

## A Study on Histological Evaluation of Leukoplakia and its Relation with Oral Habit

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### ABSTRACT

**Background:** Oral cancer is often preceded by specific oral lesion and oral condition that are called pre-cancer. The most common pre-cancerous lesion is leukoplakia. Leukoplakia is the most prevalent precancerous lesion of the oral mucosa. The prevalence of leukoplakia ranges from 0.2 to 4.9 %. Leukoplakia simple means "White Patch" and it has been used in general sense to describe any white lesion in the mouth. The term leukoplakia was coined by a Hungarian dermatologist Schiwimmer in 1877.

**Materials and Method:** Oral examinations were done under sufficient light using two mouth mirrors. The diagnosis of leukoplakia was based on the clinical ground. A total number of 18,600 patients were screened and 60 patients of oral leukoplakia were selected for this study. Specially prepared case sheet were issued for recording the clinical data of these patients. Along with detailed medical and dental history all the patients were interviewed regarding age, occupation, socioeconomic status, oral habits and subjective and objective feature etc. To be very accurate and factual on oral habit no attendant were allowed to help the patient in eliciting answer to our question which has been prepared very carefully.

**Result:** Out of 60 Leukoplakia patient 85% were male and 15% were female. Male/Female ratio was 5.66 1. The peak incidence of leukoplakia occurred between 3rd. and 4th decade of life in both sexes. In Religion wise distribution of cases Hindus outnumbered the Muslims being 87% of the cases. In distribution of cases according to socio-economic condition Incidence of Leukoplakia is higher (50.0%) in the middle income group. Distribution of cases according to dietary habit Leukoplakia, patient were predominated by non-vegetarian 95.0%.

**Conclusion:** The chief complain in oral Leukoplakia is burning sensation but more than 40% lesion are asymptomatic. Buccal mucosa and commissural region are favored sites for the development of Oral leukoplakia. Hyperkeratinization one Acanthosis was the commonest histological observation in oral Leukoplakia. Leukoplakia is a premalignant disease.

**Keywords:** leukoplakia, epithelial dysplasia, tobacco.

### INTRODUCTION

In the present era due to increased consciousness there is a progressive reduction in

the dental caries and the periodontal disease, the demand and need for dental treatment is changing, oral mucosal diseases are providing more

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challenging diagnostic and therapeutic problem. Oral cancer is often preceded by specific oral lesion and oral condition that are called pre-cancer. The most common pre-cancerous lesion is leukoplakia.<sup>1</sup> Leukoplakia is the most prevalent precancerous lesion of the oral mucosa. The prevalence of leukoplakia ranges from 0.2 to 4.9 %. <sup>2</sup> Leukoplakia simple means "White Patch" and it has been used in general sense to describe any white lesion in the mouth. The term leukoplakia was coined by a Hungarian dermatologist Schiwimmer in 1877.<sup>3</sup>

Clinically leukoplakia is classified as homogenous type, ulcerated type and speckled or Nodular Type.<sup>4</sup> One of the important challenges before workers in the field of oral pathology is prevention of oral cancers which is better achieved by knowing the clinical character and etiological factor of the cancerous and etiological factor of the cancerous and precancerous lesion. A careful clinical study can prevent any precancerous condition to become cancerous. Since the use of tobacco in various forms is rampant in all part of Bihar, this study will be helpful to know its impact on oral diseases, more significant to oral malignancy.

## MATERIAL AND METHOD

The department of Oral Pathology and Oral diagnosis of Patna Dental Collage and Hospital, Patna and the department of Pathology, PMCH, Patna was the main place of work for the study. The patient attending the oral diagnosis department of Patna Dental Collage and Hospital were examined for the presence of Oral leukoplakia. Oral examinations were done under sufficient light using

two mouth mirrors. The diagnosis of leukoplakia was based on the clinical ground. A total number of 18,600 patients were screened and 60 patients of oral leukoplakia were selected for this study. Specially prepared case sheet were issued for recording the clinical data of these patients. Along with detailed medical and dental history all the patients were interviewed regarding age, occupation, socioeconomic status, oral habits and subjective and objective feature etc. To be very accurate and factual on oral habit no attendant were allowed to help the patient in eliciting answer to our question which has been prepared very carefully. Routine hematological investigation like TLC, DLC, %Hb, R.E. of Urine, Blood Sugar level, Bleeding time, Clotting time etc, were done in all the diagnosed case.

## RESULTS

The present study comprises of 60 patients of Oral leukoplakia diagnosed after screening 18,600 patients attending the outdoor department of Patna Dental Collage and Hospital, Patna-4. The incidence of oral Leukoplakia was 0.32 percent, Out of 60 Leukoplakia patient 85% were male and 15% were female. Male/Female ratio was 5.66 1. The peak incidence of leukoplakia occurred between 3rd and 4th decade of life in both sexes. In Religion wise distribution of cases Hindus outnumbered the Muslims being 87% of the cases. In distribution of cases according to socio-economic condition Incidence of Leukoplakia is higher (50.0%) in the middle income group. Distribution of cases according to dietary habit Leukoplakia, patient were predominated by non-vegetarian 95.0%.

