiology of denture stomatitis is both local and systemic (23). It includes many factors -like smoking, medical condition, bacterial and candidal infections, oral hygiene etc (24). The prevalence of denture stomatitis is seen to be 10-65% (2). This study shows that the prevalence of denture stomatitis is higher in females. Many other studies had shown the same result of women being more affected with denture stomatitis compared to males (23,25–29). There are many studies which showed higher prevalence of denture stomatitis in males because of smoking, etc (24,30). This study showed that Type II denture stomatitis - diffuse erythema is most prevalent followed by Type I denture stomatitis - pinpoint hyperemia followed by papillary hyperplasia. These results varied in a study done by Kossioni et al (3), which showed that Type I had highest prevalence followed by Type II followed by Type III denture stomatitis.

Published by: The Mattingley Publishing Co., Inc.

November - December 2019
ISSN: 0193 – 4120 Page No. 6746 - 6753

Our study showed that there is no significant association between age and type of denture stomatitis. But denture stomatitis was most prevalent in the age group of 41-59 years. These results were similar to various other studies (24,25,31),(32). These findings were contradicted by some studies which reported a higher prevalence in elderly people (33,34).

One study showed that partial denture wearers had a significantly higher prevalence of denture stomatitis than complete denture wearers. The association between the type of denture stomatitis and treatment given showed that for patients with Type I denture stomatitis 24.07% treatment done was denture correction, for 5.56% replacement of denture was considered, for 3.70% medicine were given and only for 1.85% fixed option was considered. For patients with Type II denture stomatitis 20.37% treatment done was denture correction, for 14.81% replacement of denture was considered and for 9.26% medicine were given. For patients with Type III denture stomatitis 12.96% treatment done was denture correction, for 5.56% replacement of denture was considered and for 1.85% medicine was given. According to Walker et al and Bergendal et al (35,36), drugs alone cannot treat denture stomatitis till the cause of it has been treated. According to Moore et al (37), cases where there is no systemic condition involved, removal of dental plaque alone can treat denture stomatitis. Elimination of the etiologic factor is one of the best treatments considered for denture stomatitis (2).

Limitation of our study is that it is done in an institutional setting, hence there are limited samples. As it is an institutional study there can be operator bias, protocol bias seen. The clinical scenarios for all the patients with denture stomatitis might be different and the treatment given might vary according to the operator.

FIGURES:

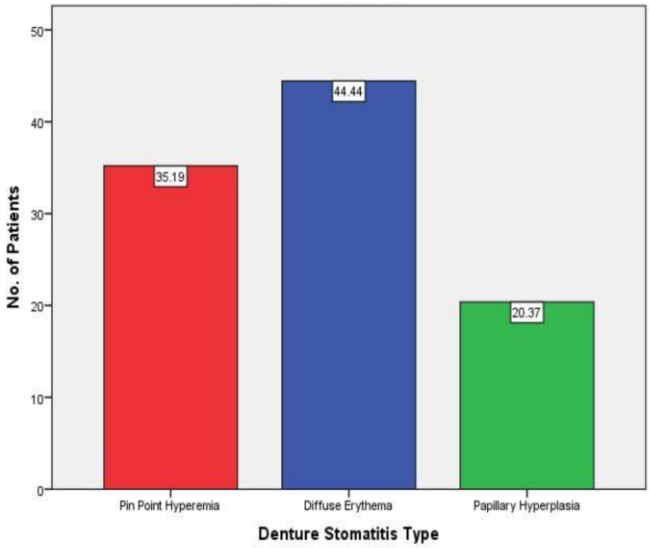

Figure 1: Bar graphs show the percentage of types of denture stomatitis. X axis - Denture stomatitis type, Y axis - no. of patients. 35.19% - Pinpoint Hyperemia (Red), 44.44% - Diffuse Erythema (Blue), 20.37% - Papillary Hyperplasia (Green). Diffuse Erythema was more prevalent than other types of denture stomatitis.

