Scientific Productions on Leucoplakia from Central India- A Bibliometric Analysis.

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Abstract:

Background: Leukoplakia is the term used to recognize white plaques of questionable risk having excluded (other) known diseases or disorders that carry no increased risk for cancer. Leukoplakia is clearly a clinical term with no specific histology. The histological sections reveal atrophy or hyperplasia (acanthosis), hyperkeratosis and with or without epithelial dysplasia or carcinoma. WHO states that based on geographical location prevalence of oral leukoplakia ranges from 0.1% to 10.6% and India has a significantly higher number of cases. This article focused on extracting the scientific literature on leukoplakia from Central India published in Web of Science database.

Methodology: Using specified Search Query with selected keywords, the Web of science database was accessed and publications arising from Central India were extracted. The file was imported and analysed using R-Studio Application.

Results:Main list of publications included 188 documents from 125 sources. Majority were Journal articles. Most corresponding authors were from India whereas a few authors were from 9 other countries including US, France, Canada and Germany. Collaboration Index was 4.39. Annual Percentage Growth Rate of publications was 3.21.

Conclusion: Scientific Productions on Leukoplakia from Central India as a special entity are on rise over a period of last 10 years. Researchers are more focussed on searching the rate of progression of leukoplakia and effectiveness of early diagnosis and treatment on the progress of leukoplakia to well-developed squamous cell carcinoma.

Keywords: Leukoplakia, Bibliometrics, Scientific Productions

Introduction:

Oral leukoplakia is categorised as one of the potentially malignant disorder (PMD) of the oral mucosa.(1)Terminology leukoplakia is used to denote a white lesion that is precancerous. In Greek language the word leucos means white and plakia means patch. (2) Leukoplakia as per World Health Organisation is defined as - "a white plaque of questionable risk having excluded (other) known diseases or disorders that carry no increased risk for cancer."(3) Leukoplakia is the term used to recognize white plaques of questionable risk having excluded (other) known diseases or disorders that carry no increased risk for cancer. Leukoplakia is clearly a clinical term with no specific histology. The histological sections reveal atrophy or hyperplasia (acanthosis), hyperkeraosis and with or without epithelial dysplasia or carcinoma. Leukoplakia clinically presents as a single lesion or a picture of multiple lesions with changes in the oral mucosa locally. The distribution in oral cavity differs with the fact that it may affect any site depending upon gender, tobacco habits along with regional variation. The various forms of leukoplakia include proliferative verrucous leukoplakia, oral erythroleukoplakia, sublingual keratosis, candidalleukoplakia and oral hairy leukoplakia. (4) The behaviour of this potentially malignant lesion is variable but at the same time the malignant transformation tendency can be assessed. WHO states that based on geographical location prevalence of oral leukoplakia ranges from 0.1% to 10.6%. (5) According to risk factors enlisted by Warnakulasuriya et al. for malignant transformation in potentially malignant disorder, leukolpakia is one of them among others.(3)

In India, leucoplakias mainly observed in association with tobacco habit for several years particularly smoking type of tobacco but also associated with chewing and other forms as well. Therefore health education along with counselling and behavioural therapies is necessitated for prevention at a primary level.(4)

Evidence based medicine has revolutionized the health-care system as it provides personalized treatment to the patients specifically addressing to the condition (6). The high potential of malignant transformation necessitates its early diagnosis to prevent the malignant transformation and improve the prognosis of the patients (7). Extensive research on leukoplakia is continuously updating the field of diagnosis and treatment options thereby enabling clinicians to choose the best patient specific treatment option.Although, presence of a number of documented studies may result in the inefficiency to identify standard and major research in a particular sector. Bibliometrics is a statistical analysis of publications including articles in journals, books, book chapters. It proves to be an effective way to present thescientific productions to the scientific community (8,9). The analysis includes the method of citation analysis to assess the research production that is measured by calculating the number of times a research article is cited in other publications (10). Furthermore, the success of an academia can be reflected by the authorships of the top cited research articles (11,12) and predict the geographical distribution of particular research topic (18). Hence, a bibliometric analysis can serve as an effective way to analyse and assess an authoritative research activity, which has tailored the healthcare system, and further cultivated influential innovative ideas to enhance the scientific productions.