Table 1: Distribution of Patient according to oral habits (n=60)

| Oral Habit                                 | No. of. Cases | Percentage |
|--------------------------------------------|---------------|------------|
| 1. Smoking                                 | 11            | 11.33%     |
| 2. Chewing<br>(khaini, Pan, Panmasala etc) | 17            | 28.33%     |
| 3. Mixed<br>(Both chewing & smoking )      | 18            | 30.00%     |
| 4. Alcohol with smoking<br>and/or Chewing  | 7             | 11.67%     |
| 5. No Known habit                          | 7             | 11.67      |
| Total                                      | 60            | 100.0      |

Approximately 90% Patient had some oral habit. The highest percentage 30.0% was the use of mixed habits.

Table 2: Distribution of cases according to clinical feature (n=60)

| Subjective Feature                | No. of .Patient | Total Percentage |
|-----------------------------------|-----------------|------------------|
| 1. Burning sensation & discomfort | 39              | 65.0%            |
| 2. Pain                           | 15              | 25.0%            |
| 3. Tightness                      | 21              | 35.0%            |
| 4. Dryness                        | 0               | 0                |
| 5. Asymptomatic                   | 25              | 41.67            |

The maximum no. of patient 65.0% complain of burning sensation and discomfort but 41% has no complain.

Table 3: Distribution of Cases according to site of involvement (n=60)

| Location              | No. of. Cases | Total Percentage |
|-----------------------|---------------|------------------|
| 1. Labial Mucosa      | 9             | 8.74%            |
| 2. Commissures        | 34            | 33.0%            |
| 3. Buccal Mucosa      | 46            | 44.66            |
| 4. Gingiva            | 6             | 5.82%            |
| 5. Palate             | 2             | 1.94%            |
| 6. Tongue             | 3             | 2.92%            |
| 7. Floor of the mouth | 1             | 0.97%            |
| 8. Alveolar ridge     | 2             | 1.95%            |
| Total                 | 103           | 100.0%           |

The Most common site of oral Leukoplakia was buccal mucosa followed by commissures.

Table 4: Distribution of Cases according to site of involvement (n=60)

| Sl. No. | Type of Lesion       | No. of. Cases | Percentage |
|---------|----------------------|---------------|------------|
| 1.      | Hyperkeratosis       | 57            | 95.0%      |
| 2.      | Acanthosis           | 37            | 61.66%     |
| 3.      | Ulceration           | 4             | 6.66%      |
| 4.      | Inflammation         | 55            | 90.16%     |
| 5.      | Epithelial Dysplasia | 7             | 11.66%     |
| 6.      | Sq. cell carcinoma   | 2             | 3.33%      |

Hyperkeratosis is the most common histological finding in Leukoplakia.

## DISCUSSION

The present study was conducted among the patients attending the outdoor department of Patna Dental College and Hospital, Patna-4. It should be emphasized, however, that most of the patients attended had dental problem other than leukoplakia, and very few patients came because of leukoplakia lesion alone.

In the present study the overall prevalence of leukoplakia among the 18600 dental patients was 0.32 percent. This prevalence rate is similar to the observation made by Mehta F.S. et al<sup>2</sup> (1969)

with the prevalence of .02 percent found among the people of Bihar. This prevalence rate coincides with a study of more than 50000 villagers in different geographic location in India conducted by Mehta and others<sup>2</sup>, who repeated a prevalence ranging from .02 to 409%. Thus the present prevalence rate is similar to that of the studies conducted in Bihar but much less than that of Andhra Pradesh probably because of the fact that Andhra Pradesh is one of the main producer of tobacco & tobacco products, hence there is more consumption of tobacco at Andhra Pradesh, giving rise to more number of leukoplakia patients. In the present

study, among 60 Leukoplakia patient 51 were male i.e. 85% and the rest of the patient i.e. 15% were female. The male: female prevalence rate in the present series was 5.66:1. The dominance of male patient affected with leukoplakia was due to the fact that males are exposed to different oral habit more than that of females. The higher incidence of different tobacco habit in males can be explained by the fact that males are frequent visitors outside the home. They are more active and social hence they are more liable to pick up the habit. In contrast the females are mostly confined to their houses. They are mostly governed by male's members of the family. They are not free as male socially, economically and culturally to pick up any oral habit. This data was compatible with the study done by Mehta F.S.<sup>5</sup> et al in the 1972 where male: female prevalence rate was 4:1.

