ORIGINAL ARTICLE

INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES

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Incidence of oral white lesions in patients attending a private dental hospital

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Article History:

Received on: 26 Jul 2020
Revised on: 24 Aug 2020
Accepted on: 30 Aug 2020

Keywords:

Age groups,
Gender,
Incidence,
Oral cavity,
White lesions

ABSTRACT

The oral cavity is vulnerable to a limitless number of environmental insults; white lesions are common findings in the oral cavity. White lesions in the oral cavity may be benign, premalignant or malignant. Early determination is the most significant single factor in battling oral malignancy and improving endurance rate. So white lesions occurring in the oral mucosa are promptly needed to be identified and treated. The aim of the study was to determine the incidence of oral white lesions occurring among patients visiting a private dental hospital. A total of 10,000 patient data were selected for the study; patients who reported to the dental college between June 2019 to March 2020 were included for the study. This was a retrospective study, and the data were obtained from patient case records, and the data were reviewed for the presence of white lesions. White lesions coexisting with other types of lesions such as red lesions, vesiculoerosive lesions, pigmented lesions etc. have been excluded from the study. The overall incidence of white lesions was found to be 7.3 per 1000 per year. The number of oral white lesions was 0.65% in males and 0.08% in females. The number of Leukoplakia was 26.03% in male, and 1.37% in female, OSMF 24.66% in male and 4.11% in female, Tobacco pouch keratosis 31.51% in males and chemical burn 4.11% in males and 2.74% in females, candidiasis was 2.74% in both male and female. From the present study, we can conclude that the typical white lesion in the oral cavity is tobacco pouch keratosis and most of the lesions belong to the category of potentially malignant disorders hence the timely diagnosis of these lesions is paramount and can minimize the progression of oral cancer.

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ISSN: 0975-7538

DOI: https://doi.org/10.26452/ijrps.v11iSPL3.2959

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INTRODUCTION

The oral cavity is vulnerable to a limitless number of environmental insults because of its exposure to various external agents (Chaitanya *et al.*, 2017; Venugopal and Maheswari, 2016). White lesions are a broad group of heterogeneous lesions which have many different etiological factors. Certain systemic conditions can appear as a white lesion in the oral mucosa, and prompt diagnosis and management can help in minimizing the disease progression and other complications. (Ship *et al.*, 2003;

Subashri and Maheshwari, 2016) White lesions are very common in the oral mucosa. (Maheswari *et al.*, 2018) Lesions appear white in the oral mucosa due to various reasons. Lesions can appear white because of the presence of a pseudomembrane (oral thrush, chemical burn), due to intercellular oedema (leukoedema), due to abnormally increased levels of keratin that can reflect the spectrum of light evenly and because of the constant bathing of the hyperkeratotic tissue in saliva, analogous to the appearance of palms and soles when immersed in water for long periods (Messadi *et al.*, 2003; Misra *et al.*, 2015). The other reason is the reduced vascularity to the oral tissues like in the case of oral submucous fibrosis and pallor of the oral mucosa in case of anaemia. Still, one cannot claim these lessons as 'white' lesions but as pale appearing lesions. Nevertheless, these conditions are also categorized under white lesions of the oral mucosa.

White lesions in the oral mucosa may be a normal anatomic variant, benign, premalignant or malignant lesions (Steele *et al.*, 2015). Certain signs and symptoms such as burning sensation and red appearing areas in the white lesion suggest a malignant change happening in the lesion but are not always completely reliable (Warnakulasuriya and Muthukrishnan, 2018). Hence a thorough history taking, a physical examination must be supported by a biopsy of the suspected white lesion to evaluate the histopathological status for any malignant change (Axell *et al.*, 1984; Chaitanya *et al.*, 2018; Patil *et al.*, 2018). Accordingly, when a clinician confronts a white area on the oral mucosa, the first issue to be elucidated is whether it can be scraped off by means of a piece of gauze or not. If so, a superficial non-keratotic layer such as pseudomembranes, most commonly caused by fungal infections or caustic chemicals, should be suspected (Dharman and Muthukrishnan, 2016; Rohini and Kumar, 2017). Otherwise, white lesions can be attributed to the increased thickness of the keratin layer, which might have been induced by local frictional irritation immunologic reactions or more crucial processes such as premalignant or malignant transformation (Mortazavi *et al.*, 2019; Muthukrishnan *et al.*, 2016).