Bibliometrics is the analysis of books , articles and other publications using statistical methods. In the field of library and information technology, bibliometric methods are also employed. Scientometrics is the sub-field of bibliometrics which is concerned with the study of scientific publications. Analysis of citations is a commonly used bibliometric method based on the construction of a quotation graph, a network or graph representation of quotations between documents. Many researchers use bibliometric methods to examine the impact of their field, the impact of a group of researchers, the impact of a specific paper or

for classifying the impactful papers from a particular field.Apart from this, Bibliometrics has a variety of other applications including in descriptive linguistics, reader use assessment and thesauri growth, etc .This bibliometric analysis focuses on the scientific productions on Leukoplakia affiliated to the Health Sciences University from Central India over a period of last 15 years.

Methodology:

This was a cross sectional study. A selection of bibliographic data from the most renowned scientific database, ISI Web of Science (WoS)is the basis for this study. We conducted a keyword search in the WoS database to collect specific bibliography data in July 2020.Web of Science Database was accessed with the specific Search query-"KP=(Leukoplakia* OR speckled* OR nodular* OR "verrucous leukoplakia") Refined by: COUNTRIES/REGIONS: (INDIA)". List of total 188 publications were retrieved through this search and the Bibtex file was downloaded. This file was imported to R-studio Application for further analysis.Bibliometric methods were used to trace relationships among publications from academic journals.

Results:

Main list of publications included 188documents from 125 sources (Journals, Books, etc.) displaying 797 keywords over the period of1991 – 2020.

 Details of Document types:

1. JOURNAL ARTICLES-136
2. ARTICLE, EARLY ACCESS-1
3. ARTICLE, PROCEEDINGS PAPER-2
4. EDITORIAL MATERIAL-10
5. LETTER-4
6. PROCEEDINGS PAPER-1
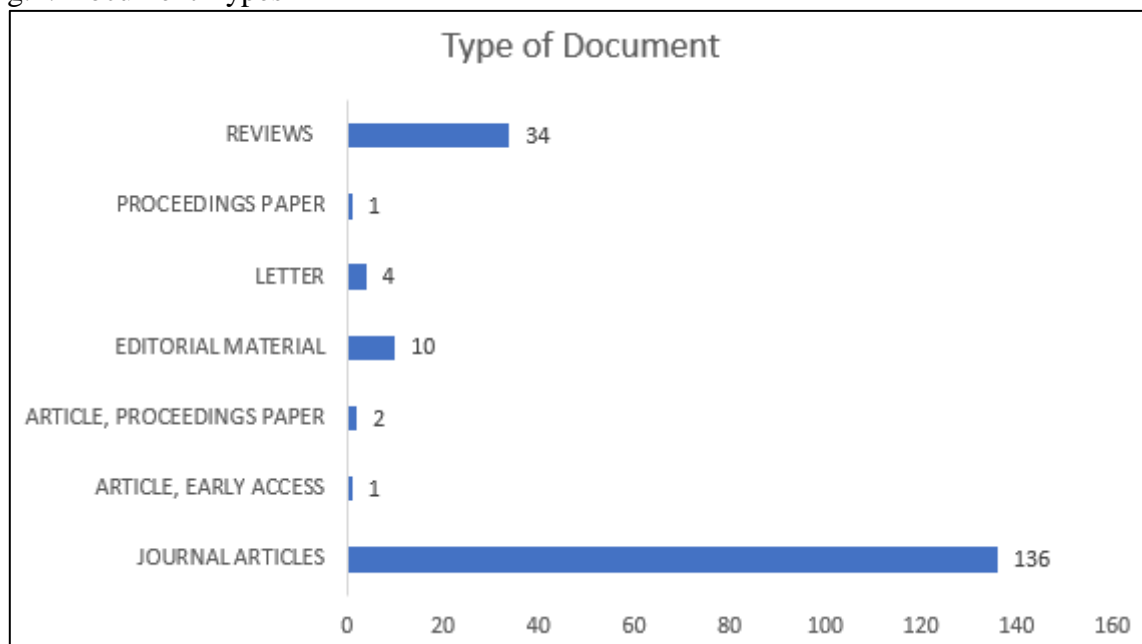7. REVIEWS-34

