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Editorial

Saliva - A Promising Diagnostic Tool: Dental Curricula Require Update

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Blood, since long has been utilized to assist clinicians in the confirmation of their clinical or provisional diagnosis of various diseases. Though it is considered as tried and tested tool for diagnostic purpose in most of the diseases, but it is stressful and painful for the patients. In the pediatric patients and the patients with nervousness and apprehension, sample collection becomes troublesome for the phlebotomists. Moreover, needle prick during blood draw from the vein has the risk of developing problems like infection at the injection site, bruising, excessive bleeding, hematoma formation and fainting or dizziness.

As an alternative, saliva has shown great promise to be employed as an emerging diagnostic tool in numerous pathological conditions. Salivary tests possess multiple advantages over blood tests because;

1. Sample collection is very easy and convenient as it is absolutely a non-invasive and pain-free procedure requiring no specialized equipment or services of a trained personnel.
2. Salivary tests offer prompt results that help in early diagnosis, as early diagnosis is the key to prevent delay in the treatment.
3. There is minimal risk of cross infection.
4. Saliva tests are far economical than blood tests.

Saliva is a clear body fluid of an average pH of 6.7 which is secreted by three pairs of major salivary glands and numerous minor glands situated at multiple sites in the oral cavity. 90% of the saliva is produced by Parotid, submandibular and sublingual glands and 10% is secreted by the minor glands.

There are many diseases that remain undiagnosed until a late stage of the disease arrives and its sign and symptoms become clinically evident. To avoid such late diagnosis, scientists have unraveled biomarkers present in the human body.

A biomarker is a biological indicator of physiologic and pathogenic processes occurring in an individual's body. Recognition of such markers proves beneficial for the diagnosis and prognosis of diseases and for monitoring the progression of the diseases.

These biomarkers include genetic material RNA, DNA and protein molecules that reflect the existing physiological or pathological state of a person which helps to know the underlying cause of a disease [1].

Like blood serum, saliva contains wide range of these molecules including various hormones, antibodies, growth factors, enzymes, microbes and DNA which can be used for diagnostic purpose [2].

During the recent past, saliva has increasingly gained popularity and has been effectively employed for the diagnosis of numerous systemic diseases including Diabetes, Cardiovascular diseases, HIV, Asthma, Cancers and COVID-19.

Many diseases with dental and oral manifestations have a genetic basis, hence, like systemic diseases, salivary tests may also be applied for predicting the oral and dental ailments; caries, periodontal diseases and Oral cancers. Alterations in saliva quantity and composition provide potential evidence to detect and monitor dental caries. Mucin present in saliva, takes part in protective mechanism against caries initiation and protects it from desiccation [3].

The proline-rich proteins are a group of proteins produced by parotid and submandibular glands and constitute 70% of salivary proteins. They reduce the incidence of caries by neutralizing the acid produced by oral acidogenic bacteria, Mutans Streptococci [4]. Various biomarkers have been investigated for the diagnosis and prognosis of periodontal diseases and it has been verified that variations in more than 70 genes can lead to periodontal diseases [5].

In a study, genetic mutations of the IL-6 gene were found as a substantial risk factor for chronic periodontitis in North Americans [6]. Salivary biomarkers have a strong potential to identify individuals who might develop oral cancer, as many researchers have documented those salivary levels of specific proteins were found increased in whole saliva of patients having oral squamous cell carcinoma [7].

The diagnostic role of saliva has miserably failed to obtain attention of the practicing dentists. The logical reason behind this negligence appears to be either short/ substandard or total lack of knowledge about the genetics education offered to dental students during their basic Dental Degree program.

According to a US based survey, 94% schools do not require genetics education for entry into a dental school. A formal ge-

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netics course is offered in merely15% schools. It is surprising to observe that though current information on genetics has been available for more than two decades, the adaptation of this worthwhile evidence into the dental curriculum has been at a very low pace. Education on genetics disseminated at undergraduate level in dental schools will significantly influence the integration of genetics into dental practice.

It is therefore, suggested that more emphasis on genetics education should be given in dental schools to produce future dental graduates who possess knowledge about genetics and be capable of discussing benefits and limitations of the biological, clinical, and ethical issues associated with genomic-based health care.

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