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Potency and Accuracy of Spirulina in the treatment of Oral Leukoplakia

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Abstract

Introduction: Leukoplakia is one of the most common potentially malignant disorders of the oral cavity. Malignant transformation of oral leukoplakia in annual average is 1% in different populations and geographic areas with the higher risk reported by 43%.The pooled estimated prevalence rate of oral leukoplakia in 2003 varied between 1.7 to 2.7% in general population. It has been reported that about 16% and 62% of oral squamous carcinomas are associated with oral leukoplakia.

Aim: To evaluvate the potency and accuracy of Spirulina in the treatment of Oral leukoplakia

Material and method: In this study we included 20 patient age between 20-40 year male and female both clinically diagnosed with leukoplakia to spirulina 500mg tab bd for a period of three months .all the patients are instructed to take spirulina regularly. at each visit parameters like relief in extension and size of the lesion and symptoms and there is no side effects of spirulina.

Results: at the end of three months, there was decrease the values extension and size of the lesion and symptoms of Leukoplakia

Conclusion: spirulina 500mg tab bd for a period of three months. It improve extension and size of the lesion and symptoms of Leukoplakia

Keyword: spirulina ,pre-malignant lesion, size of the lesion ,Oral Squqmous cell carcinomas.

Introduction

Leukoplakia is one of the most common potentially malignant disorders of the oral cavity[4]. Malignant transformation of oral leukoplakia in annual average is 1% in different populations and geographic areas with the higher risk reported by 43%.The pooled estimated prevalence rate of oral leukoplakia in 2003 varied between 1.7 to 2.7% in general population. It has been reported that about 16% and 62% of oral squamous carcinomas are associated with oral leukoplakia.[1]

In 2012 Van der Wall proposed a new definition -

"A predominantly white lesion or plaque of questionable behavior having excluded, clinically and histopathologically, any other definable white disease or disorder."

The white appearance of all of these lesions is the combined effects of increased surface keratin production, thickened epithelial layers and resultant obscured sub-epithelial vascularity.

Leukoplakia has been recognized by two forms: Homogeneous and the Non-homogeneous type[2].

Homogeneous leukoplakia has predominantly white lesion of uniform flat, thin appearance, smooth, wrinkled or corrugated surface throughout the lesion, whereas non-homogeneous leukoplakia has been a mixture of white-and-red lesion that may be either irregularly flat, nodular, or verrucous[1,5].

Oral Leukoplakia is diagnosed on the basis of clinical criteria including extent and size of the lesion and symptoms. the treatment of oral leukoplakia postulates a major challenge for oral physicians.there are various advancements in treatment modalities.oral leukoplakia till date remains a disorder that causes irreversible and irreparable damage to the tissues.thus the aim of this study to relieving the patient from various symptom of extent and size of the lesion. the treatment modalities have been tried to relieve these symptoms. It has been tried by both surgical and non surgical approach.[3] .

Current medical treatment modalities include the use of micro-nutrients and minerals (Vitamin A, B complex, C, D, E, iron, copper, calcium, zinc, magnesium selenium etc.), lycopene, turmeric, interferon, steroids, placental extracts and physiotherapy. But each one has its own limitations[4]..

Aim

The aim of the present study was determined the potency and accuracy of spirulina in teratment of oral Leukoplakia.

Selection Criteria

Inclusion criteria

- Age: 20-60 years.
- Patient clinically diagnosed with pre-cancerous lesion.

Exclusion criteria

- Age: <20 yrs, >60 yrs
- Patient with chronic illness and systemic disease which are likely to alter the mucosa histopathologically.
- Pregnancy and lactating mother.

Material and Methods

Study design: The randomised clinical study was conducted in the Department of Oral madicine and radiology career dental college lucknow,Uttar

pradesh,india from June 2017 to sep 2019.the parameters are based on the clinical bases .Thus the study included 20 patients with clinically diagnosed by oral leukoplakia. There are inclusion or exclusion criteria of this study mention in selection criteria earlier and their is no side effects of spirulina..prior to the study ,an informd written consent was requested from every participent.After the consent we taken the case history and patient divided (According to Ongole 12th edition) classificaton which are as followed[8].

Leukoplakia – leukoplakia was diagnosed according to its size, shape, appearance.