Fig.1: Document Types

Fig.1 shows the type of document publish. In Web of Science database documents included 136 Journal Articles, 34 Review, 4 Letter, 10 Editorial Material , 2 Article proceeding Paper , 1 Article Early Access and 1 Proceedings Papers.

Corresponding Author's Countries

Country-wise No. of Articles
1. INDIA- 160
2. USA -11
3. FRANCE-5
4. AUSTRALIA-1
5. BELGIUM-1
6. BRAZIL- 1
7. CANADA - 1
8. GERMANY -1
9. JAMAICA -1
10. KUWAIT-1

The List of Most Relevant Sources Included following List-

Source-wise No. of Articles

1. ORAL ONCOLOGY - 11
2. JOURNAL OF CANCER RESEARCH AND THERAPEUTICS   - 7
3. JOURNAL OF ORAL PATHOLOGY & MEDICINE -7
4. JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH   - 6
5. JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS - 5
6. JOURNAL OF INVESTIGATIVE AND CLINICAL DENTISTRY -5

7. INDIAN JOURNAL OF PATHOLOGY AND MICROBIOLOGY -4
8. ORAL DISEASES - 4
9. ASIAN PACIFIC JOURNAL OF CANCER PREVENTION   - 3
10. DIAGNOSTIC CYTOPATHOLOGY - 3

