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Prevalence and Incidence of Desquamative Gingivitis among Patients Visiting a Private Teaching Hospital in Chennai, India

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Abstract

Desquamative gingivitis (DG) is a term indicating epithelial desquamation, erythema, erosion and/or vesiculobullous lesion of the attached and marginal gingiva. The lesions of DG mainly involve the buccal aspect of the gingiva. The term desquamative gingivitis is not a specific diagnosis , but describe several mucocutaneous disorders major of which are oral lichen planus (OLP), mucous membrane pemphigoid (MMP), pemphigus vulgaris (PV). The aim of the study was to assess the prevalence and incidence of desquamative gingivitis among the patients visiting the outpatient department of periodontics at a private teaching hospital , Chennai, India. This is a descriptive study which was performed under a university setting in which the data of patients who were diagnosed with desquamative gingivitis in the department of Periodontics at a private teaching hospital, Chennai from June 2019 to March 2020 was collected by reviewing patients records and the analysis of data of 86000 patients was done. The collected data was compiled , reviewed, tabulated and imported to SPSS software (version 22.0) for statistical analysis. The prevalence of desquamative gingivitis was found to be less 0.1% and had a female predilection (67%) and patients between 50 to 60 years of age were more commonly affected by DG. Most cases of DG presented with burning sensation in the mandibular gingiva (50%) . The most common treatment of DG was found to be pharmacotherapy mainly corticosteroids (50%) . Thus the knowledge of prevalence of desquamative gingivitis and correlation with various parameters is essential in dental practice for clinical implementation.

Keywords: *Desquamative gingivitis; systemic conditions; erythema ;corticosteroids*

Introduction

The current classification system for periodontal diseases and conditions includes, ‘‘gingival manifestations of systemic conditions’’ among the non plaque–induced gingival disorders [1,2].

Desquamative gingivitis (DG) is a term indicating epithelial desquamation, erythema, erosion, and/or vesiculobullous lesions of the attached and the marginal gingiva[3]. The Lesions mainly involve the buccal aspect of the gingiva of the anterior teeth in a diffusive pattern , but can also occur at any site in the gingiva with variable extent [4,5]. The term ‘‘desquamative gingivitis’’ is not a specific diagnosis, but describes several mucocutaneous disorders and systemic conditions [6]. It has been reported that there is an association of DG with oral lichen planus (OLP) , oral lichenoid lesions (OLL), pemphigus vulgaris (PV), mucous membrane pemphigoid (MMP), paraneoplastic pemphigus (PNP), erythema multiforme (EM), graft versus host disease (GVHD), lupus erythematosus (LE), epidermolysis bullosa acquisita

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(EBA), linear immunoglobulin A (IgA) disease (LAD), foreign body gingivitis, plasma cell gingivitis, chronic ulcerative stomatitis, dermatitis herpetiformis, and psoriasis[7] . Besides their heterogeneous nature, all of these disorders share two features in common : an immune mediated pathogenesis and possibly a common clinical appearance, that is the so-called ‘‘desquamative gingivitis’’. DG is very often associated with mucous membrane pemphigoid (MMP)[8–10] , followed by oral lichen planus (OLP)[11,12] and PV[13–15]. Overall, MMP, OLP, and PV are the most common causes of DG, with the first two accounting for 80% of the cases [16–18].

DG may represent an early sign of these disorders, which is important for the early detection and management, as many of these diseases are systemic in nature and are associated with a high morbidity and poor prognosis[19] . However , there is no evidence that DG per se can cause loss of attachment and alveolar bone destruction [20–22]. DG can present as a wide range of oral and gingival symptoms that can significantly compromise a patient’s oral hygiene and represents a potential risk factor for long-term periodontal health . The gingival features vary from erythema to erosive and/ or ulcerated areas. Intact vesicles or bullae can also occur but usually rupture quickly in the mouth [23,24]. When lesions of DG are recognized, the first step is to record a proper medical history. The onset and progression of the gingival lesions should be investigated carefully because most disorders associated with DG have a subacute onset, and the patient is generally unaware of it especially in cases of OLP and MMP while patients with PV will have a period in which symptoms and lesions arise [14,25].

