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## Management of Oral-Leukoplakia with Topical Spirulina: A Case Report.

Corlson Titus Paul S\*, Amudhan, and Nalini Aswath.

Department Of Oral Medicine & Radiology, Sree Balaji Dental College & Hospital, Bharath University, Chennai, Tamil Nadu, India.

### ABSTRACT

Oral leukoplakia is one among the most common potentially malignant lesions reported in the oral cavity. Topical Spirulina has been used in management of oral leukoplakia. Spirulina is a Blue green filamentous algae (*Spirulina plantensis*) *S. plantensis* potentiates the immune system leading to suppression of cancer development and viral infection. In this article an attempt has been made to treat two cases of oral leukoplakia with topical application of Spirulina.

**Keywords:** leukoplakia, Spirulina

\*Corresponding author

## INTRODUCTION

Oral leukoplakia (OL) is a premalignant lesion described as “a predominant white lesion of the oral mucosa which cannot be defined as any other known lesion”<sup>1</sup>. Potentially malignant disorders of the oral cavity can be broadly classified into precancerous lesions and precancerous conditions. The early intervention of potentially malignant lesions wherever possible is to prevent malignant transformation<sup>2</sup>.

OL prevalence in the general population varies from less than 1 to more than 5 percent<sup>3</sup>. Oral leukoplakia is a commonly seen premalignant lesion with varied clinical presentation. Most commonly it appears as a white patch anywhere in the oral cavity. Its global prevalence varies from 0.5 to 3.4% and malignant transformation ranges between 0.17 to 17.5%<sup>4,5</sup>.

The Role of spirulina which is an antioxidant has not been well documented for the treatment of Oral leukoplakia. Topical application of spirulina, a blue green algae which is rich in carotenoids and other micronutrients have chemo preventive potential and can be used to treat the oral precancerous lesions like leukoplakia<sup>3,6</sup>. Therefore, this study was undertaken to evaluate the efficacy of Spirulina as a topical application in the management of Oral leukoplakia

## MATERIALS AND METHODS

Patient with evident leukoplakic changes are subjected to toluidine blue stain. If the lesion is positive for vital staining then they are excluded from the study as there are more chances for the lesion to be dysplastic. If the lesion doesn't take up the stain then they are included for the study. Patients with any systemic disorders and on any other medications or therapy were excluded from the study. Initially patient is counselled and advised to quit habits before starting the treatment.

Spirulina capsule is broken and the powder is topically applied to the lesion. Patient is instructed not to eat or drink for 45 minutes. This is repeated 4 times a day till the lesion regresses.

### Case Report 1:

A male patient, aged 41 years reported to the department of Oral Medicine and Radiology with a chief complaint of a white patch on the left side of the buccal mucosa, measuring 2.5x2.5cm approximately and was non-scrapable. No relevant past medical and dental history. Patient had the habit of smoking cigarette for the past 20 years/5 cigarettes per day. He quit the habit since 3 months. He was subjected to the above mentioned treatment protocol [Fig 1a].



After 40 days of follow up complete regression of lesion could be appreciated. [Fig 1b]



**Case Report 2:**

A male patient, aged 52years reported to the department of Oral Medicine and Radiology with a chief complaint of a reddish white patch in right commissure of lip, measuring approx 1x1cm in size approximately and that was non-scrapable. No relevant past medical and dental history. Smokes cigarette for the past 40 years/7 times per day. He quit the habit since 2 months. He was subjected to above mentioned treatment protocol.

[Fig 2a].