Fig. 2: Three Field Plot of Authors, Keywords and Source
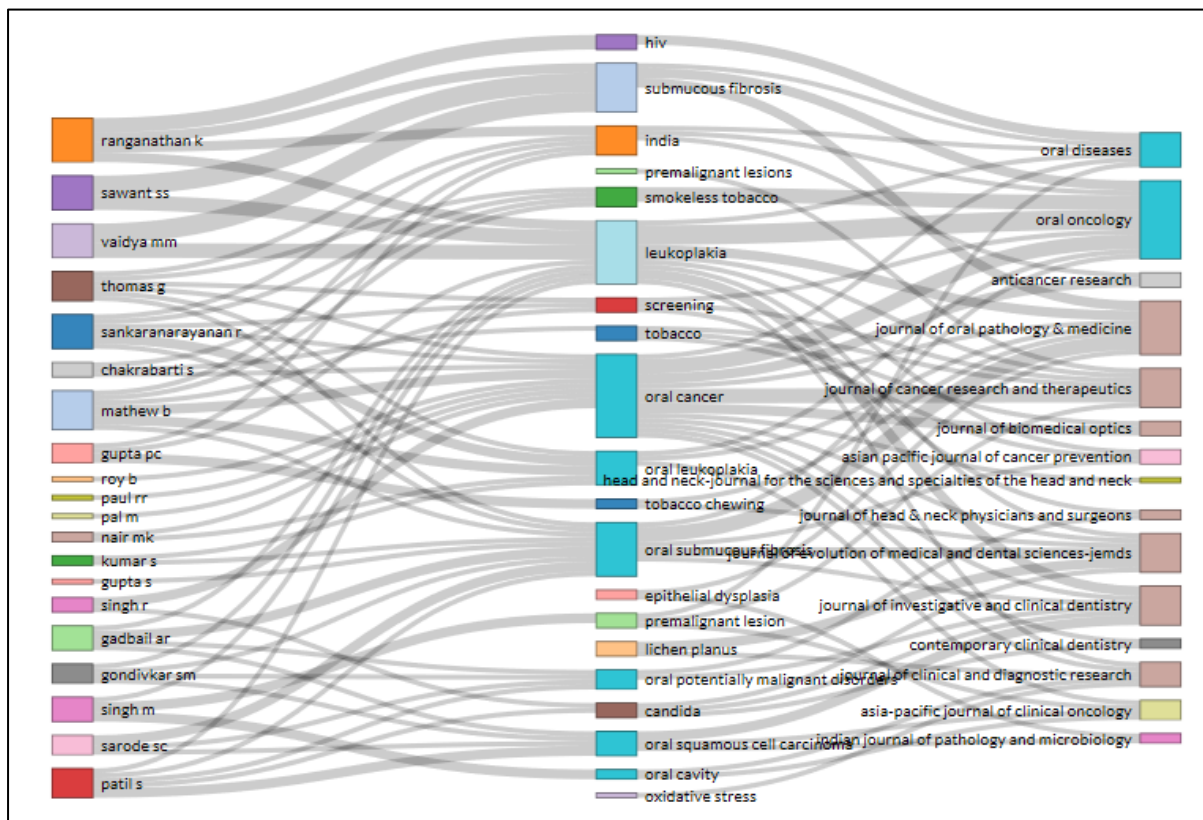
The interconnections between journals , Keywords and Authors can offer useful insights. Therefore, in Figure 2, we present an innovative three-field plot, showing the