Epidemiologic investigations give significant data to the comprehension of the predominance rates and seriousness of oral white lesions in a particular populace. It is essential to comprehend the distribution, aetiology, predisposing factors and pathogenesis of oral white diseases. This presents an open door for an ideal recognizable proof, early finding, and appropriate treatment (Bhatnagar *et al.*, 2013; Subha and Arvind, 2019). Many oral white lesions are potentially malignant disorders, and cancer has always been a challenge to the field of medicine and dentistry with the proceeding with a worldwide increment of cases (Bray *et al.*, 2013; Muthukrishnan and Kumar, 2017). Oral cancer is the 11th most common cancer in the world accounting for an estimated 3,00,000 new cases and 1,45,000 deaths in 2012 and 7,02,000 prevalent cases for five years (Bray *et al.*, 2013; Choudhury *et al.*, 2015).

(Sankaranarayanan *et al.*, 1997) uncovered that India has perhaps the most elevated pace of oral malignant growth fluctuating from more than 20 for every 100,000 individuals as contrasted and 10 for each 100,000 in the USA and under 2 for each 100,000 in the Middle East. Oral malignancy represents practically 30% of all malignant growths in India. Prompt determination is the most significant factor in fighting oral malignancy and improving endurance rate. The present research was performed to find the incidence of various oral white lesions occurring among a private institution.

MATERIALS AND METHODS

This is a retrospective study. The data were obtained from patient case records, and the data were reviewed for the presence of white lesions. Ethical approval was obtained from the institutional ethical committee (SDC/SIHEC/2020/DIASDATA/0619-0320). All types of white lesions are included in the study. Still, white lesions coexisting with other types of lesions such as red lesions, vesiculoerosive lesions, pigmented lesions etc. have been excluded from the study, and the data were cross-verified for errors by photographic verification. A total of 10,000 patient data was selected for the study, patients who reported to the dental college, patients between the age group of 20 years to 80 years and between June 2019 to March 2020 were chosen and included for the study. Convenient sampling was the sampling method used. The data were evaluated for oral white lesions by one reviewer. The data collected was entered in Microsoft Excel Sheet, and it was then transferred to IBM SPSS version 20.0 data analysis software, the independent variables were age and gender, and the dependent variables were the oral white lesions. Any incomplete data were excluded, and for finding out the association between variables, chi square analysis was performed.

RESULTS AND DISCUSSION

The overall incidence of white lesions among the participants was found to be 7.3 per 1000 per year.

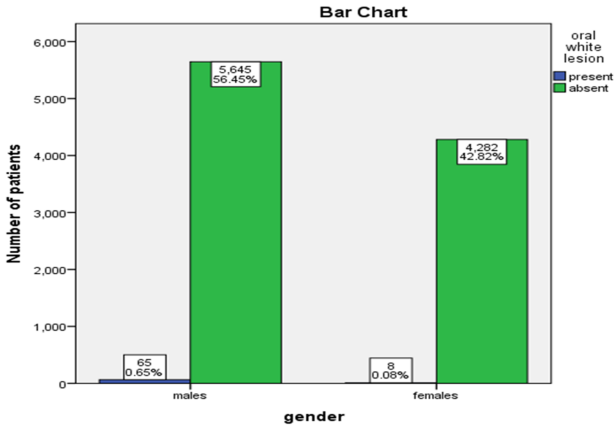

Figure 1: Shows total samples studied and gender distribution

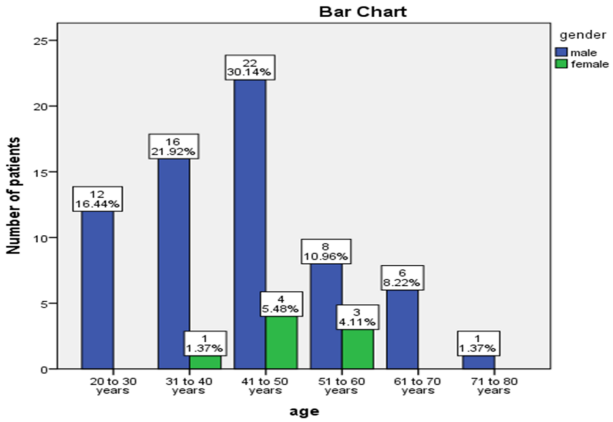

Figure 2: Shows the number of white lesions in different age groups among males and females

