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CASE REPORT

SALIVA AS A RECENT ADVANCE IN THE DIAGNOSIS OF ORAL CANCER

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ABSTRACT

As a diagnostic fluid, saliva offers superiority over serum due to both aninexpensive n noninvasive collection method by specially trained persons and a cost-effective approach for screening of large populations. These noninvasive tests offer advantages over other tests that involve invasive techniques such as sampling of the subgingival flora or taking a blood sample. Collection of saliva offers a reduced risk of infection compared to the collection of serum. Moreover, obtaining saliva samples from infant, disabled or anxious patients, is much easier than obtaining other samples. There is a lot of useful components-changing information in saliva when a person is in sick. Therefore, we define these changing components as **"**biomarkers". As *better diagnosissaves lives*, utilization of biomarkers as early predictors for clinical disease not only contributes to the effective prevention and treatment of diseases, but also enhances the assessment of potential health risk.

INTRODUCTION

Saliva is the fluid that bathes the oropharyngeal cavity. It is composed for the most part, of secretions from three pairs of major salivary glands: the parotid, submandibular and sublingual (SL) glands. It also contains secretions from numerous minorsalivary glands: the labial, buccal, lingual and palatal glands.4 Whole saliva also contains components found in plasma, some of which enter whole saliva from the gingival fluid associated with inflamed gingival tissues. Saliva performs several key functions, including protecting the oral cavity from infections such as caries andpromoting swallowing and degradation of ingested food. In general, antibacterial, antifungal and antiviral activities are associated with the mucins, lactoferrin, lactoperoxidase, histatins, cystatins and immunoglobulins found in saliva. The various conditions where saliva has been used as a diagnostic tool includes *autoimmune diseases like Sjogrens syndrome, head and neck cancer and cancer of other systemic sites, infectious diseases inclusive of viral, bacterial and fungal diseases, hereditary diseases like cystic fibrosis, drug and hormone monitoring and also for the diagnosis of systemic diseases like cardiovascular diseases, respiratory diseases, renal diseases and psychosomatic disorders.* Of the lot, use of saliva as a diagnostic aid in oral cavity cancer is gaining immense popularity due to the close anatomic proximity of saliva to both pre-malignant and malignant neoplasms making it ideal for screening of these lesions.

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Oral squamous cell carcinoma (OSCC) is one of the most common epithelial malignancies with significance morbidity and mortality. Inspite of diagnostic and therapeutic advances over the decades, the disease still remains a challenge for medical professionals with the five year survival rate being 30%-50% (Li *et al*., 2004). Recent observations indicate that the clinical and histological appearance of oral mucosa may not truly depict the damage occurring at the genetic level.

Clinical implications

Because patients often visit a dentist more regularly than they do a physician, there is increased discussion in the dental community regarding the need for practitioners to be aware of salivary diagnostics and to be willing and able to administer these tests to their patients. Many clinically important molecules can be detected through salivary testing, including bacterial DNA and antibodies, viral DNA and antibodies, steroid hormones, cancer markers and salivary messenger RNA (mRNA).

Collection and storage of saliva

Saliva can be collected under both resting and stimulated conditions. Certain approaches to store saliva in order to prevent degradation of salivary compounds include (Chiappan *et al*., 2007). Immediate storage without any processing; if analysis is to be done within 30-90min, saliva can be stored at room temperature; for analysis after 3 to 6hrs from collection, storage is to be done at +40C and if analysis is to done after

days to months after collection, storage is to be done at -200C or still better at -800C. Snap freezing of saliva in liquid nitrogen. Inhibition of enzyme activity in saliva by mixing with certain enzyme inhibitors. Addition of sodium azide to retard bacterial growth. Addition of trifluor acetate to denature salivary enzymes that could degrade salivary compounds such as proteins and steroid hormones.

Salivary tumor markers in oral cancer

Oral cancer is a common and lethal malignancy. Direct contact between saliva and the oral cancer lesion makes measurement of tumour markers in saliva an attractive alternative to serum testing.

Five markers increased in cancer patients

1. Carbonyls
2. Lactate dehydrogenase
3. Metalloproteinase-9 (MMP-9)
4. Ki67
5. Cyclin D1 (CycD1)

Altered mRNATranscripts:rna

Molecules transcripts of which play an important role in patients suffering from oral squamous cell carcinoma.. Seven mRNA seen in oral squamous cell carcinoma:

1. IL8 (interleukin 8) playing a role in angiogenesis; replication; calcium-mediated signaling pathway; cell adhesion; taxis; cell cycle arrest; immune response.
2. IL1B (interleukin 1) which takes part in ca RNA for years was thought to quickly degrade in saliva due to the various RNAses that saliva contains. Various mRNA molecules were found up-regulated in the saliva of in signal transduction; proliferation; inflammation and apoptosis.
3. DUSP1 (dual specificity phosphatase 1) with a role in protein modification; signal transduction and oxidative stress,
4. H3F3A (H3 histone, family 3A) having a DNA binding activity, a role in protein binding an ion binding,
5. SAT (spermidine/spermine N1-acetyltransferase) which takes part in enzyme and transferase activity- were found significantly elevated in OSCC patients rather than in healthy controls
6. OAZ1 (ornithine decarboxylase antizyme 1) taking part in polyamine biosynthesis 7. S100P (S100 calcium binding protein P)

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