Classification of lesion (According to Ongole 12th edition)

L1: size if single or multiple leukoplakia together <2 cm

L2: size if single or multiple leukoplakia together 2-4 cm

L3: size if single or multiple leukoplakia together >4 cm,

Lx: size not specified.

Treatment Modalities

The patient were given**:-** spirulina 500mg tab bd for a period of three months improvement in extent and size of lesion and symptoms [.20 patient adge between (20 – 60 year both sex) .All the patient were instructed to take spirulina regularly at home.

Assessment for Potency of Treatment

At each follow up visit improvement in extent and size of lesion and symptoms was measured and recorded in proforma.

Assessment For Accuracy

Careful monitoring of patient was done by invastigator during and after given the spirulina 500mg tab and proper investigate each and every step following the treatment and seen the any improvement in extent and size of the lesion and symptoms and any side effect due to the drug if the any side effect were noted in the proforma and appropriate treatment given.

Statistical analysis

Continuous data were summarised as Mean ± SE (standard error of the mean) whereas discrete (categorical) in number (n) and percentage (%). Pre and post groups were compared by paired t test. Categorical groups were compared by chi-square (χ^2) test. A two-tailed (α=2) $p<0.05$ was considered statistically significant. Analyses were performed on SPSS software (Windows version 17.0).

Results and Observations

The present study evaluates efficacy of spirulina in treatment of oral leukoplakia. Total 20 patient of oral leukoplakia, were recruited. The outcome measures of the study were lesion size and extend (leukoplakia),

The outcome measures were assessed at pre treatment (pre) and 3 month post treatment (post). The outcome measure viz. lesion size was measured in grade (L1, L2, L3 and Lx) and millimetre (mm). The outcome measures viz. lesion size was measured in centimetre (cm).

The objective of study was to evaluate the efficacy of spirulina in improvement of clinical symptoms extent and size of lesion of Leukoplakia.

Demographic characteristics

The demographic (age and sex) characteristics of leukoplakia (n=20), patients is summarised in table 1 and also depicted in Fig. 1 to 3, respectively. The age of leukoplakia patients ranged from 22 to 45 yrs with mean (± SE) 31.15 ± 1.29 yrs and median 32 yrs. Of total, 9 (35.0%) patients were ≤ 30 yrs aged and 11 (65.0%) were >30 yrs aged. Further, among patients, there were 8 (30.0%) females and 12 (70.0%) males.

Table 1: Demographic characteristics of three groups

Demographic characteristics	No of patients (n=20) (%)
Leukoplakia	
Age:	
≤30 yrs	9 (35.0)
>30 yrs	11 (65.0)
Sex:	
Female	8 (30.0)
Male	12 (70.0)

Age and sex were summarised in number (n) and percentage (%).

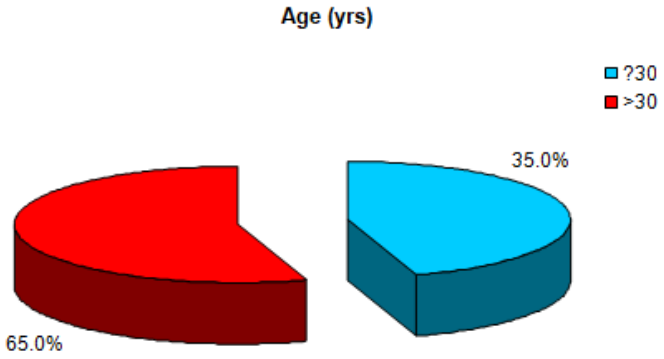

Fig. 1: Distribution of age of leukoplakia patients

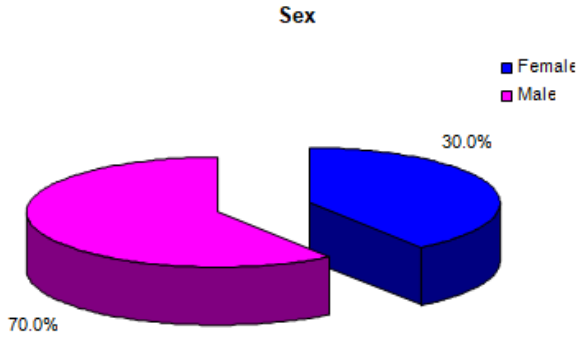

Fig. 2: Distribution of sex of leukoplakia patients

Outcome measures

A. Leukoplakia

Lesion size

The pre and post lesion size (L1/L2/L3/Lx) of leukoplakia patients is summarised in Table 2 and also depicted in Fig. 3. At pre, the lesion size of 2 (10.0%) patients was L2, 9 (45.0%) was L3 and 9 (45.0%) was Lx whereas at post, it was 19 (95.0%) L1 and 1 (5.0%) L2.