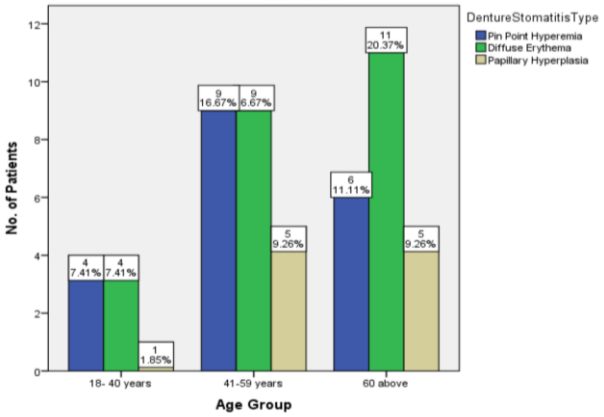

Figure 2 : Bar graphs show the association of age and types of denture stomatitis. X axis - Age group and Y axis - No of patients with denture stomatitis. Pinpoint erythema (Blue), Diffuse Erythema

Published by: The Mattingley Publishing Co., Inc.

November - December 2019
ISSN: 0193 – 4120 Page No. 6746 - 6753

(Green), Papillary Hyperplasia (Beige). Pearson association was done and found to be statistically not significant. Chi square : 1.471, df : 4, p value : 0.832 (> 0.5). However, diffuse erythema was common in the age group of above 60 than others.

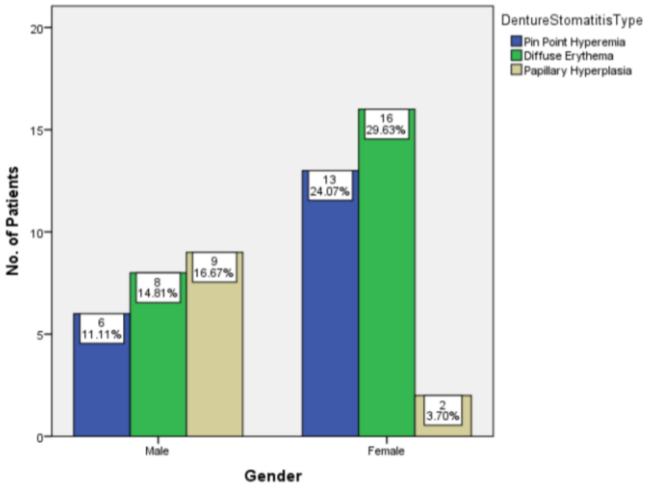

Figure 3: Bar graphs show the association of gender and types of denture stomatitis. X axis - Gender and Y axis - No of patients with denture stomatitis. Pinpoint erythema (Blue), Diffuse Erythema (Green), Papillary Hyperplasia (Beige). Pearson association was done and found to be statistically significant. Chi square : 8.706, df : 2, p value : 0.013 (< 0.5), hence proving that denture stomatitis is more common in females than in males.

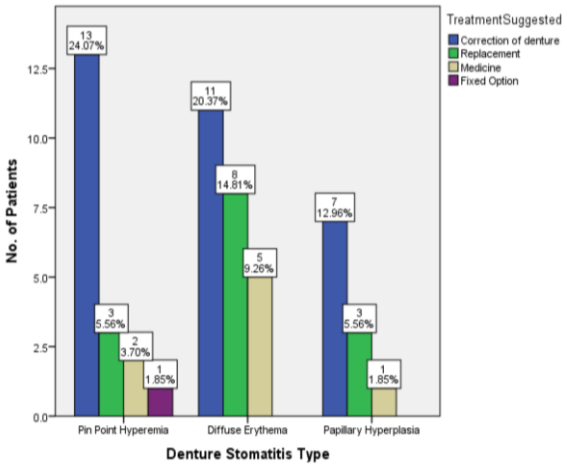

Figure 4: Bar graphs show the association of types of denture stomatitis and the treatment suggested.. X axis - Age group and Y axis - No of patients with denture stomatitis. Pinpoint erythema (Blue), Diffuse Erythema (Green), Papillary Hyperplasia (Beige). Pearson association was done and found to be statistically not significant. Chi square : 5.213, df : 6, p value : 0.517 (> 0.5). However, corrections of the denture were commonly suggested treatment than others.