In the present study the leukoplakia patients were divided into seven groups. According to their age it is evident that oral leukoplakia is prevalent in 3rd, 4th, 5th & 6th decade of the life. This finding is corroborative to the observation made by C.A. Waldron et al<sup>6</sup>, where leukoplakia occur chiefly in the 5th, 6th, and 7th decade of life. In this observation the maximum number of patients among both the sexes falls in between 3rd and 4th decade of life. These is due to the fact that there is increased tendency for the use of tobacco among the teen ager and in such cases leukoplakia lesion appear after few year and precipitate in 3rd & 4th decade of life.

In the present study, it shows that in religion wise distribution of leukoplakia patient, Leukoplakia is quite high in Hindus than in comparison to Muslim. The total number of Hindus patient in this study was 52 i.e. 87% and the number of muslim patient was 8 i.e. 13%. The difference is probably because of the fact that less number of Muslim patient were reported to Patna Dental College and Hospital for Dental treatment. The high percentage of leukoplakia in Hindus may be due to the fact that Hindus are in majority in and around Patna. Similar result was found from the study of Wahi et al 97.6% and Muslim was 2.12%.

The prevalence of leukoplakia in different socioeconomic status was screened. In this study people having annual income less than Rs.15000

were kept in lower income group, people having annual income more than Rs.15000 but less than Rs.50000 were kept in middle income group and income tax payee were kept in high income group. The observation showed that incidence of leukoplakia is quite high in middle income group 50.0% followed by lower income group 36.67% and high income group 13.335. This can be explained on the basis that middle income group of people were more used to of different habits like chewing, smoking & drinking. Moreover in comparison to higher income group, middle income group & lower income group of people have poor oral hygiene which also contributes to the development of leukoplakia. In the analysis of different dietary habits of 60 patient of oral leukoplakia, it was found that 57(95 percent) patients were non vegetarian while 3 (5percent) were vegetarian. In a similar study conducted by Mehta F.S.<sup>2</sup> et al in 1969 and Wahi et al<sup>5</sup> in year 1970 no relationship could be established between leukoplakia and dietary habit. The pronounced prevalence of oral leukoplakia among non-vegetarian is probably because of the fact that the people of Patna are more habituated to non-vegetarian food than only vegetarian food.

In analyzing the nature and role of oral habit among the leukoplakia patient, it was observed that the highest percentage of patient (30%) were in the mixed habit group Table I. Among the 60 patient 88.33% patient had some oral habit in comparison to 11.67% of patient having no habit. The present observation were corroborative with the observation made by Pindborg J. J.<sup>7</sup> et al in the year 1967 and observation made by Mehta F.S et al<sup>8</sup> in year 1969, who concluded that in Gujarat, Kerala and Andhra Pradesh mixed habit are associated with quite high figure of leukoplakia. But the present study is contradictory to the study made by Vaish R.P. et al<sup>2</sup> who concluded that leukoplakia is more common in chewing habit, especially pan. The prevalence of leukoplakia among mixed habit group may increase due to increased popularity of Pan Masala and cigarette among the younger generation. From the present study it can be stated that mixed oral habit should be given due importance for the development of oral leukoplakia. In this study different oral habits are categorized as

### 1. Smoking Habit: Cigarettes

Bidi

Chilum

Cigar, Pipe etc.

### 2. Chewing Habit: Khaini (Tobacco with slaked lime)

Pan with zarda

Pan Masala

Zarda with Betel quid

Gul

### 3. Mixed chewing and smoking habit

### 4. Alcohol with smoking and/or chewing.

The clinical feature of leukoplakia lesion among all the 60 patient were observed in this study Table I and it was observed that many patients had multiple subjective feature. The maximum number of patient 39 (i.e.65 percent) had complained of burning sensation followed by feeling of tightness in 21 (i.e. 35 %), while 25 patients (i.e. 41.63 percent) were asymptomatic i.e. without any complain or ignorant about the lesion inside the mouth. Thus the present study showed that a higher percentage of patients remain ignorant about the presence of the lesion and in due course they may develop a malignant lesion.

The anatomical distribution of leukoplakia lesion among the 60 patient was done. The present study revealed that the commonest site was the buccal mucosa 44.66 percentage followed by the commissural region 33 percent Table IX. This finding is in agreement with the study done by R. P. Vaish et al<sup>7</sup> in year 1978 in what the commonest site was buccal mucosa 54.6% followed by labial commissural 33.4%. It has been observed that the chewing habit favor the leukoplakia in buccal and labial mucosa whereas smoking habit favors the leukoplakia in commissures. This anatomical distribution of leukoplakia is also similar to the study conducted by Mehta F.S.<sup>2</sup> et al. They also concluded that the distribution of leukoplakia was chiefly associated with the pattern of oral habit. The present observation also confirms

the role for tobacco as a etiological factor for the development of leukoplakia.