interactions between the most relevant publishing outlets (left), author, keywords (middle) and Journal (right) within the big data and AI in maritime research.
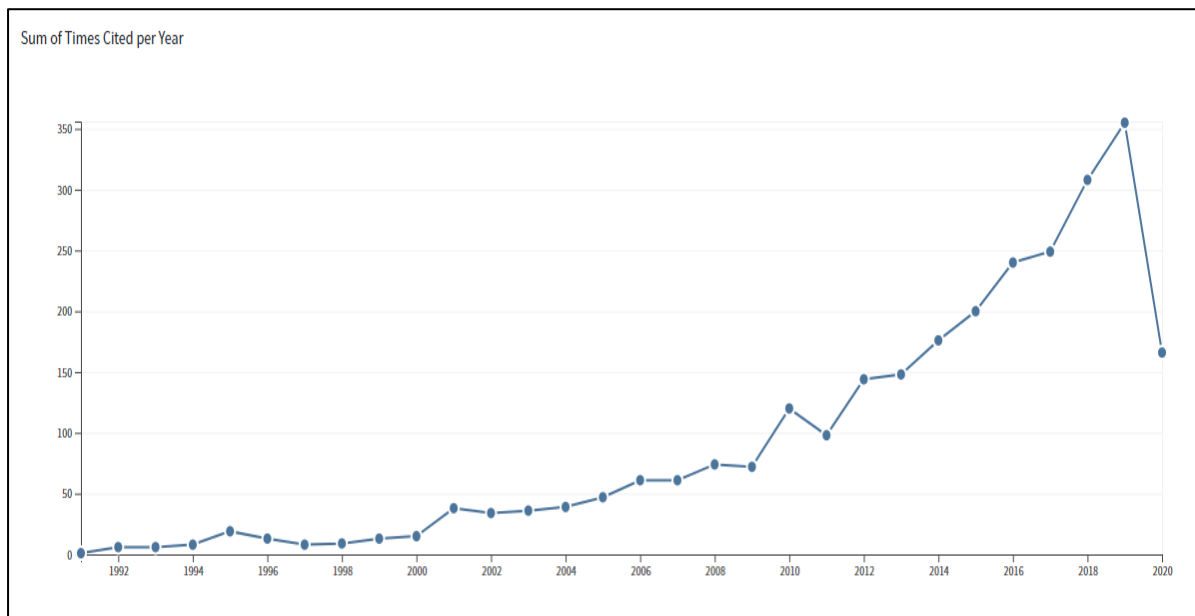
Fig.3: Citations Graph
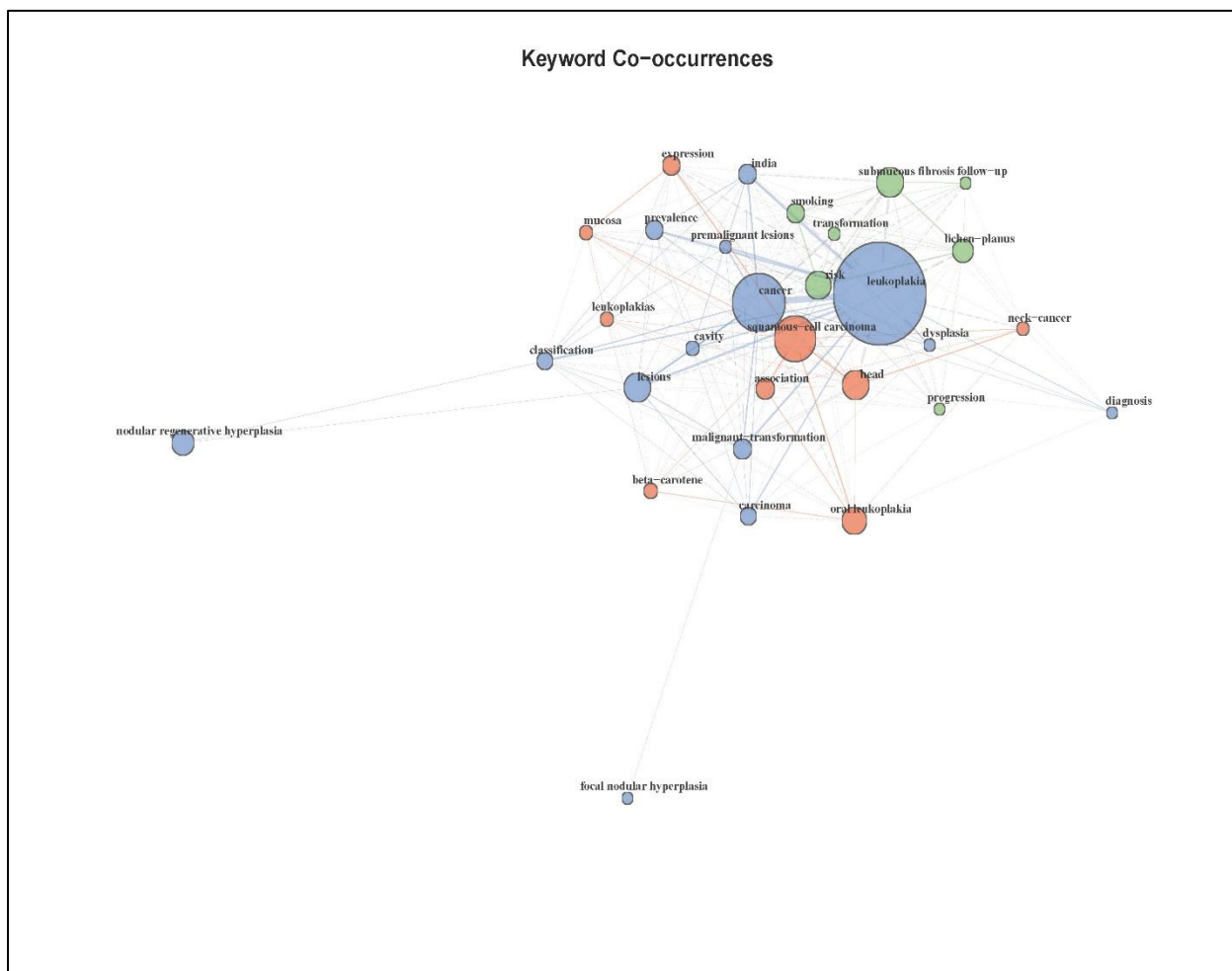

