

Salivary Profile of Children and Young Adults and the Impact of Health and Lifestyle

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It is often presumed that salivary secretion diminishes with age and the growing adult population usually suffer from oral dryness and related complaints. With growing age, the number of acini reduces and the amount of fatty and fibrous tissue increases. Furthermore, synthesis of proteins also reduces with advancing years and the alterations may occur in the activity of the organic components of saliva. Due to the alterations in immunological systems of oral cavity it is more susceptible to environmental factors [1]. Therefore, for the detection of diseases at premature stage in infants before their oral feeds, the utmost need is to have non-invasive biomarkers. While comparing the data in healthy infants till puberty through their health and life style, genomic and proteomic salivary analysis provides robust, novel, wide-range, synchronized information regarding nearly all organs and tissues in the developing preterm infant [2].

The detection of physiological dysfunction or pathology by quantification of protein levels in biological fluids is considered an important diagnostic method for the identification of diseases [3]. Currently, with the advancements in various “omics” fields (genomics, transcriptomics, metabolomics, proteomics, and metagenomics) analysing human whole mouth saliva (WMS) has become a much more attractive option for the research and industrial communities. With the advent of these more sensitive and accurate technologies, human whole mouth saliva (WMS) has rapidly advanced as a current and future diagnostic tool for the clinical diagnosis and early detection of oral and systematic diseases, hormone monitoring, screening for antiviral antibodies, viral antigens and drug monitoring. By comparing data in healthy infants with data from infants and adolescents who develop medical complications, can we expect to identify new biomarkers that will ultimately improve newborn care [4].

Through highlighting the relationships between saliva and health by high dimensional science approaches and by working to get the most done using creative means through pushing the cutting edge methods and technologies by the development of salivary biomarkers, salivary diagnostics in head and neck cancers, point of care technology, pioneering saliva collection devices, significance of exosomes in diagnosis. Moreover, by using intricate hypothetical models and designs different levels of relationships can be investigated. Hence, with the provision of time and energy that will target the selective areas such as stress and anxiety, infertility, aging, hormonal imbalance, menopause, diabetes, smoking, cardiovascular diseases will help in the improvement of quality of life and wellbeing of humans.

Over the recent decade, exosomes came into focus in science and technology [5] as most ground-breaking discoveries in research world because of their small size, relative stability and omnipresence in almost all biological fluids such as plasma, urine, saliva, seminal fluid, synovial fluid, breast milk, ascites, broncho-alveolar lavage fluid, amniotic fluid and cerebrospinal fluid (CSF). Human exosomes has autoantigens and are fundamentally related to yeast composition wise, and are involved in RNA processing and degradation. As described

by Brouwer, *et al.* [6] autoantigens in humans like PM/Scl-100 and PM/Scl-75 are homologous to exosomes in yeast and PM/Scl protein complex in exosomes were linked to ribosome biogenesis and myositis and scleroderma and may also be implicated for mediating apoptosis i.e., in breast cancer cells [7]. Also they are involved in growth, differentiation, coagulation, inflammation, transmission and stress reactions of cells [8]. They are also significant for vaccines and drugs combinations by locating the target antigen on exosomes advances of immunogenicity of vaccines which consecutively takes part in progression of therapeutic potential of disease [9].

In the field of oral and systemic research, use of novel biomarkers for early detection and prognostication approaches including metabolic, proteomics, genomics and bioinformatics. Additionally, salivary proteomics provides specific biomarkers that becomes a diagnostic tool and takes it from lab to clinics to fight against diseases. There are several multiple genes which are involved in the progression of disease due to its molecular and cellular heterogeneity, therefore, panel of candidate biomarkers makes a particular diagnosis. Consequently, the easy availability and non-invasive collection of saliva has shifted the focus of diagnosis from serum to saliva. With the development of novel and innovative technologies salivary diagnostics is gradually flourishing such as with the usage of gel electrophoresis, chromatography, high performance liquid chromatography (HPLC), Enzyme-linked immunosorbent assay (ELISA), microarrays, Polymerase chain reaction and many more, point of care technologies can be developed to make the diagnosis on chairside. Furthermore, primary screening through saliva could be the best choice with the advancements in proteomics and genomics and extensive discovery of novel biomarkers and their validation will transform the field of diagnosis for many oral and systemic disease activities. Salivary diagnostics, hence, gives a glimpse of future for significant activities in clinical diagnosis and biomedical research [10].

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