Careful clinical examination of the oral mucosa is extremely important in assessing DG-associated disorders [26–29]. It is important to look for oral lesions with a specific appearance that will help in clinical diagnosis of different DG associated disorders[30] particularly for OLP lesions as they may generally involve multiple oral sites and show characteristic features [31–33]. Each DG associated disorder is characterized by different oral and systemic implications [34–36]. The treatment for DG is aimed at controlling the lesions and their symptoms thus preventing disease progression [37–39]. Supportive care is always important and includes hydration [40,41], nutritional support and elimination of precipitating factors [6,42–44] .

The purpose of the study was to associate age and gender of the patients who have desquamative gingivitis with chief complaint, symptoms, site affected, habits of the patient, past medical history , drug history, clinical appearance of different parts of the oral cavity which will aid the clinician to be prudent for overall evaluation of the patient and then execute treatment planning.

Materials and Method

This was a descriptive study which was performed in a university setting where the required data of patients who were diagnosed with desquamative gingivitis in the department of Periodontics at a private teaching hospital, Chennai from June 2019 to March 2020, was collected by reviewing patients records and the analysis of data of 86000 patients. The collected data was cross verified using photographs, reviewed by a reviewing expert and tabulated in Microsoft excel . The Sample size of the total number of patients diagnosed with gingivitis was n = 34859 of which patients diagnosed with desquamative gingivitis was hound to be n= 6 . The ethical approval of the current study was obtained from the institutional ethical board (Ethical approval number : SDC/SIHEC/2020/DIASDATA/0619-0320) . The tabulated data was imported to SPSS software (statistical package for social studies) version 22.0 (IBM corporation) for statistical analysis . To minimize sampling bias, collection of data was done by simple random sampling methods within the university. There is high internal validity and low external validity . The study included patients with healthy gingiva, gingivitis and lesions associated with desquamative gingivitis. Incomplete , censored and repeated data were excluded from the study.

Results and Discussion

The current study shows that gingivitis (71%) is the most common finding and prevalence of desquamative gingivitis (DG) is less than 0.1% [Figure 1] . There is female predilection (67%) indicating that females are most commonly affected with DG [Figure 2] . Figure 3 shows that patients of 50 to 60 years of age are commonly affected with DG. The most common chief complaint associated with patients with DG is the burning sensation of the gingiva (50%) followed by pain (33%) and bleeding (17%) . In most of the patients the mandibular gingiva was the common site to be affected (50%) while

33% of the patients presented with lesion in both maxilla and mandible. The maxilla was the least common site to be affected (17%) . The duration of symptoms associated with DG ranged from several days to years. Most patients showed symptoms for a duration of 1 year (50%) while few had duration of about 1 to 3 months (33%) and 1 to 10 days (17%) . All the patients had lip biting and mouth breathing habits. 33% of the patients had past medical history and drug treatment history for diabetes and hypertension . Most patients showed clinically healthy alveolar mucosa (50%) while an equal number of patients showed red and white lesions (17%) . 17% of the patients showed clinically healthy gingiva while 83% of the patients showed red , inflamed and soft gingiva with the absence of stippling . 50% of the patients showed clinically healthy mucosa , while the mucosa of 50% of the patients showed frictional keratosis , white striations with red pigmentation or erythematous area . The clinical examination of the tongue , floor of mouth, palate and other sites were normal. The most common treatment for DG is pharmacotherapy (50%) followed by scaling and curettage (33%) and proper diet intake (17%) . Corticosteroids was the treatment of choice for 50% of the patients . 33% of the patients required no treatment while 17% of the patients were advised to take proper diet [Figure 4]. Figure 5 shows the association of age, gender and chief complaint of the patients with desquamative gingivitis. Burning sensation of the gingiva was more common among males (66.6%) than in females (33.3%) and bleeding and pain of gingiva were only experienced by females (100%) and not males [Figure 5].