Fig. 4: Keyword Co-occurrences

Fig. 4 The connection of management research topics could be intuitively exposed. The size of nodes may reflect keyword frequency: the higher keyword frequency, the bigger node size. The line thickness is proportional to the closeness of the ties between two keywords, the thicker line between two terms, the closer the Is Leucoplakia having the highest keyword frequency. Cancer, diagnosis has a higher level too. The lines of reasoning between two terms, like Leucoplakia, cancer, diagnosis, and malignant transformation, reflect deeper relationships. Conversely, we also find some keywords easily, such as Complex System, Information Transform, has lower frequencies whose node size is high.And there is no line connecting to other keywords which indicates that these keywords are on the margins of research.

Fig. 5: Scientific Production

Annual Scientific Production
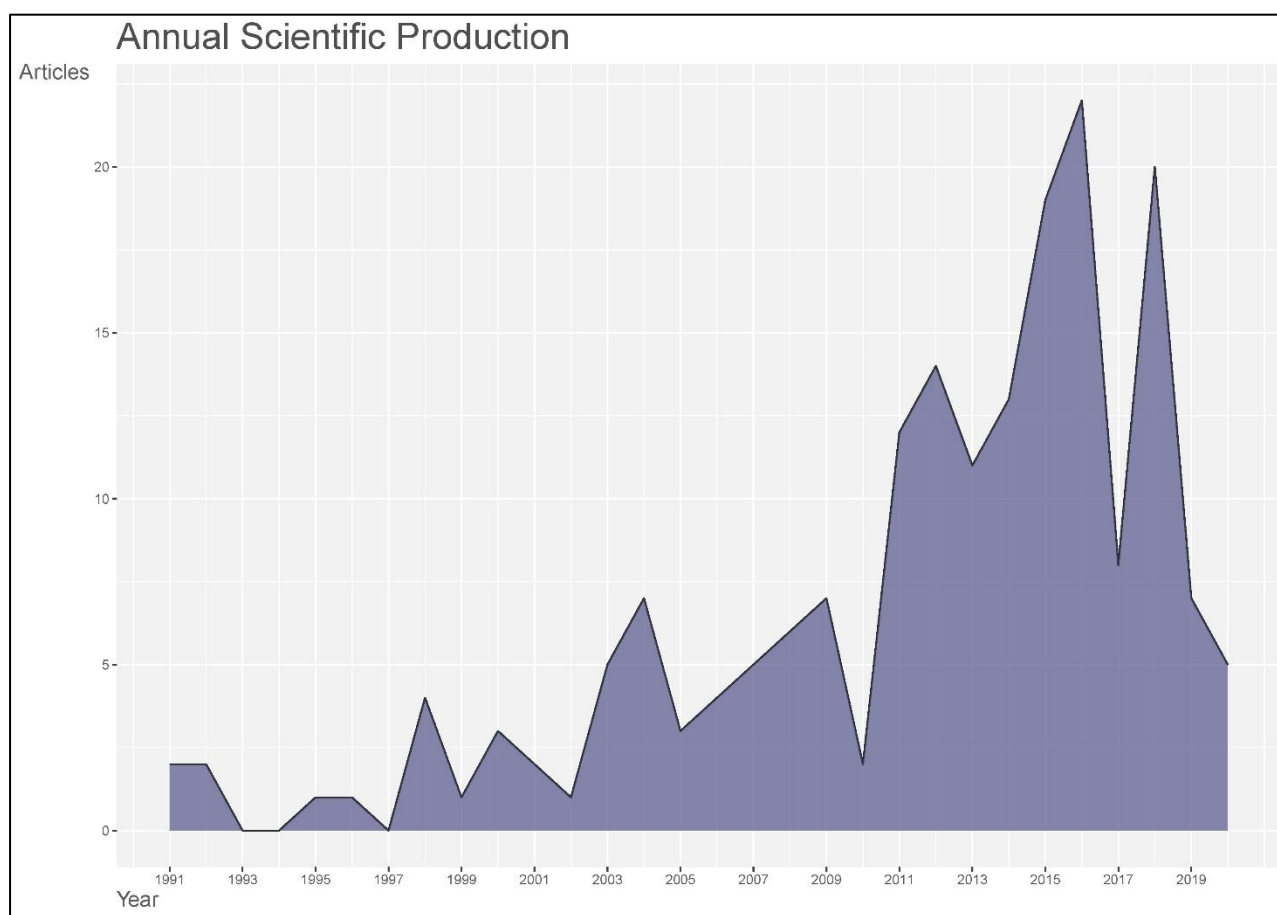
Publication affiliated to Health Sciences University in Central India on Oral Leukoplakia and related conditions were 42. The year wise distribution of these publications is as follows.