From Figure 1, we can infer that among the total participants, 57.1% were males and 42.9% females out of which 1.15% males and 0.19% females had oral white lesions. Figure 2 we can infer that among 20-30 years age group 16.44% of males, 31-40 years age group 21.92% males and 1.37% female, 41 to 50 years age group 30.14% males and 5.48% females, 51-60 years age group 10.96% males and 4.11% females, 61-70 years age group 8.22% males and 71-80 years age group 1.37% males had oral white lesions respectively. From Figure 3 we can infer that tobacco pouch keratosis was common among 20-30 years age group and 31-40 years age group, in the 41-50 years age group 10.96% of leukoplakia, OSMF and tobacco pouch keratosis was seen each. In the 51-60 years age group the most common lesion was leukoplakia 5.48%, In the 61-70 years age group the common oral white lesion was leukoplakia 4.11%, and in 71-80 years age group was leukoplakia 1.37. The association between age groups and different types of white lesions is not statistically significant as the p-value is > 0.05 (p value - 0.222). From Figure 4 we can infer that the number of Leukoplakia was 26.03% in males and 1.37% in female, OSMF 24.66% in males and 4.11% in females, Tobacco pouch keratosis 31.51% in males and chemical burn 4.11% in males and 2.74% in females, candidiasis was 2.74% in both male and female. There is a statistically significant association between the gender and different types of white lesions as the p value is < 0.05 (p value - 0.006).

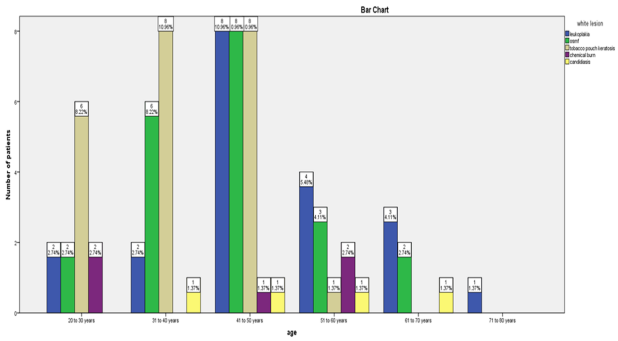

Figure 3: Shows the distribution of types of white lesions in different age groups and their association with age groups

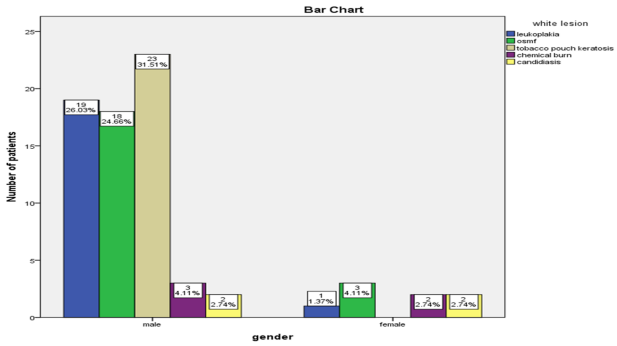

Figure 4: Shows the distribution of types of white lesions in different age groups and their association with age groups

Figure 1, X-axis shows gender, the Y-axis shows the number of patients. Chi square test was performed, and 0.00 is the p value (< 0.05) and was found to be statistically significant. Hence proving that Oral white lesions(Blue) were more common among males (0.65%)than females(0.08%).

Figure 2, The X-axis denotes the age groups, and the Y-axis denotes the patient number. The maximum number of white lesions was found in males (Blue) which constitute 30.14% than females (Green) seen in the age group of 41 to 50 years.

Figure 3, The X-axis denotes the age groups, and the Y-axis denotes the patient number. Chi square test was performed, and 0.222 is the p value (> 0.05) not significant statistically. Leukoplakia (Blue), Oral submucous fibrosis (Green) and Tobacco Pouch keratosis (Grey) was most commonly seen in the age

group between 41 to 50 years.

Figure 4, The X-axis denotes the gender and Y-axis denotes the patient number. Chi square test was performed, and 0.006 is the p value (< 0.05) and is statistically significant. Hence oral white lesions[Leukoplakia(Blue), OSMF (Green), Tobacco pouch keratosis (Grey), Chemical burns (Yellow)]were more common in males than females.