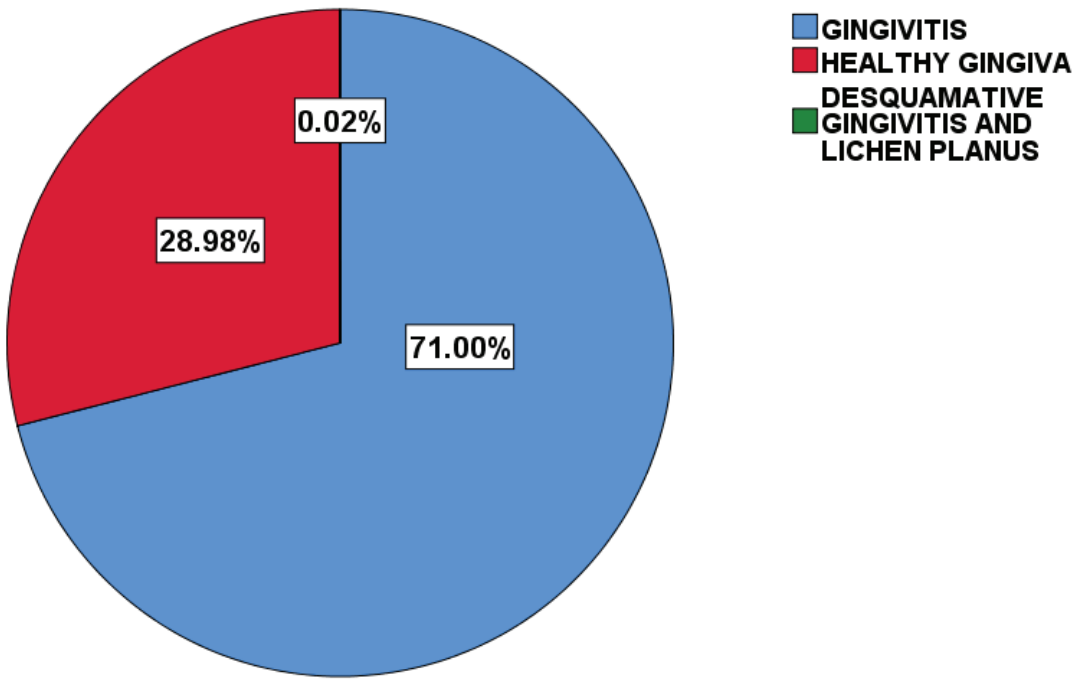

Figure 1 : The pie chart depicts the prevalence of desquamative gingivitis among patients visiting the out patient department of periodontics at a private teaching hospital in chennai. Blue denotes gingivitis , red denotes healthy gingiva and green denotes desquamative gingivitis and lichen planus. The prevalence of desquamative gingivitis is found to be less than 0.1%.

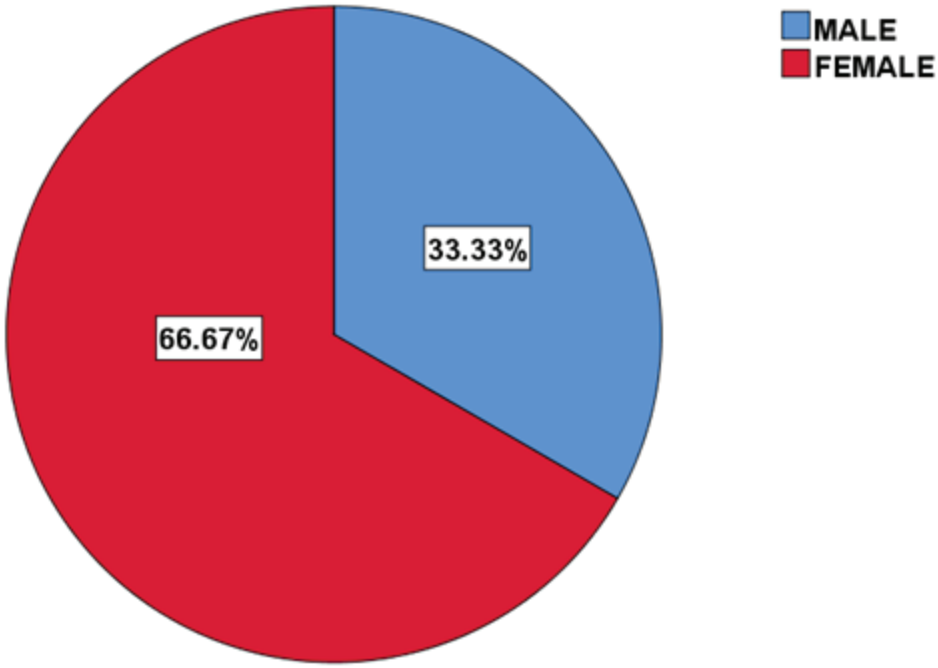

Figure 2 : The pie chart depicts the prevalence of desquamative gingivitis between different gender of patients visiting the out patient department of periodontics at a private teaching hospital in chennai. Blue denotes males and red denotes females. There is a high prevalence of desquamative gingivitis among the females . However, this is not statistically significant (Chi square test; p =0.414 ; p>0.005; Hence not significant)