A detailed histological analysis was done of all the 60 patients of oral leukoplakia. This study revealed that the hyperkeratosis in 57 cases i.e. 95% is the most common finding followed by the inflammation and acanthosis (61.66%). Ulceration is present in 4 cases (i.e. 6.66%) epithelial dysplasia is present in 7 cases 11.66%. Out of 60 patient of oral leukoplakia in the present series 2 cases (3.33%) were microscopically diagnosis as Sq. cell carcinoma Table IV. This study was close the study conducted by Charles A. Waldron et al<sup>9</sup> in 1975 in which microscopic study showed that 80.1% of leukoplakia were varying combination of hyperkeratosis and acanthosis without evidence of epithelial dysplasia, epithelial dysplasia was noted in 12.2% and Sq. cell carcinoma was diagnosed in 3.1% of leukoplakia. This study also coincide with the study conducted by Mehta F.S et al<sup>8</sup> who concluded that the epithelial atypia ranged from 3.0% to12.4% in the 4 states in India.

The histological study states that the histological status of leukoplakia may range from hyperkeratosis, acanthosis, and epithelial dysplasia up to Sq. cell carcinoma.

Hyperkeratosis was the most common finding and the dominating type of hyperkeratosis was hyperorthokeratosis. Lymphocytic infiltration was also present in about 55 cases. Acanthosis with deepening of rete pegs were present in more than 60% of cases. Epithelial Dysplasia was present in 7 cases and Sq. cell carcinoma was present in 2 case out of 60 leukoplakia patient, strongly suggest that leukoplakia is premalignant diseases. The present work establishes that oral habits favor the development of leukoplakia which is a premalignant disease. Hence the deleterious habits among the population should be discouraged by health education, motivation and legislation.

## SUMMARY & CONCLUSION

In the present study 18600 Dental patients were examined and 60 patients were diagnosed being affected with oral leukoplakia. The study came with the following observation and conclusion in the prevalence rate of oral Leukoplakia is 0.32%.

- Male are more prone to develop oral Leukoplakia than female, Male: Female ratio is 5.66: 1.

-Leukoplakia is more common in 4th & 5th decade of life.

-Hindus are found to be more affected with leukoplakia in Bihar than the people belonging to other community.

-Lower middle income group people are more prone to develop oral Leukoplakia.

-Non vegetarian have more Leukoplakia lesion in comparison to vegetarian

-Among the various oral habits, Leukoplakia is observed more in individual exposed to mixed oral habits.

-The chief complain in oral Leukoplakia is burning sensation but more than 40% lesion are asymptomatic.

-Buccal mucosa and commissural region are favoured sites for the development of Oral leukoplakia.

-Hyperkeratinization one Acanthosis was the commonest histological observation in oral Leukoplakia.

-Leukoplakia is a premalignant disease.

#### CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

#### REFERENCES

1. P.C.Mehta, R.B. Bhosle, P.R. Murti, D.K. Doftary, F.S. risk in oral precancerous lesion in India with

special reference to Bodular leukoplakia, Cancer 63, June 1989.

2. F.S. Mehta, J.J. Pindborg, P.C. Gupta, Daflary D.K. Epidemiologivak and histological studied of oral cancer and leukoplakia among 50,915 villager in India. Cancder volume 24, 1969.

3. Vaish R P, Jena D C. Prevalence of leukoplakia in relation to tobacco habit in southjernm Orissa, Jou. Indian Dent. Asso, 54, 415-425.

4. Sahiar, Daftary and Mehta, Cytological and Histological Keratinization studies in Leukoplakia of the mouth. Jour of Oral Path and Medicine, 1975.

5. Mehta F. S., Gupta P. C., Daftary D K, Pindborg J J and Choksi S K, 1972. An epidemiologic study of oral cancer and precancerous condition among 101761 villagers in Maharashtra India. Int J Cancer 10,134.

6. C.A. Waldron & W. C. Shafte, Leukoplakia Revisited & Clinic pathological studies of 3256 oral leukoplakia cancer volume 36, 1975.

7. Pindborg J.J., Kiaer J, Gupta P C, Chawla T N. 1967 studies n oral leukoplakia. BULL WHO 37: 100.

8. Pindborg J J, Chawla T N, Mishra R K, Nagpal R K and Gupta V K (1965). Frequency of oral carcinoma, leukoplakia Leukokeratosis, Leukoedema, Sub mucous fibrosis and Lichen Planus in 10,000 Indian in Lucknow (U.P) India - A preliminary report, Jour Dent Res 44 ; 615.

9. C A Waldron and W G Shafer. Leukoplakia Revisited - A clinicopathologic study of 3256 Leukoplakia. Cancer 36, 1386-1392, 1975.