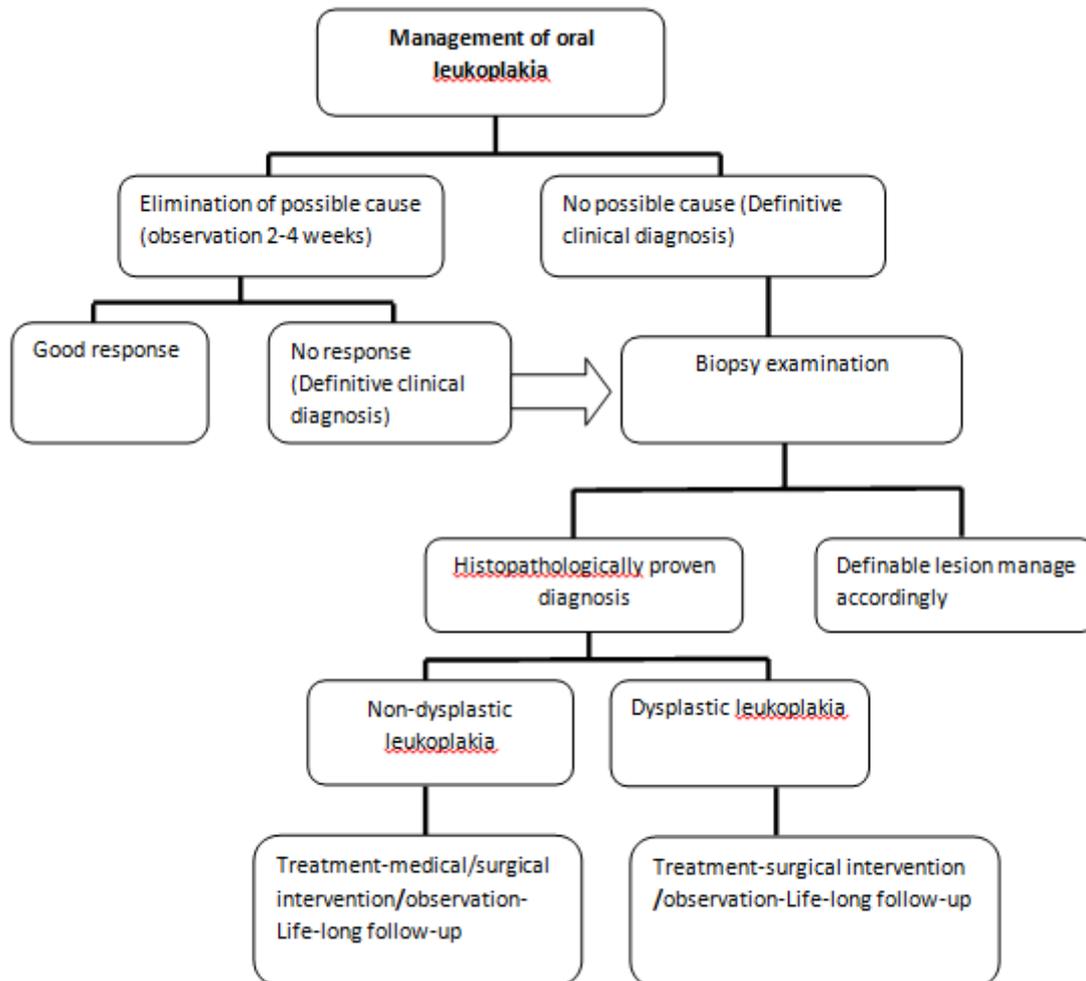
After 40days of follow up complete regression of lesion could be appreciated .[Fig 2b]



DISCUSSION

**Oral leukoplakia**

Much of the published data on the prevalence of potentially malignant disorders varies by the geographical location and population studied. Estimates of the global prevalence of oral leukoplakia range from 0.5 to 3.4%. The point prevalence is estimated to be 2.6% (95% CI 1.72–2.74) with a reported malignant transformation rate that ranges from 0.13 to 17.5%. Prevalence increases with advancing age; it is less than 1% in men younger than 30 years, but 8% in men and 2% in women over 70 years. Smoking is the most commonly associated aetiological factor but there are other possible factors such as alcohol, HPV infection, candidiasis, and reduced concentrations of serum vitamin A and beta-carotene<sup>2</sup>.



**Spirulina:**

Spirulina- Blue green filamentous algae *Spirulina plantensis* modulation of the host immune system potentiates the immune system leading to suppression of cancer development and viral infection. It contains high-quality protein, vitamins, minerals, essential fatty acids, phenolic acid, tocopherols, and beta-carotene which are known to exhibit antioxidant properties<sup>9</sup>.

Spirulina acts by effectively quenching the hazardous free radical, which initiates carcinogenesis. It has an immunoregulating property that might retard the development of cancer cells, increases the number of circulating lymphocytes. It enhances proliferation and induction of cytotoxic T lymphocytes. It increases Helper T cells & TNF. The chemopreventive capacity to reverse precancerous lesions<sup>10</sup>

Spirulina contains its own anti-oxidants like beta-carotene, superoxide dismutase, selenium and vitamin E. Antioxidants helps to protect the body against free radicals formed due to stress, exposure to toxic chemicals, drugs and poor diets. Free radicals can lead to degenerative disease like cancer, aging, age related macular degeneration etc., Studies have revealed that antioxidants in fruits and vegetables and Spirulina have a synergistic effect<sup>11,12</sup>.