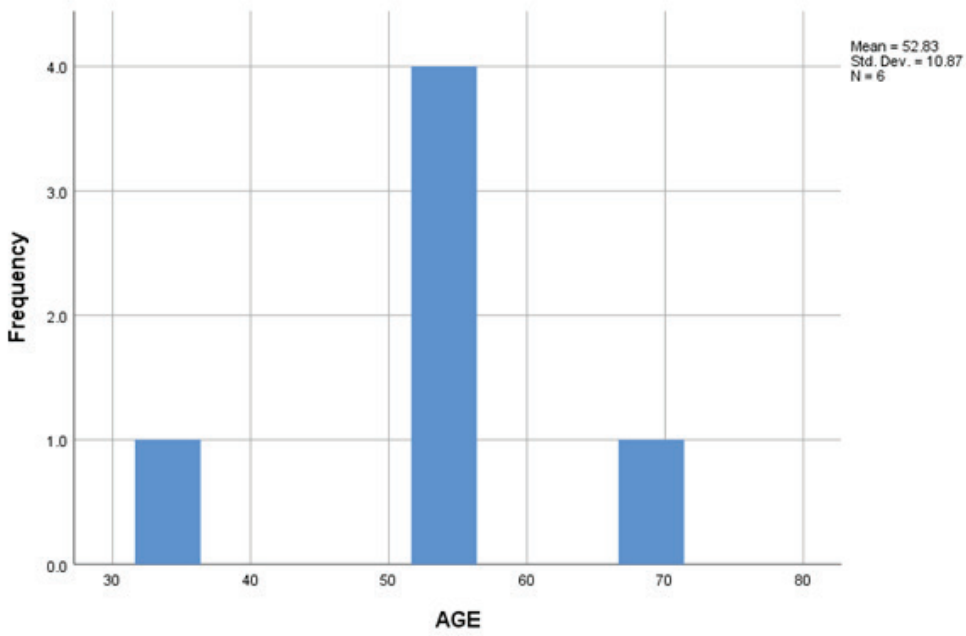

Figure 3 : The bar graph depicts the prevalence of desquamative gingivitis among different age groups of patients visiting the out patient department of periodontics at a private teaching hospital in chennai. The frequency of the number of patients is plotted on the Y axis on a scale of 0 to 4 and the age of the patients is plotted along the X axis on a scale of 30 to 80. Desquamative gingivitis was found to be more prevalent among individuals of age between 50 to 60 years. However, this is not statistically significant (Chi square test ; p =0.955 ; p>0.005; Hence not significant)