IV. CONCLUSION:

Type II denture stomatitis is the most common type of denture stomatitis and occurs mostly between age groups 41 to 59 years with females having higher prevalence compared to males. Most common treatment suggested was denture correction. Association of type of denture stomatitis with age and treatment given was not significant. But association between type of denture stomatitis and gender was significant with females having the highest prevalence of Type II denture stomatitis. To reduce the risk of denture stomatitis, dentists should take a step to educate the patients how to use dentures and risk associated with not maintaining well and how to prevent it.

V. REFERENCES:

[1]. Budtz-Jörgensen E. Clinical aspects of Candida infection in denture wearers [Internet]. Vol. 96, The Journal of the American Dental Association. 1978. p. 474–9. Available from: http://dx.doi.org/10.14219/jada.archive.1978.0088

[2]. Arendorf TM, Walker DM. Denture stomatitis: a review [Internet]. Vol. 14, Journal of Oral Rehabilitation. 1987. p. 217–27. Available from: http://dx.doi.org/10.1111/j.1365-2842.1987.tb00713.x

[3]. Kossioni AE. The prevalence of denture

Published by: The Mattingley Publishing Co., Inc.

November - December 2019
ISSN: 0193 – 4120 Page No. 6746 - 6753

stomatitis and its predisposing conditions in an older Greek population [Internet]. Vol. 28, Gerodontology. 2011. p. 85–90. Available from: http://dx.doi.org/10.1111/j.1741-2358.2009.00359.x

[4]. Jyothi S, Robin PK, Ganapathy D, Anandiselvaraj. Periodontal Health Status of Three Different Groups Wearing Temporary Partial Denture [Internet]. Vol. 10, Research Journal of Pharmacy and Technology. 2017. p. 4339. Available from: http://dx.doi.org/10.5958/0974-360x.2017.00795.8

[5]. Jyothi S, Robin PK, Ganapathy D, Anandiselvaraj. Periodontal Health Status of Three Different Groups Wearing Temporary Partial Denture [Internet]. Vol. 10, Research Journal of Pharmacy and Technology. 2017. p. 4339. Available from: http://dx.doi.org/10.5958/0974-360x.2017.00795.8

[6]. Ganapathy D. Effect of Resin Bonded Luting Agents Influencing Marginal Discrepancy in All Ceramic Complete Veneer Crowns [Internet]. JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH. 2016. Available from: http://dx.doi.org/10.7860/jcdr/2016/21447.9028

[7]. Zakhari KN, McMurry WS. Denture stomatitis and methods influencing its cure [Internet]. Vol. 37, The Journal of Prosthetic Dentistry. 1977. p. 133–40. Available from: http://dx.doi.org/10.1016/0022-3913(77)90234-7

[8]. Duraisamy R, Krishnan CS, Ramasubramanian H, Sampathkumar J, Mariappan S, Sivaprakasam AN. Compatibility of Nonoriginal Abutments With Implants [Internet]. Vol. 28, Implant Dentistry. 2019. p. 289–95. Available from: http://dx.doi.org/10.1097/id.0000000000000885

[9]. Vijayalakshmi B, Ganapathy D. Medical management of cellulitis [Internet]. Vol. 9, Research Journal of Pharmacy and Technology. 2016. p. 2067. Available from: http://dx.doi.org/10.5958/0974-360x.2016.00422.4

[10]. Ganapathy DM, Kannan A, Venugopalan S. Effect of Coated Surfaces influencing Screw Loosening in Implants: A Systematic Review and Meta-analysis [Internet]. Vol. 8, World Journal of Dentistry. 2017. p. 496–502. Available from: http://dx.doi.org/10.5005/jp-journals-10015-1493

[11]. Subasree S, Murthykumar K, Dhanraj. Effect of Aloe Vera in Oral Health-A Review [Internet]. Vol. 9, Research Journal of Pharmacy and Technology. 2016. p. 609. Available from: http://dx.doi.org/10.5958/0974-360x.2016.00116.5