### CONCLUSION

Oral antioxidant spirulina can be used as an adjuvant therapy in the initial management of leukoplakia patients and was well tolerated by oral leukoplakia patients without any side effects as reported by the patients in this study. Larger number of patient's sample, with longer period of treatment follow-up, is required to draw further conclusion on the utility of spirulina in the treatment of oral leukoplakia<sup>14,15</sup>.

### REFERENCES

- [1] Adriana Spinola Ribeiro, Patrícia Ribeiro Salles, Tarcília Aparecida da Silva, and Ricardo Alves Mesquita -A Review of the Nonsurgical Treatment of Oral Leukoplakia INTERNATIONAL JOURNAL OF DENTISTRY, January 2010; vol (2010) :1-10.
- [2] Anand Kumar a, Luke Cascarini a, James A. McCaul b, Cyrus J. Kerawala c, Darryl Coombes d, Daryl Godden e, Peter A. Brennan f. How should we manage oral leukoplakia? BJOMS, 2013;51(2013):377–383
- [3] T. Manigandan\* And V. T. Hemalatha. Insight Of Various Medical Management Of Oral Leukoplakia, BIOMED. & PHARMACOL. J., Oct. 2015; Vol. 8(Spl. Edn.): 393-401
- [4] Tatu R, Shah K, Palan S, Brahmakshatriy H, Patel R. Laser Excision Of Labial Leukoplakia With Diode Laser: A Case Report , IJRRMS, oct - dec 2013 ;VOL-3(4) : 64-66
- [5] Yadav Monu, Bashir Taseer, Chandel Shipli, Krishnan Vijay, Ahmad Naeem, Pankaj. Review Article- Leukoplakia: A Mysterious White Patch, JMSCR September 2014; Volume 2( 9) : 1824-1830
- [6] Prathima Shetty, Prashanth Shenai, Laxmikanth Chatra, Prasanna Kumar Rao . Efficacy Of Spirulina As An Antioxidant Adjuvant To Corticosteroid Injection In Management Of Oral Submucous Fibrosis , IJDR 2013; 24(3):347-350
- [7] Bhavana Sujana Mulk, Prasannasrinivas Deshpande, Nagalakshmi Velpula, Vani Chappidi, Raja Lakshmi Chintamaneni, Stuti Goyal .Spirulina And Pentoxifylline – A Novel Approach For Treatment Of Oral Submucous Fibrosis- JCDR, 2013 Dec; Vol-7(12): 3048-3050
- [8] Toludine Blue-A Review With A Case Report, Manigandan T, Kishorekumar S, Nithya J, Kavitha N, Kirthuika K. RJPBCS, Mar-Apr 2014;5 (2) : 1894-99
- [9] P. K. Srivastava And A. K. Pandey. Natural Products And Derivatives: Biological And Pharmacological Activities. BIOCHEM. CELL. ARCH, 2015; Vol. 15(1): 1-38.
- [10] Ashish Aggarwal, Arvind Shetti, Vaishali Keluskar, And Anjana Bagewadi Estimation Of Serum Beta Carotene Levels In Patients With Oral Submucous Fibrosis In India JOURNAL OF ORAL SCIENCE, 2011; Vol. 53(4): 427-431
- [11] Thrivrn R, Praveen Ah, Mebeen. Effects Of Natural Beta-Carotene And Commercially Available Complination Of Beta-Carotene, Vitamin E, Vitamin C And Minerals: A Prospective Comparatie Study, JIAOMR, 2011; 23(4):554-58
- [12] Rakhi Issrani, Namdeo Prabhu, Vaishali Keluskar, Oral Proliferative Verrucous Leukoplakia: A Case Report With Am Update, CONTEMPORARY CLINICAL DENTISTRY April-June 2013; Vol 4(2) : 258-262
- [13] Evgeniy Mironov, Dds, Zhasmina Mironova, Dds. Clinical Bulletin Leukoplakia Case Report, J. LA & HA; vol 2013(1):CB01.
- [14] The Technical Support Team Parry Nutraceuticals, Divn Of E.I.D. Parry (India) Ltd., Health Benefits Of Spirulina, HACCP AND CGMP CERTIFIED PRODUCTION FACILITY:(1-23)