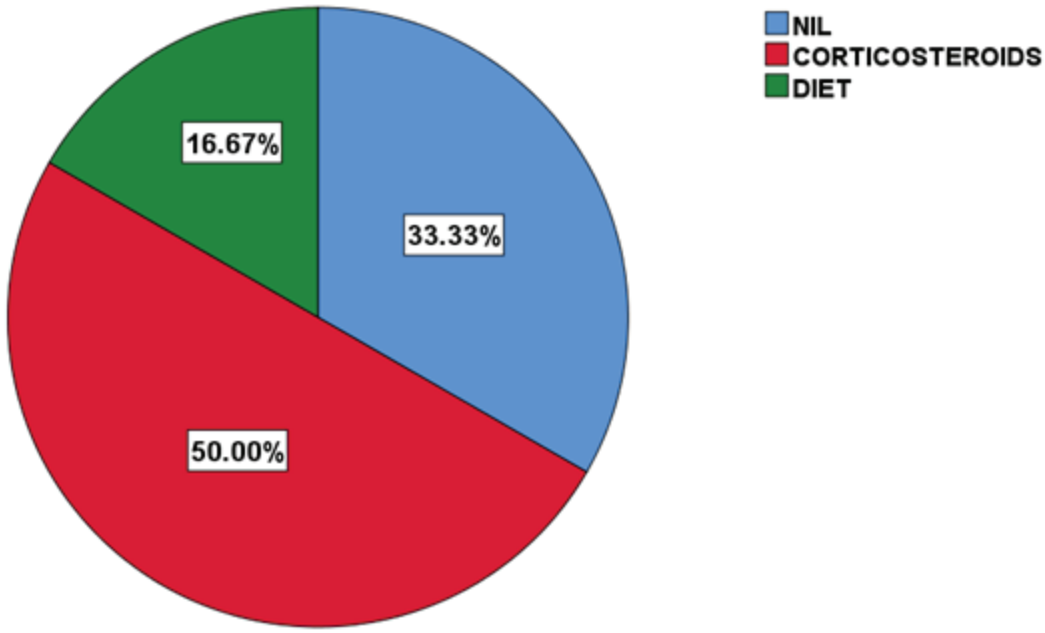

Figure 4 :The pie chart depicts the pharmacotherapy for treating desquamative gingivitis at a private teaching hospital in chennai. Blue denotes no medication, red denotes corticosteroids and green denotes diet. Corticosteroids was found to be the treatment of choice for desquamative gingivitis .

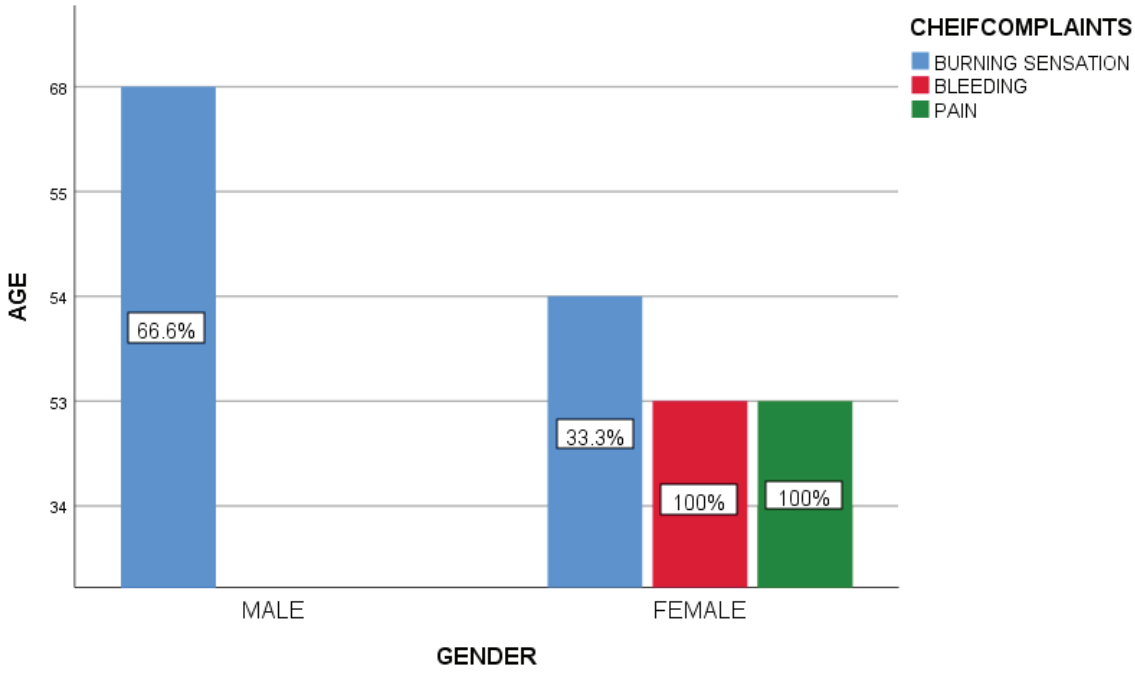

Figure 5: The bar graph depicts the percentage association of age , gender and chief complaints of the patients with desquamative gingivitis. The gender of the patient was plotted along the X axis and age of the patients was plotted along the Y axis. Blue denotes burning sensation of the gingiva, red denotes bleeding of the gingiva and green denotes pain. It is evident that burning sensation of the gingiva was more common among the males than in females and bleeding and pain of gingiva were only experienced by females and not males. Pearson's chi square value p=0.199; statistically not significant (p>0.05).

	GENDER	AGE	CHIEF COMPLAINTS	SITE	DURATION
Chi-Square	.667a	.667b	1.000c	1.000c	1.000c
df	1	4	2	2	2
Asymp. Sig.	.414	.955	.607	.607	.607
a. 2 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 3.0.					
b. 5 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 1.2.					
c. 3 cells (100.0%) have expected frequencies less than 5. The minimum expected cell frequency is 2.0.					

