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Salivary Markers in Cancer Diagnosis – A Review.

N Aravindha Babu, KMK Masthan, T Gopalakrishnan, and M Elumalai*

Department of Oral Pathology and Microbiology, Sree Balaji Dental College & Hospital, Bharath University, Chennai.

*Department of Pharmacology, Sree Balaji Dental College & Hospital, Bharath University, Chennai.

ABSTRACT

The components of saliva “epitomize the body’s health condition”. Saliva contains biomarkers from serum, mucosal transudate and gingival fluids. Since using saliva is simple, non-invasive, safe, inexpensive, less time consuming it can also be used in community health care programs. It aids to detect diseases and to improve the general health and dental health of the public. This review article gives details about salivary tumor markers and their role in diagnosis of tumors.

Keywords: tumor markers; Saliva; tumors; Gingival fluids.

**Corresponding author*

INTRODUCTION

It has been used as a diagnostic medium for several years no [1-3]. Saliva is mainly secreted by three major glands and many other minor salivary glands in the oral cavity, which provides the basic functions like taste and helps in lubrication, digestion and speech. The secretions from these glands is mixed with nasal and bronchial secretions, gingival crevicular fluid, blood from bleeding gums, micro organisms, exfoliated epithelial cells and the food debris [4,5].

Saliva has tumor markers derived from serum, gingival crevicular fluid and mucosal transudate. Systemic and oral diseases turn out markers that appear in saliva. higher concentrations of diagnostic biomarkers are seen more in Unstimulated saliva than stimulated saliva. Since that is used more for diagnostic purpose. It is because, stimulated saliva has low concentrated proteins [6,7] other than diagnosing various diseases, drug monitoring system [8] helps in detecting drug abuse.

There are various advantages in using saliva as a diagnostic aid. It is non-invasive, safe, cost effective, can be used in mass screening and time saving [5,9]. The salivary tumor markers and their role in diagnosis of various tumors are briefed in this article.

DISCUSSION

Till date, most of the markers have been identified from various body fluids. Among which saliva and blood are the most extensively studied body fluids. Saliva can be used as a diagnostic medium for Oncology (Oral Squamous Cell Carcinoma, Cervical Cancer and Breast Cancer), Infectious Diseases (Viral Diseases, Bacterial Infections, and Fungal Infections), Cardiovascular Diseases, Autoimmune Diseases (Sjogren's syndrome), Endocrinology, and Psychiatry. Tumor markers are the cellular, biochemical and molecular characteristics by which normal/abnormal processes can be recognized and/or monitored. The tumor markers for various tumors are as listed below.

Oncology

Saliva would be ideal for screening pre-malignant and malignant neoplasms because of its anatomical proximity. Presence of salivary proteomics and genomics signatures for breast cancer has been explained by various studies [10,11].

They have reported Her2/neu as the first salivary marker for breast cancer and also recognized increased levels of CA 15-3 and Her2/neu as well as decreased levels of p53 in patients with breast cancer. Elevated salivary levels of CA 125 in patients with ovarian cancer has also been found [12].

It has been reported that gastric cancer can also be recognized at initial stage by using saliva proteome analysis [13]. Salivary leptin was expressed in much higher levels in salivary gland tumors [14].

Among all the tumors, oral cancer is one such tumor where saliva can show the greatest benefit because of its direct contact with oral lesions [15]. As mentioned early saliva in the oral cavity also has exfoliated cells from the oral cavity.

The studies have examined DNA aberrations, enzymes, mRNAs, growth factors, metalloproteinase's, cytokines, telomerase, cytokeratins etc. in oral cancer [16-22].

The bio markers are p53 antibody which can be detected in oral squamous cell carcinoma [23], high level of salivary kallikrein in oral malignant tumors [24-26] and Ca-125, a glycoprotein for ovarian cancer [27].

MicroRNAs (miRNA) also have been found in human saliva and two miRNAs, miR-125a and miR200a, were found to be present in significantly lower levels in the saliva of OSCC patients than in healthy controls.

For other diseases and drug monitoring

Soluble tumor necrosis factor and Beta 2 micro globulin are high in HIV patients [28,29]. Presence of helicobacter pylori is a sign of peptic ulcer [30,31]. Saliva can also be used to detect and monitor drugs like opioids, barbiturates, cocaine, diazepines, cannabinoids, cotinine, and ethanol [32,33].

CONCLUSION

Thus, the development of salivary diagnostic tools is of principal importance, especially in detection of high risk of cancer, patients with premalignant lesions and patients with prior history of cancer [36].

Although challenges remain ahead, the use of saliva - based diagnostics are promising for future application to diagnose and prognosticate treatment outcomes.

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