Year-wise Number of Publications

1. 2020 [13-15] - 3
2. 2019 [16-29] -14
3. 2018 [30-42] - 13
4. 2017 [43-54] - 12

Discussion:

Out of total 188 Publications, highest number of document type was Journal Article (Total-136) followed by Review Article (Total-34). Among the list of Corresponding Authors, 160 Authors were from India. Corresponding Authors from other countries included authors from US, France, Australia, Germany, Belgium, Brazil, Canada, Jamaica and Kuwait.

Average citations per document were 14.7. No. of authors were 798. Authors of single-authored documents were 8 and authors of multi-authored documents were 790. Authors per Document were 4.24 and Co-Authors per document were 5. Collaboration Index was 4.39. Annual Percentage Growth Rate of publications was 3.21. Citations graph displays a steady growth of citations till date indicating that the scientific literature and their citations are on rise over last 5 years.

Oral leukoplakia (OL) is the most widely recognized possibly harmful sore of the oral mucosa, with an expected frequency of 2% in general Population. The yearly frequency of change into oral squamous cell carcinoma (OSCC) is assessed to be 1% for a wide range of OL.

The prevalence of OL is purportedly higher in males between the fourth and seventh decade of life (55) In etiological terms, leukoplakia is isolated into two gatherings: (a) idiopathic leukoplakia, in which no causal variables have been set up; and (b) smoking-related leukoplakia (56).Undoubtedly, smoking is the fundamental set up causal factor basic these possibly threatening sores (57). A synergic impact has likewise been accounted for among liquor and smoking comparable to the development of leukoplakia and oral malignant growth (58).

Other aetiological factors described are Synginaria canadensis found in toothpastes and oral peels, Candida, human papillomavirus (HPV) and infectious agents such as bacteria, nutritional and socio-economic factors, and many systemic disorders(59).

Most o the patients with Leukoplakia are usually unaware of the presence of these lesions in the oral cavity. The main reasons for going to a specialist for examination, we found that the majority of patients (79.4%) were referred by a healthcare professional, demonstrating the importance of a doctor or dentist in establishing a diagnosis of the disease. OL is usually asymptomatic and there is evidence that the development of pain and discomfort may be associated with the presence of malignant changes(60)

Homogenous Type is the most common variey of Clinical leukoplakia (81.6%) and 18.4% with non-homogeneous lesions. Histologically, most of the OL lesions showed no epithelial dysplasia (65.7%) Among the lesions exhibiting dysplasia, mild dysplasia usually predominate (23.8%).

Currently, there is no consensus on the best treatment strategy for OL patients(61). The main purpose is to avoid incurable changes, although difficult to manage, because most wounds are resistant to healing and have a high recurrence rate(62).

To date, a completely reliable personal predictor of fatal change has not been established (63). In the literature it was reported that non-homogeneous lesions had an increased risk of malignancy(64).

Bronze and Van der Val (65) did not find the location of the injury as a sign of Malignancy risk, but still lesions on the tongue were found to be considerably allied to malignization,

The presence and severity of epithelial dysplasia is one of the most important predictors of malignant transformation in OL(66).

Conclusion:

Scientific Productions on Leukoplakia from Central India as a special entity are on rise over a period of last 10 years. Researchers are more focussed on searching the rate of progression of leukoplakia and effectiveness of early diagnosis and treatment on the progress of leukoplakia to well-developed squamous cell carcinoma.

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