Table 1 :The table shows the chi square test for gender , age , chief complaint of patients with desquamative gingivitis , site affected and duration of desquamative gingivitis at private College Hospital in Chennai. It is evident that they are statistically not significant (p>0.005).

Desquamative gingivitis is a clinical finding with several etiologies. Among the etiology, the most common etiologies are oral lichen planus, cicatricial pemphigoid, and pemphigus vulgaris, although various other differential diagnoses exist. The presence of desquamative gingivitis often results in poor oral hygiene whose consequences include periodontitis and tooth loss. Though certain mucosal findings may directly suggest the presence of a particular diagnosis, a thorough history, physical examination, and appropriate dermato pathological and immunopathologic assessment is necessary for narrowing this broad differential diagnosis.

In our current study shows desquamative gingivitis was less than 0.1 % [Figure 1] . This is in concordance the study conducted by La Russo L et al., who stated that only 125 patients reported with clinical features of DG from the year 2004 to 2007 [7]**.** The decreased prevalence of lesions associated with desquamative gingivitis may be due to the improvement in the tools and techniques for immunologic analysis. Advancements in the knowledge and clinical practice, with a better understanding of the pathogenesis of the disorders associated with desquamative gingivitis and improved immunologic evaluation may have contributed to a decrease in the number of cases of desquamative gingivitis [45].

Our study showed female predilection which indicates that desquamative gingivitis was more common in females (67%) than in males (33.3%) [Figure 2]. The chi square test values of the prevalence of desquamative gingivitis among different genders was found to be statistically not significant (p>0.005) [Table 1]. This is in agreement with the studies conducted by Carbone M et al., and Skalvounou A et al.,[46,47] **.** Studies show that prevalence of disimmune disorders were more common in females[47]. The increased prevalence of desquamative gingivitis among females may be attributed to the hormones such as oestrogen and progesterone which changes in its levels during puberty, pregnancy, menstruation and menopause in females[48]. Other reasons may be due to intake or oral contraceptives, genetics and stress. Literature states that stress causes the decrease in saliva secretion thereby aids in the formation of dental plaque[49].

Desquamative gingivitis was found to be more common in patients of 50 to 60 years of age . The chi square test value of the prevalence of desquamative gingivitis among different age groups was statistically not significant (p>0.005) [Table 1]. This is in accordance with the study conducted by Sklavounou A et al., who stated that desquamative gingivitis is more common in

middle age and elderly females [47]**.** Carbone M et al., and seen in ages between 60-80 years[46]**.** Age is an important factor not only for diagnosis but also for formulating the treatment. It is also a differential parameter, considering the fact that some diseases have their onset in a specific age group. The conditions associated with DG usually have a peak of incidence between the fourth and sixth decade of life. Reports show that cases of children and adolescents are very uncommon [50–52]. The incidence of desquamative gingivitis in elderly people may be attributed to the poor diet intake, changes in salivary gland and salivary secretion and changes in the oral mucosal membrane.

The most common chief complaints of patients with DG in our data analysis was found to be the burning sensation of gingiva (50%) followed by pain (33.3%) and bleeding of the gums (16.7%) being the least common .The chi square test value for the chief complaint of patients diagnosed with desquamative gingivitis were statistically not significant (p>0.005) [Table 1]. Burning sensation was more commonly seen among the male patients (66.6%) while bleeding and pain was experienced by only female patients and not male patients .Dommy Aet al.,in his study reported that the most common chief complaint was burning sensation which is aggravated on consumption of spicy food[53] .Non plaque induced gingival erythema, gingival desquamation and intra oral lesions are major diagnostic criteria for DG which may be the cause of the burning sensation, pain and bleeding associated with DG. According to the study conducted by Leao J.C et al., Gingival soreness was the chief complaint of 92% of the patients while few patients complained of ulceration of oral mucosa (5%) [54]**.**

Our study shows that the lesions associated with DG were most commonly found in mandibular gingiva (50%) and least common in maxillary gingiva (16.7%) . 33% of the lesions involved both maxilla and mandible .The chi square test value for the site of occurence of desquamative gingivitis was statistically not significant (p>0.005) [Table 1]. Literature cited immune mediated disorders , most commonly affecting the buccal mucosa, tongue, gingiva, and labial mucosa of the mandible while the involvement of the palate, floor of the mouth, and upper lip are uncommon [55]. The study conducted by Carbone M et al., shows contradictory results stating that the maxilla is more commonly affected[46]. Ziskin D.E et al., and Dommy A et al., stated that the lesions may be present throughout the entire gingiva in the form vesicles or bullae [53,56]. The contradictory results may be due to the smaller sample size and difference in geographic area and ethnicity in our study.

