

Evaluation of Cachexia in Oral Submucous Fibrosis

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ABSTRACT

Introduction: Patients with cancer suffer from a wasting syndrome associated with anorexia/cachexia. Anorexia is associated with a marked loss of appetite and/or an aversion to food. Cachexia is associated with loss of body mass and is often associated with weakness, fatigue leading to poor quality of life. It has been observed in those individuals with oral submucous fibrosis (OSMF), a premalignant condition, are generally thin and there seems to be a relation between loss of appetite and consumption of areca nut in these individuals.

Aims: Evaluation of cachexia in OSMF patients based on the criteria given for defining cachexia by group of scientists and clinicians in the cachexia consensus conference.

Materials and methods: Twenty OSMF cases (group I) and 20 healthy individuals with areca nut chewing habit (group II) were assessed for body mass index (BMI), hemoglobin and serum albumin level. Their fatigue and anorexia scores were calculated by using structured questionnaires.

Results: Correlation between fatigue and anorexia was statistically significant for OSMF group but was statistically not significant in group II. Comparisons of BMI, hemoglobin, fatigue and anorexia between two groups were statistically not significant, however, serum albumin was found to be statistically significant.

Conclusion: From the present study it can be concluded that the early process of cachexia begins during the progression of OSMF. The areca nut chewing practice associated with OSMF may play some role in this context.

Keywords: Oral submucous fibrosis, Cachexia, Serum albumin, Anorexia, Fatigue.

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INTRODUCTION

Cachexia is a complex interplay of metabolic and behavioral variables leading to continuous deterioration of health and compromised quality of life. The word 'cachexia' is derived from the Greek 'kakos' meaning 'bad' and 'hexis' meaning 'condition'. Cachexia is a debilitating state of involuntary weight loss complicating malignant, infectious and inflammatory diseases and contributing significantly to mortality. Anorexia, also a frequent complication of these diseases, is a major contributor to the development of cachexia, although the pattern of weight loss in cachexia differs from that seen with pure nutrient deprivation.¹

Cachexia is infrequently identified or diagnosed and rarely treated and there is no universally agreed upon definition. It was essential to have a specific definition so that clinicians can recognize the problem and institute corrective measures to treat it. In 2006, scientists and clinicians met in Washington DC, to reach a consensus on the definition of the constellation of abnormalities that have been grouped under the name cachexia. The criteria were: Weight loss of at least 5% in 12 months or less (or BMI <20 kg/m²) along with three of the any five mentioned criteria, i.e.

1. Decreased muscle strength,
2. Fatigue,
3. Anorexia,
4. Low fat-free mass index, and
5. Abnormal biochemistry [e.g. increased inflammatory markers C-reactive protein (>5.0 mg/l, II-6 > 4.0 pg/ml), anemia (<12 g/dl), low serum albumin (<3.2 g/dl)].²

Oral submucous fibrosis (OSMF) is a chronic, insidious disease caused by areca nut use, and is associated with both significant morbidity (including pain and reduced oral opening) and an increased risk for malignancy.³ It has been observed that areca nut constituents modulate metabolic signals that regulate appetite in man.⁴ Anecdotal evidence suggests that use of the areca nut may reduce appetite, and therefore influence body weight and fatness. There is as yet no quantitative evidence for such effects of areca chewing. However, the wider literature on populations exposed to periodic food shortages contains numerous generalizations about the use of the areca nut to suppress hunger.⁴ Further, it has been found that areca nut chewing practices result in energizing, relaxing and soothing effect⁵ and help to counteract fatigue.⁶

In the view this background, our paper reports a study intended to test the hypothesis that areca chewing is associated with moderation of appetite and alleviation fatigue and whether it may lead to the development of cachexia in OSMF patients.

MATERIALS AND METHODS

The study included 20 OSMF cases (group I) and 20 individuals with areca nut chewing habit but without any lesion (group II) within the age range of 20 to 47 years. Out of 20 cases in group I, 16 were males and 4 were females, among which eight were presenting grade III OSMF while 12 were having grade II OSMF. In group II, six females

and 14 males were included (Table 1). Both the groups were assessed for BMI, hemoglobin and serum albumin level. Simplified nutritional assessment questionnaire (SNAQ) was used for evaluation of anorexia.⁷ The fatigue questionnaire was formulated using the guidelines given evaluation of fatigue by Portenoy et al.⁸

STATISTICAL ANALYSIS

Mean and standard deviation were calculated for age, BMI, hemoglobin%, serum albumin level, fatigue and anorexia in both the groups. All these parameters were compared by using Student's t-test. Pearson's correlation was performed between anorexia score and fatigue score in both the groups.