The incidence of oral white lesions is a significant factor for the assessment of the oral wellbeing of any populace (Sholapurkar *et al.*, 2008). In the present study, A total of 10,000 patient data was reviewed in the study out of which 73 patients were diagnosed with oral white lesions. The overall incidence of oral white lesions was found to be 7.3 per 1000 per year or 0.73%. (Al-Maweri *et al.*, 2018) in a similar study, stated that the incidence of the oral white lesion in the Yemeni population is 25.2%. (Al-Maweri *et al.*, 2018), in another study by (Ghosh *et al.*, 2017) in Kolkata, India, the incidence of chronic white lesions was 76.6%, The variation in incidence is high in this study because the study was conducted among a specific sample group which was patients presenting with oral white lesions for more than four weeks. Still, the present study was conducted among a random sample group. While searching the literature, similar studies conducted by (Shulman *et al.*, 1988) in the U. S population had the prevalence of 10.26% for oral mucosal lesions, (Splieth *et al.*, 2007) in a study conducted in Germany had 11.83% prevalence, (Cebeci *et al.*, 2009) showed the prevalence in Turkish population was 15.5%, (Al-Mobeeriek and Aldosari, 2009) in the study conducted in Saudi at 15.0%, and (Shivakumar *et al.*, 2010) in the study conducted in Bangalore, India showed 11.33%.

From Figure 1, the number of oral white lesions was 0.65% in males, and 0.08% in females, (Bhatnagar *et al.*, 2013) in a similar study stated that the number of oral white lesions was 8.87% in male and 1.57% in female. From Figure 2, among different age groups, the maximum number of white lesions in males was 30.14%, and females were 5.48% both seen in the 41 to 50 years age group. (Bhatnagar *et al.*, 2013) in a comparable report in Uttar Pradesh expressed that lesions were increasingly pervasive in those aged 40-44 years with a significant male preference at 12.6% and female 4.3%, there is a variation in the values compared to present study because of the differences in the study population and the age groups of the patients in both the studies.

From Figure 3, the common white lesions among different age groups were Leukoplakia, OSMF and tobacco pouch keratosis each 10.96% between 41-50 years, chemical burn 2.74% between 51-60 years of age and candidiasis 1.37%. Chi square test was performed to find out the association between age and different types of oral white lesions, and the p value was 0.222 (>0.05). Hence it was found that there was no significant association between age and different types of oral white lesions. A similar study by (Rathore *et al.*, 2010) showed that the common white lesion was Leukoplakia and OSMF 1% each. From Figure 4, the common white lesion in males is tobacco pouch keratosis which is 31.51%, and females are OSMF 4.11%. Chi square test was performed to find out the association between gender, and the types of white lesions and the p value was 0.006 (<0.05). It is understood that there is a statistically significant association between gender and type of white lesions. (Bhatnagar *et al.*, 2013) in a similar study stated that common white lesion in males is Leukoplakia 2.38% and female is candidiasis 0.88%. There is variation in the values from the present study because the study was conducted to identify all the oral mucosal lesions, which included a part of white lesions also. Still, the present is specific only for white lesions.

(Simi *et al.*, 2013) in a similar study in Kerala stated that the common white lesion was oral submucous fibrosis 3.6% and oral candidiasis 5.10%, Rathore *et al.* (2010) in a similar study in Maharashtra stated that commonly observed oral white lesions ere OSMF, oral lichen planus, leukoplakia and oral candidiasis. (Sudhakar *et al.*, 2011) in Eluru, Andhra Pradesh, India, discovered aggregate of 1489 lesions in which 929 mucosal changes were either ordinary mucosal variations or developmental abnormalities. In another examination by (Jahanbani *et al.*, 2009) oral developmental abnormalities were 49.3%, Fordyce granules at 27.9%, fissured tongue 12.9%, leukoedema 12.5%, and hairy tongue 8.9%. Another investigation by (Al-Mobeeriek and Aldosari, 2009) King Saud University, Riyadh, Saudi Arabia, found that the most common lesion was Fordyce granules 3.8%, and leukoedema at 3.4%

The findings from the present study add to the consensus of the previous similar studies. The limitations of the present study were that only the major type of lesion was evaluated in the study and the subtypes of the white lesions were not explored, so further studies needed to be done in a multicentric manner which can elaborate on the clinical subtypes of the white lesions which helps in acquiring a more intricate data which will help in better diagnosis and management of the disease.

CONCLUSION

Oral white lesions are common in the dental practice, and the knowledge about their epidemiology is paramount. From the present study, we can conclude that incidence of oral white lesions among the participants was found to be 7.3 per 1000 per year and the common white lesion in the oral cavity is tobacco pouch keratosis. Most of the lesions belong to the category of potentially malignant disorders; hence the timely diagnosis of these lesions is paramount and can minimize the progression of oral cancer. Also, more awareness of oral health and about the harmful effects of tobacco might help in reducing the occurrence of potentially malignant lesions.

Funding Support

The authors declare that they have no funding support for this study.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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