The duration of symptoms of desquamative gingivitis was 1 to 10 days in most of the patients (50%) in our study. The chi square test value of the duration of symptoms of desquamative was statistically not significant (p>0.005) [Table 1]. The duration varied between studies conducted by different authors [53,54]. This may be due to the smaller sample size , usage of medication by the patient ,presence of systemic diseases and the difference in the duration of symptoms of various lesions associated with desquamative gingivitis.

All the patients reported with DG were found to have the habit of lip biting and mouth breathing and 67% of the patient presented with past medical history and drug history associated with diabetes and hypertension . Mouth breathing causes constant drying of the oral cavity, increased viscosity of saliva and loss of cleansing action which results in plaque deposits causing gingival inflammation which can lead to the manifestation of the underlying systemic mucocutaneous disorders . Studies have to be done to see for any direct correlation of these habits and Underlying pathology which results in the manifestation of the systemic condition on the gingiva. The first diagnostic step in identification of lesions associated with DG consists of taking careful medical history. The need for a detailed history is to help in the correct diagnosis of lesions associated with desquamative gingivitis as the diagnosis may be difficult and complicated. Determining etiologic factors that cause the lesions and arriving at the diagnosis of the underlying systemic disease can take a long time. The onset and progression of gingival lesions should be carefully investigated as most disorders associated with DG have a subacute onset, and the patient is generally unaware of it (especially OLP and MMP) [57–59]. The drug history of the patient plays an important role as local hypersensitive reactions may be caused due to several drugs , mouthwashes and even tooth pastes, which may play a causative role in few patients. Drugs such as aspirin, alpha blockers, chemotherapy medications, phenytoin and sulpha drugs cause mouth sores which

may exacerbate the lesions. Medications which can induce antimetabolic injury of oral mucosal epithelium include chemotherapeutic agents and few medications are found to cause stomatitis and oral ulcers.

Proper intraoral examination is required for the correct identification of various lesions associated with desquamative gingivitis[60]. The study showed that 66% of the patients were found to have clinically healthy alveolar mucosa while an equal number of patients were found to have red and white lesions .The alveolar mucosa is a thin, non keratinized mucosal layer covering the alveolar process of the maxilla and the mandible and is loosely attached to underlying bone and is continuous with the mucosa of the cheek, lips, tongue, and palate. Most red lesions of the oral cavity may be inflammatory in nature while some may be caused due to trauma, nutritional deficiencies and genetics. Red and white lesions are caused due to the necrosis of the oral epithelium. Ziskin D.E et al., and Dommy A et al., stated the presence of large vesicles and multiple bullae [53,56].

In the current study, 83% of the patients presented with red, inflamed and soft gingiva with absence of stippling which is a common indication of periodontal disease. Leao J et al., and Robinson N.A et al., reported that most patients presented with gingival erythema and areas of gingival desquamation [54,61]. Lo Russo L et al., reported 1 case of DG with no oral symptoms [7,62]. Most of these conditions associated with DG presents with a similar clinical appearance of the gingiva and can be only distinguished from each other by histologic presentation. This appearance of the gingiva in desquamative gingivitis may be due to the release of proinflammatory cytokines such as the tumour necrosis factor alfa, interleukin-1 and recruitment of inflammatory cells which causes the inflammation of the gingiva . These cytokines may also upregulate matrix metalloproteinases, which break down collagen and lead to the loss of periodontal attachment and bone destruction[63]. Reduced oral hygiene caused by gingival discomfort and bleeding on flossing which leads to dental plaque accumulation aggravates the clinical severity of inflammation[64].

The clinical presentation of desquamative gingivitis involves the gingival alteration which is not associated with biofilm formation and is framed within the gingival manifestations of systemic conditions. According to the clinical affectation, desquamative gingivitis can be distinguished into two types; one which are Mild forms, that are acute in nature and are characterized by the presence of erythema and mild desquamation without ulceration. On the other hand severe forms have erythema, desquamation, and painful ulcerations that affect the free and adhered gingiva[65] . The clinical characteristics of the disease varies according to the type and severity of the lesions.