[12]. Jain A, Ranganathan H, Ganapathy D. Cervical and incisal marginal discrepancy in ceramic laminate veneering materials: A SEM analysis [Internet]. Vol. 8, Contemporary Clinical Dentistry. 2017. p. 272. Available from: http://dx.doi.org/10.4103/ccd.ccd_156_17

[13]. Jeganathan S, Lin CC. Denture stomatitis - a review of the aetiology, diagnosis and management [Internet]. Vol. 37, Australian Dental Journal. 1992. p. 107–14. Available from: http://dx.doi.org/10.1111/j.1834-7819.1992.tb03046.x

[14]. Webb BC, Thomas CJ, Willcox MDP, Harty DWS, Knox KW. Candida-associated denture stoma titis. Aetiology and management: A review. Part 2. Oral diseases caused by candida species [Internet]. Vol. 43, Australian Dental Journal. 1998. p. 160–6. Available from: http://dx.doi.org/10.1111/j.1834-7819.1998.tb00157.x

[15]. Ashok V, Suvitha S. Awareness of all ceramic restoration in rural population [Internet]. Vol. 9, Research Journal of Pharmacy and Technology. 2016. p. 1691. Available from: http://dx.doi.org/10.5958/0974-360x.2016.00340.1

[16]. Ashok V, Nallaswamy D, Benazir Begum S, Nesappan T. Lip Bumper Prosthesis for an Acromegaly Patient: A Clinical Report [Internet]. Vol. 14, The Journal of Indian Prosthodontic Society. 2014. p. 279–82. Available from: http://dx.doi.org/10.1007/s13191-013-0339-6

Published by: The Mattingley Publishing Co., Inc.

November - December 2019
ISSN: 0193 – 4120 Page No. 6746 - 6753

[17]. Pattanaik S, Vikas BVJ, Pattanaik B, Sahu S, Lodam S. Denture Stomatitis: A Literature Review [Internet]. Vol. 22, Journal of Indian Academy of Oral Medicine and Radiology. 2010. p. 136–40. Available from: http://dx.doi.org/10.5005/jp-journals-10011-1032

[18]. Basha FYS, Ganapathy D, Venugopalan S. Oral Hygiene Status among Pregnant Women [Internet]. Vol. 11, Research Journal of Pharmacy and Technology. 2018. p. 3099. Available from: http://dx.doi.org/10.5958/0974-360x.2018.00569.3

[19]. Ajay R, Suma K, Ali S, Sivakumar JK, Rakshagan V, Devaki V, et al. Effect of surface modifications on the retention of cement-retained implant crowns under fatigue loads: An In vitro study [Internet]. Vol. 9, Journal of Pharmacy And Bioallied Sciences. 2017. p. 154. Available from: http://dx.doi.org/10.4103/jpbs.jpbs_146_17

[20]. Emami E, de Grandmont P, Rompré PH, Barbeau J, Pan S, Feine JS. Favoring Trauma as an Etiological Factor in Denture Stomatitis [Internet]. Vol. 87, Journal of Dental Research. 2008. p. 440–4. Available from: http://dx.doi.org/10.1177/154405910808700505

[21]. Venugopalan S, Ariga P, Aggarwal P, Viswanath A. Magnetically retained silicone facial prosthesis [Internet]. Vol. 17, Nigerian Journal of Clinical Practice. 2014. p. 260. Available from: http://dx.doi.org/10.4103/1119-3077.127575

[22]. Kannan A, Venugopalan S. A systematic review on the effect of use of impregnated retraction cords on gingiva [Internet]. Vol. 11, Research Journal of Pharmacy and Technology. 2018. p. 2121. Available from: http://dx.doi.org/10.5958/0974-360x.2018.00393.1

[23]. Bastiaan RJ. Denture sore mouth. Aetiological aspects and treatment [Internet]. Vol. 21, Australian Dental Journal. 1976. p. 375–82. Available from: http://dx.doi.org/10.1111/j.1834-7819.1976.tb05091.x

