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A COMPREHENSIVE STUDY ON CORRELATION OF SMOKING AND SURVIVIN IN ORAL SUBMUCOUS CARCINOMA

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Abstract:

Introduction: *Oral sub mucous fibrosis (OSF) is a premalignant disorder associated with the chewing of areca nut. After transformation into squamous cell carcinoma (SCC), it is also responsible for mortality. The combination of areca nut and tobacco has led to a sharp increase in the frequency of OSF.* ***Aims and objectives:*** *The basic aim of the study is to find the correlation of smoking and survivin in oral sub mucous carcinoma in local population of Lahore.* ***Material and methods:*** *This study was conducted at Punjab dental hospital, Lahore during 2018. The data were collected from 100 patients of both genders. Tumors, OSF and healthy mucosa were taken at the time of surgical resection. Punch biopsy was performed under local anesthesia, and the sample size measuring 5mm was taken from the affected buccal mucosa. After 24 hours, specimens were fixed in 4% buffered formalin solution. Three sections each of 3 to 4 microns thickness were cut from each selected block using a rotary microtome. Two respective slides were made from one tissue specimen.* ***Results:*** *In a study to detect survivin levels in saliva in patients with OSCC by using a specific ELISA test it was found that the survivin levels in patients with OSCC are significantly higher than those of healthy subjects and the difference in survivin levels between early stages of OSCC and control subjects were found to be significant. Chi square test was applied to calculate level of significance with respect to duration of smoking and insignificant results were obtained.* ***Conclusion:*** *It is concluded that survivin in oral premalignant lesions can be a marker for progression to malignancy. Survivin in oral premalignant lesions can be a marker for progression to malignancy.*

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INTRODUCTION:

Oral submucous fibrosis (OSF) is a premalignant disorder associated with the chewing of areca nut (betel nut). The habit is prevalent in South Asian populations but has been recognized nowadays also in Europe and North America. OSF causes significant morbidity. After transformation into squamous cell carcinoma (SCC), it is also responsible for mortality. The combination of areca nut and tobacco has led to a sharp increase in the frequency of OSF [1].

The most obvious changes occur in the extracellular matrix of the submucous tissue layer. Fibrosis is associated with quantitative and qualitative alterations of collagen deposition within the subepithelial layer of the oral mucosa [2]. This is partly due to marked deficiencies in collagen and fibronectin phagocytosis by fibroblasts caused by betel nut alkaloids (arecoline, arecaidine).

Survivin has been found as a good prognostic marker in Oral squamous cell carcinoma. Survivin is a recently characterised IAP protein, which is expressed in most solid and haematological malignancies and the gene encoding human survivin was cloned by Ambrosini et al. in 1997 [3]. Survivin is not produced in adult tissues except for the thymus, placenta, basal colonic epithelium, endothelial cells and neural stem cells. In OSCC conventional prognostic factors such as clinical stage, tumor size, lymphnode metastasis are not always accurate. Thus there is a need for additional factors including molecular markers for early detection and to explain the mechanism of development and recurrence in OSCC [4]. Survivin expression can be used to predict the prognosis of cancer, since its expression is increased in malignant neoplasms. Various pre - clinical trials have shown its resistance to anti-cancer drugs and ionizing radiations given to the patient. Survivin is weakly expressed in the areas where there is increase in apoptosis, radiations given to cancerous tissues, and sensitized neoplastic cells to chemotherapy [5]. Survivin expression is lowered in normal tissues and characterizes by self-renewal and proliferation. Research revealed intense expression of survivin in solid neoplasms and blood cancers [6].

Aims and objectives

The basic aim of the study is to find the correlation of smoking and survivin in oral submucous carcinoma in local population of Lahore.

MATERIAL AND METHODS:

This study was conducted at Punjab dental hospital, Lahore during 2018. The data were collected from 100 patients of both genders. Tumors, OSF and healthy mucosa were taken at the time of surgical resection. Punch biopsy was performed under local anesthesia, and the sample size measuring 5mm was taken from the affected buccal mucosa. After 24 hours, specimens were fixed in 4% buffered formalin solution. Three sections each of 3 to 4 microns thickness were cut from each selected block using a rotary microtome. Two respective slides were made from one tissue specimen.

RESULTS:

Survivin as Diagnostic Marker

In a study to detect survivin levels in saliva in patients with OSCC by using a specific ELISA test it was found that the survivin levels in patients with OSCC are significantly higher than those of healthy subjects and the difference in survivin levels between early stages of OSCC and control subjects were found to be significant [7]. Antisurvivin was associated with tumor aggressiveness, indicating that the serum autoantibody may represent cellular status. Detection of circulatin anti-survivin autoantibody could potentially serve as a useful noninvasive marker for determining head-and neck cancer status. In a study using r-survivin protein as the antigen, it was found to be may be useful for screening of healthy individuals or patients with head-and-neck cancer and to monitor the development of survivin autoantibody during Oncogenesis.

Role of survivin in cancer treatment

It has been opined that cancer cells return to a fetal pattern of survivin expression to enhance cell viability, resist apoptotic stimuli and thereby become capable to overcome the cytotoxic effects of chemotherapeutic agents. Furthermore, it has been seen that survivin transfected cells demonstrate resistance to anticancer drug-induced apoptosis. Chi square test was applied to calculate level of significance with respect to duration of smoking and insignificant results were obtained [8].

Table1.1: Association of survivin expression with smoking

IRS level	Absent %	Duration of smoking	
		1-5	5-10
No	21	25	0
Weak	25	25	25
Moderate	31	25	75
High	22	25	0
Total	100	100	100

DISCUSSION:

Cancer remains the second leading cause of death after cardiovascular diseases globally and third leading cause of mortality following heart and diarrheal diseases in developing countries. Oral SCCs account for approximately 500,000 new cases worldwide, making them the 6th most common cancer type in the world and they are the third most common cancer in developing countries with high incidence in south East Asia and India [9]. Despite advances in treatment, the overall 5 year survival rate for oral SCCs is merely 50% with most patients at high risk for loco regional recurrence and distant metastasis [10].

Carcinogenesis is a multistage process involving the activation of oncogenes and the inactivation of tumour suppressor genes. Biomarkers are currently being used in diagnosis and prognosis of several diseases. Apoptosis has become a basic tool in developing cancer research and establishing new strategies in managing cancer [11].

Survivin has been found as a good prognostic marker in Oral squamous cell carcinoma. Survivin is a recently characterised IAP protein, which is expressed in most solid and haematological malignancies and the gene encoding human survivin was cloned by Ambrosini et al. in 1997. Survivin is not produced in adult tissues except for the thymus, placenta, basal colonic epithelium, endothelial cells and neural stem cells [12]. In OSCC conventional prognostic factors such as clinical stage, tumor size, and lymph node metastasis are not always accurate. In addition due to heterogeneity of tumor biology between affected individuals, prognostic factors are currently lacking. Thus there is a need for additional factors including molecular markers for early detection and to explain the mechanism of development and recurrence in OSCC [13].

CONCLUSION:

It is concluded that survivin in oral premalignant lesions can be a marker for progression to malignancy. Survivin in oral premalignant lesions can be a marker for progression to malignancy. It has a role in malignancy as a diagnostic marker, predicting progression and can be used for therapeutic purpose

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