Equal number of patients presented with normal and abnormal mucosa . Abnormal mucosal lesions may present as erythematous plaques in different areas of the oral mucosa. They may be due to infectious agents, metabolic disorders, endocrinopathies, neoplasms, developmental abnormalities, genetics, immunological disturbances and even injuries. Dommy A et al., and Maderal et al., in their study, stated that the mucosa is usually presented with erythema which is most frequently presented in sites such as the buccal mucosa [53,66]. Abnormal mucosal lesions may mostly occur due to lesions associated with erythema multiforme [67,68]. Lesions begin as areas of erythema with edema and progresses to erythematous plaques and bullous and erosive lesions with pseudomembrane formation.

Pharmacotherapy was the common treatment in most of the patients (50%) followed by scaling and root planing (33.3%) . This is in accordance with the study conducted by Nisengard R.J et al., who stated that pharmacotherapy is the most common and effective treatment followed by scaling and root planing and atraumatic oral hygiene [69–71]. The reason for the use of pharmacotherapy is that the systemic and topical pharmacological management of the underlying condition may contribute to improve the oral hygiene thereby reducing the overall inflammation. Other oral hygiene procedures must be atraumatic, as any mechanical and traumatic procedures may induce the exacerbation of lesions [11,72].

The use of corticosteroids was the most common medication (50%) while 16.7% of the patients were prescribed a proper diet [Figure 4]. Nisengard R.J et al., had stated that corticosteroids is the treatment of choice for desquamative gingivitis [69,73,74] .Topical corticosteroids such as hydrocortisone hemisuccinate and triamcinolone acetonide are the mainstay of therapy desquamative gingivitis and lesions associated with

it as these gingival lesions are often recalcitrant to therapy. The reason for the use of corticosteroids is that they are involved in a wide range of physiologic processes including stress response, immune response and regulation of inflammation . Topical corticosteroids must be considered a treatment of choice unless the disease is very extensive. Systemic therapy is considered for those with severe refractory disease [75].

Overall, desquamative gingivitis is a rare condition affecting majorly the female population in their fifth and sixth decade of life due to several reasons such as lack of nutrition, systemic illness and ill fitting dentures . Most patients complain of the burning sensation of the gingiva and pain which may be due to the desquamative nature of the lesions. The lesions were more commonly present in the mandibular gingiva and presented with symptoms from 1 to 10 days. The duration of symptoms may largely depend on the sample size of population , the past medical history of the patients and intake of medications by them. Lip biting and mouth breathing habits were associated with all the patients with DG and are found to cause the dryness of the mouth, decreased viscosity of saliva and loss of self cleansing ability. The intra oral examination revealed that the majority of the patients showed clinically healthy alveolar mucosa while an equal number of patients presented with red and white lesions which may be due to the atrophy of the oral mucous membrane . Majority of the patients showed red, inflamed and soft gingiva with the stippling indicating the presence of disease. Pharmacotherapy was the most common treatment in most of the patients as it helps in the management of the underlying disease, followed by scaling and root planing. The use of corticosteroids was the most common and effective medication used for DG as they are involved in a wide range of physiologic processes including stress response, immune response and regulation of inflammation .

The study was geographically limited and predominantly consisted of the South Indian population. Data which were unclear were excluded thereby reducing the sample size. Within the limit of the study , it was found that desquamative gingivitis presented in less than 0.1% of the patients, majorly affecting females of age 50 to 60 years . To ascertain the results of this study and to increase the level of significance, the sample size and the geographic area of coverage should be extended to at least most parts of South India. Conducting a multicentered study with extended geographic area and wide range of population in future we can obtain better results. Establishing the proper diagnosis is an absolute prerequisite for the effective treatment of the underlying disease in DG patients. Thus this knowledge of prevalence of DG and correlation with various parameters is essential in a dental practice for clinical implementation.

CONCLUSION

Desquamative gingivitis may be the clinical manifestation of a mucocutaneous disease process that recapitulates its pathogenesis in the mucosa of the oral cavity. Recognition of DG as a clinical sign of a mucocutaneous disease provides the alert clinician with a valuable diagnostic asset Thus the regular and thorough examination of the oral cavity in such patients is of paramount importance. Finally, establishing the proper diagnosis is an absolute prerequisite for effective treatment of the underlying disease in DG patients. In addition to topical or steroid treatment, elimination of DG requires excellent oral hygiene and replacement of any intraoral ill-fitting prosthesis.

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