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Original Research

Assessment of serum beta-2 microglobuin levels in oral leukoplakia patients

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ABSTRACT:

Background: The present study was conducted for evaluating serum beta 2 microglobuin levels in oral leukoplakia patients. **Materials & methods:** A total of 30 oral leukoplakia patients were enrolled. Another set of 30 age and gender-matched healthy subjects were taken as control group. Under aseptic conditions, 5 ml of venous blood was collected from antecubital vein of 60 individuals included in the study. The blood was transferred to sterile, dry vacutainer and was evaluated for assessing the serum beta 2 microglobuin levels using auto-analyser. All the results were recorded and analysed using SPSS software. **Results:** Mean serum beta 2 microglobuin levels among patients with oral leukoplakia and healthy controls was 1.56 mg/L and 0.84 mg/L respectively. While comparing the mean serum microglobuin levels among controls and oral leukoplakia patients, significant results were obtained. **Conclusion:** Identification of tumor biomarkers to assist early diagnosis and monitoring of disease progression may potentially decrease the morbidity associated with oral leukoplakia.

Key word: Beta 2 microglobuin, Oral leukoplakia patients.

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INTRODUCTION

Oral premalignancy is considered as an intermediate stage. It is classified into two broad straplines, premalignant lesions and premalignant conditions. The premalignant lesion is defined as "a morphologically reformed tissue in which oral cancer is more likely to occur than in its seemingly normal counterpart." An example is leukoplakia. A premalignant condition is defined as "a generalized state associated with a significantly increased risk of cancer." An example is oral submucous fibrosis. Recently the World Health Organization (WHO) considered premalignant lesions and conditions under a single group of disorders known as Potentially Malignant Disorders. Oral leukoplakia is a potentially malignant disorder affecting the oral mucosa. It is defined as "essentially an oral mucosal white lesion that cannot be considered as any other definable lesion."[1-3]

Tumor indicators have recently been recognized for the early diagnosis of malignancy. In oral cavity carcinomas, different serum indicators including oncofetal proteins (alpha photo protein CEA), B proteins and enzymes (LDH) have been studied. One of the most significant indicators is β2 microglobulin, a protein with light (low weight) molecules (11,800 kDa). It is found on each surface of cell except for erythrocytes which are considered as a light unchangeable chain of compatible histologic antigens. It is abundant in monocytes and lymphocytes. In the normal physiologic state, some amounts of β2 microglobulin can be secreted to the cell or serum due to the intracellular release and it is often extracted from the blood by kidneys.[4-6] Hence; the present study was conducted for evaluating serum beta 2 microglobuin levels in oral leukoplakia patients.

MATERIALS &METHODS

The present study was conducted for evaluating serum beta 2 microglobuin levels in oral leukoplakia patients reported to the Department of Oral Medicine and Radiology Government Dental College and Hospital Srinagar during time period of (Sep 2020 -July 2021). Inclusion criteria were individuals clinically and histopathologically diagnosed as oral leukoplakia. Exclusion criteria were individuals suffering from any

allergic, inflammatory or systemic diseases. A total of 30 oral leukoplakia patients were enrolled.Another set of 30 age and gender-matched healthy subjects were taken as control group. Under aseptic conditions, 5 ml of venous blood was collected from antecubital vein of 60 individuals included in the study. The blood was transferred to sterile, dry vacutainer and was evaluated for assessing the serum beta 2 microglobuin levels using auto-analyser. All the results were recorded and analysed using SPSS software.

RESULTS

Mean age of the subjects of study group and control group was 45.6 years and 47.3 years respectively. Mean serum beta 2 microglobuin levels among patients with oral leukoplakia and healthy controls was 1.56 mg/L and 0.84 mg/L respectively. While comparing the mean serum microglobuin levels among controls and oral leukoplakia patients, significant results were obtained.

Table 1: Comparison of serum beta 2 microglobuin levels

Group	Mean (mg/L)	SD	p-value
Control	0.84	0.23	0.000*
Oral leukoplakia	1.56	0.85	

*: Significant

DISCUSSION

Oral leukoplakia, being a predominantly white change of the oral mucosa, is the most common potentially (pre)malignant lesion. It is a relatively rare disease with an estimated prevalence of less than 1%. Men and women are more or less equally affected. Oral leukoplakia rarely occurs in the first two decades of life and is much more common in tobacco users than in non-tobacco users. Leukoplakia may occur everywhere in the oral cavity and is often asymptomatic otherwise. The clinical diagnosis is primarily based on visual inspection and manual palpation. There are no other useful diagnostic aids for the clinical diagnosis.[6- 9] Hence; the present study was conducted for evaluating serum beta 2 microglobuin levels in oral leukoplakia patients.

Mean age of the subjects of study group and control group was 45.6 years and 47.3 years respectively. Mean serum beta 2 microglobuin levels among patients with oral leukoplakia and healthy controls was 1.56 mg/L and 0.84 mg/L respectively. In a previous study conducted by Anil et al, authors estimated beta 2-microglobulin in patients with oral leukoplakia, oral submucous fibrosis, and oral cancer. The results were compared with that of an equal number of age- and sex-matched healthy controls. A definite increase in the level of beta 2-microglobulin was observed in patients with oral submucous fibrosis and oral cancer. Though the level of beta 2-microglobulin was found to be high in oral leukoplakia, it was not statistically significant.[10]

While comparing the mean serum microglobuin levels among controls and oral leukoplakia patients, significant results were obtained. Singh AP et al established the role of β2-m as a biochemical parameter for diagnosis and prognosis of oral carcinoma by estimation of serum β2-m levels in potentially malignant lesions, conditions, and oral squamous cell carcinoma. The study was carried out on 48 subjects (16 control, 8 oral submucous fibrosis, 8 oral leukoplakia, and 16 oral squamous cell carcinoma patients of different stages). The mean serum β2-m level in the control group was 1.173 ± 0.059, in potentially malignant lesions/conditions group was 1.688 ± 0.137 and in oral squamous cell carcinoma group was 2.835 ± 0.0313. This progressive increase in serum β2-m level was found to be highly significant. Results of Receiver operating characteristic analysis showed β2-m as a 100% sensitive and specific biomarker for oral squamous cell carcinoma. Their study establishes β2-m as a specific biological tumor marker for diagnostic and prognostic evaluation of oral squamous cell carcinoma.[11] In a previous study conducted by Saddiwal R et al, authors evaluated the prognostic value of β2-m as a biochemical parameter for the diagnosis and prognosis of oral squamous cell carcinoma (SCC). The study included 60 patients (15 oral SCC, 15 leukoplakia, 15 individuals exposed to various carcinogens and without oral cancerous or precancerous lesions, 15 healthy individuals). The levels of β2-m were estimated using chemi-luminescent immunometric assay on Immulite fully automated machine. Results showed that β2-m was increased in individuals exposed to carcinogens without precancerous and cancerous lesion. Serum β2-m can be used as a better indicator and can give an early indication of malignant change and therefore malignancy can be detected at an early and treatable stage.[12]

CONCLUSION

Identification of tumor biomarkers to assist early diagnosis and monitoring of disease progression may potentially decrease the morbidity associated with oral leukoplakia.

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