Comparing the pre and post lesion size (grade), χ^2 test showed significant reduction or improvement in lesion size at post as compared to pre (χ^2=37.33, p<0.001) (Table 2 and Fig. 7).

Table 2: Pre and post lesion size of leukoplakia patients

Lesion size	Pre (n=20) (%)	Post (n=20) (%)	χ^2 value	p value
Grade:				
L1	0 (0.0)	19 (95.0)	37.33	<0.001
L2	2 (10.0)	1 (5.0)		
L3	9 (45.0)	0 (0.0)		
Lx	9 (45.0)	0 90.0)		

L1: size if single or multiple leukoplakia together <2 cm, **L2:** size if single or multiple leukoplakia together 2-4 cm, **L3:** size if single or multiple leukoplakia together >4 cm, **Lx:** size not specified. Pre and post lesion size were summarised in number (n) and percentage (%) and compared by χ^2 test.

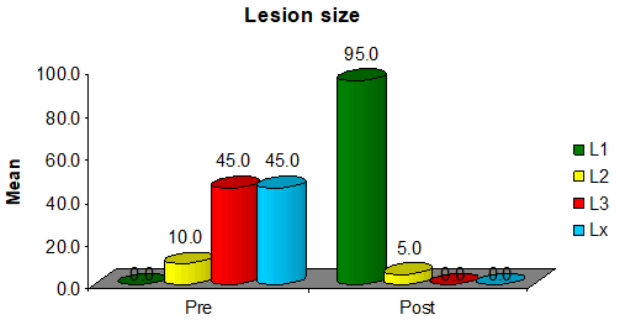

Fig. 3: Distribution of pre and post lesion size of leukoplakia patients

Discussion

In this study, we tried to investigate the potency and accuracy of Spirulina in tratment of Oral leukoplakia. Oral leukoplakia is a complex precancerous condition of oral cavity. It is considered as major oral health problem

with high degree of malignant potential[6]. Lack of a specific treatment modality pose a greater challenge in treating this condition. Spirulina is a one of them. Spirulina is blue green algae with rich natural source of proteins, carotenoids and other micronutrients[9]. It has been primarily assessed in treating leukoplakia with promising results. The chemopreventive capacity to reverse precancerous lesions of spirulina is attributed to the antioxidant property with high amount of beta carotene and superoxide dismutase. The present study is the first of its kind in which spirulina has been tried in oral leukoplakia[10]. Highly significant results were obtained with all three parameters extension and size of the lesion symptoms. When efficacy of Spirulina, statistically insignificant results were found for 3 month extension and size of the lesion and symptoms[7]

. However the difference for extention and size of the lesion was statistically significant. Spirulina performed better with patient showing more satisfaction as the subjective symptom was reduced. It also showed no side effects which was similar to the study by Mathew et al[11,12]. Spirulina has emerged as the wonder food supplement. Several leading organizations are utilizing this beneficial action[10]. Very few adverse effects have been reported with the use of spirulina which include headache, muscle pain, flushing of the face, sweating,and difficulty in concentrating. Skin reactions have also been reported in some individuals, there are various study has been tried in the management of oral leukoplakia[14]. The potential health benefits of spirulina must be adequately recognized and implemented thus making full use of this nature's gift Conventional therapies include corticosteroids, placental extracts, laser and surgery][15] . The effect of spirulina in 20 oral leukoplakia patient. Patient relief extension and size of the lesion and improve symptoms also. However Spirulina are found to be effective in the management of Oral leukoplakia

Limitation

In this study we propose spirulina as an efficacious cost effective and safe drug for recalcitrent cases of Oral leukoplakia ,and the two major limitation less number of patient and lack of histopathologic confirmation.

Conclusion

spirulina given the promising results .it relief extent and size of lesion and symptoms also .potency and accuracy of Spirulina gives satisfactory results in leukoplakia patients,

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