[24]. Kossioni AE. The prevalence of denture stomatitis and its predisposing conditions in an older Greek population [Internet]. Vol. 28, Gerodontology. 2011. p. 85–90. Available from: http://dx.doi.org/10.1111/j.1741-2358.2009.00359.x

[25]. Shulman JD, Rivera-Hidalgo F, Beach MM. Risk factors associated with denture stomatitis in the United States [Internet]. Vol. 34, Journal of Oral Pathology and Medicine. 2005. p. 340–6. Available from: http://dx.doi.org/10.1111/j.1600-0714.2005.00287.x

[26]. Cankovic M, Bokor-Bratic M, Marinoski J, Stojanovic D. Prevalence and possible predictors of the occurence of denture stomatitis in patients older than 60 years [Internet]. Vol. 74, Vojnosanitetski pregled. 2017. p. 311–6. Available from: http://dx.doi.org/10.2298/vsp150104185c

[27]. Freitas JB, Gomez RS, de Abreu MHNG, Ferreira EFE. Relationship between the use of full dentures and mucosal alterations among elderly Brazilians [Internet]. Vol. 35, Journal of Oral Rehabilitation. 2008. p. 370–4. Available from: http://dx.doi.org/10.1111/j.1365-2842.2007.01782.x

[28]. Kulak-Ozkan Y, Kazazoglu E, Arikan A. Oral hygiene habits, denture cleanliness, presence of yeasts and stomatitis in elderly people [Internet]. Vol. 29, Journal of Oral Rehabilitation. 2002. p. 300–4. Available from: http://dx.doi.org/10.1046/j.1365-2842.2002.00816.x

[29]. Aoun G, Cassia A. Evaluation of Denture-related Factors Predisposing to Denture Stomatitis in a Lebanese Population [Internet]. Vol. 28, Materia Socio Medica. 2016. p. 392. Available from: http://dx.doi.org/10.5455/msm.2016.28.392-396

[30]. MacEntee MI, Glick N, Stolar E. Age, gender, dentures and oral mucosal disorders [Internet]. Vol. 4, Oral Diseases. 2008. p. 32–6. Available from: http://dx.doi.org/10.1111/j.1601-0825.1998.tb00252.x

[31]. Jeganathan S, Payne JA, Thean HPY. Denture stomatitis in an elderly edentulous Asian population [Internet]. Vol. 24, Journal of Oral

Published by: The Mattingley Publishing Co., Inc.

November - December 2019
ISSN: 0193 – 4120 Page No. 6746 - 6753

Rehabilitation. 2008. p. 468–72. Available from: http://dx.doi.org/10.1111/j.1365-2842.1997.tb00359.x

[32]. Martins KV, de Lacerda Gontijo SM. Treatment of denture stomatitis: literature review [Internet]. Vol. 74, Revistas. 2017. p. 215. Available from: http://dx.doi.org/10.18363/rbo.v74n3.p.215

[33]. Gendreau L, Loewy ZG. Epidemiology and Etiology of Denture Stomatitis [Internet]. Vol. 20, Journal of Prosthodontics. 2011. p. 251–60. Available from: http://dx.doi.org/10.1111/j.1532-849x.2011.00698.x

[34]. Jainkittivong A, Aneksuk V, Langlais RP. Oral mucosal conditions in elderly dental patients [Internet]. Vol. 8, Oral Diseases. 2002. p. 218–23. Available from: http://dx.doi.org/10.1034/j.1601-0825.2002.01789.x

[35]. Walker DM, Stafford GD, Huggett R, Newcombe RG. The treatment of denture-induced stomatitis. Evaluation of two agents [Internet]. Vol. 151, British Dental Journal. 1981. p. 416–9. Available from: http://dx.doi.org/10.1038/sj.bdj.4804725

[36]. Bergendal T. Status and treatment of denture stomatitis patients: a 1-year follow-up study. Scand J Dent Res. 1982 Jun;90(3):227–38.

[37]. Moore TC, Smith DE, Kenny GE. Sanitization of dentures by several denture hygiene methods. J Prosthet Dent. 1984 Aug;52(2):158–63.

Published by: The Mattingley Publishing Co., Inc.