RESULTS

Comparison of age between groups I and II was not significant statistically. Comparison of BMI, hemoglobin%, serum albumin, anorexia and fatigue between both the groups was found to be statistically not significant. However, comparison of serum albumin between the two groups was found to be statistically significant ($p < 0.01$) (Table 2). Pearson's correlation between fatigue and anorexia within the group I was statistically significant for group I ($p < 0.01$) but was not significant for group II (Table 3).

DISCUSSION

OSMF is a chronic debilitating disease and a potentially malignant disorder of the oral cavity. It is characterized by a generalized submucosal fibrosis.⁹ The available literature indicates that the main etiological factors for OSMF are the constituents of areca nut, mainly arecoline, while tannin may have a synergistic role.¹⁰ The betel nut has psychotropic and antihelminthic property due to presence of areca alkaloids. Four alkaloids have been conclusively identified in biochemical studies, i.e. arecoline, arecaine, guvacine and guvacoline. These alkaloids have powerful

parasympathetic properties which produce euphoria and counteract fatigue.⁶

Areca nut is the fourth most addictive substance in the world and is associated with a dependency syndrome.³ The evidences from the studies suggest that betel quid chewing reduces appetite by suppressing hunger during work hours or until it is convenient to eat.⁵ Sullivan et al found that nut was chewed for energy or to prevent fatigue, rather than for its psychotropic effects.¹¹ Thus, areca nut chewing is mainly practiced to reduce hunger and getting reenergized.

There are numerous studies on evaluation of cachexia in cancers of various organs and body parts. This study, however, is first of the kind and is an attempt to evaluate cachexia in OSMF patients as this premalignant condition is very rampant in South East Asia and exhibits malignant transformation rate of 7 to 13%.⁹ There is a possibility that the markers of cachexia are well-formed during the progression of OSMF and further contribute to malignant transformation of this entity.

Many of the OSMF patients present with anemia and nutritional deficiencies but it is not clear how these conditions are related to OSMF.³ The hemoglobin level was statistically not significant in the present study indicating that OSMF patients were not anemic. Comparison of mean BMI of both the groups was statistically not significant and indicates the absence of weight loss in OSMF patients.

In the present study, there is significant decrease in the serum albumin levels in OSMF group. It has been postulated that areca nut may induce the development of the disease by increased levels of cytokines in the lamina propria¹⁰ and it has been found that cytokines lower the serum albumin concentration.¹² Thus, release of cytokines during OSMF progression may affect the serum albumin levels.

Literature suggests that usage of areca nut suppresses hunger and counteracts of fatigue.^{5,6} However, the significant correlation between anorexia and fatigue in group I indicate that the anorexia has increased the level fatigue in OSMF individuals. Yet it cannot be concluded

Table 1: Total number and sex distribution in the groups

Parameter	Males	Females	Total
Group I	16	4	20
Group II	14	6	20

Table 3: Mean and standard deviations of anorexia and fatigue

Parameters	Fatigue	Anorexia	p-value
Group I	21 ± 6.01	11 ± 2.8	<0.01
Group II	11.9 ± 1.3	5.5 ± 1.1	>0.01

Table 2: Mean and standard deviations of various criteria in both the groups

Parameter	Age (mean ± SD)	BMI (mean ± SD)	Albumin (mean ± SD)	Hb% (mean ± SD)	Fatigue (mean ± SD)	Anorexia (mean ± SD)
Group I	29.4 ± 8.3	20.5 ± 3.2	3.5 ± 0.13	12.7 ± 1.6	21 ± 6.1	11 ± 2.9
Group II	29.1 ± 4.1	21.5 ± 2.3	3.4 ± 3.5	12.8 ± 1.5	11.9 ± 1.3	5.5 ± 1.1
p-value	0.80	0.24	0.01	0.90	1.4	3.3

that the areca nut has direct effect on fatigue levels in these individuals.

The merits of the study include significant correlation between anorexia and fatigue; and positive relation between serum albumin levels. However, smaller sample size may be the major factor in determining the influence of other parameters on cachexia in OSMF individuals.

CONCLUSION

Release of cytokines during the progression of OSMF may influence the serum chemistry by lowering serum albumin levels. The constituents of areca nut may play a positive role in moderation of appetite and alleviation of fatigue in these patients. Thus, beginning of early cachectic process during progression of OSMF may be assessed by using these criteria on larger sample size.

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