Saliva: A non-Invasive approach towards diagnosis

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Saliva is a thin substance produced in the mouths of humans and most animals. It is a component of mouth fluid. Saliva is produced by salivary glands: the parotid, sublingual, and submandibular glands. Supplementary minor salivary glands also take part in the production of saliva. Human saliva consists of water, mucus, electrolytes, glycoproteins, enzymes, and antibacterial (secretory IgA and lysozyme) [1]. Daily production of saliva is 0.75-1.5 litres per day, insignificant salivary flow has been noticed throughout sleep. The saliva has some important functions; it contains enzymes (lipase, amylase or ptyalin) which start the process of digestion of dietary starches and fats. It also washes particles of foodstuff adhered to the tooth surface and protects the teeth from building up bacterial plaque. Saliva contains secretory IgA so

it also acts as an antibacterial mediator, it initiates the procedure of swallowing by wetting the food and protects the mucosa from dryness [1,2]. Saliva is a oral fluid which constitutes multiple components and has high prospective for the observation of universal diseases and health [3]. Salivary production could be enhanced or suppressed by certain drugs, sialagogues increase the salivary flow and antisialagogues decreases the salivary flow [1]. Expulsion of saliva against your will is called as spitting and it is considered to be as offensive in different parts of the globe.[1] Saliva can be measured as gland specific and whole saliva. Individual collection of saliva from submandibular and sublingual glands is difficult because these glands pierce the oral cavity via Wharton's duct. Gland specific saliva consists of individual collection of saliva from submandibular, parotid, sublingual glands and minor salivary glands, gland specific collection is helpful in particular gland pathology that is obstruction and infections. Whole saliva is most frequently studied when salivary analysis is used for the evaluation of systemic disorders [1]. Whole saliva consists of combination of oral fluids based on salivary and non salivary origin, salivary origin consists of secretions from minor and major salivary glands and non salivary origin secretions includes nasal and bronchial secretions, blood and serum derivatives gingival crevicular fluid (GCF), certain bacteria's and bacterial products, viruses and fungi.

Whole saliva is repeatedly evaluated for the detection of different systemic disorders [4]. Study of saliva is helpful for the identification of autoimmune diseases, infectious diseases, malignant diseases, endocrine disorders and for the evaluation of illegal usage of drugs. Saliva is helpful in diagnosing of disease in children's because of least compliance of collection as compare to blood and cost-effectiveness has been seen in larger populations [4].

There are different ways of collecting saliva, one is by certain stimulants for example a subject is asked to chew on paraffin or citric acid has been applied on the tip of tongue. All such stimulants increase the quantity of saliva. Another method of collecting saliva is unstimulated method in this method a subject is exposed to some lights or body positions will be changed to

increase the flow of saliva but not the quantity. One of the most appropriate method of collecting saliva is by draining method, in this method saliva is allowed to dribble from the lower lip [4] Surveys has shown that donation of saliva is preferable rather than blood and urine donations for the diagnosis of disease and respondents are more enthusiastic to take part in the research methods if it's just a matter of saliva donation [5]. Saliva is helpful in detection and calculation of various disease progression [6]. Blood contains electrolyte, hormone, immunoglobulin's that can enter in saliva through blood barrier. Saliva constituents are related to serum, the essential proteins which are present in serum are also found in saliva. Saliva proteins are similar in blood and certain saliva proteins are matched with blood proteins that influence senile dementia, breast cancer and diabetes. Proteomics and techniques related to this has been used for the study of saliva and uptil now 309 kind of proteins have been identified in healthy saliva, presence of copious amount of protein constituents in saliva can be used certainly as biological markers of cancer and other diseases [6]. The saliva proteome technique is very helpful in diagnosing gastric cancers clinically. Early recognition and management of gastric cancer is essential in decreasing the rate of death [7].

Three fundamentals are essential for the examination of health status:

1. A collection of true samples by non-invasive technique.
2. Biomarkers associated with healthy and diseased patients.
3. To quickly distinguish biomarkers [8].

Saliva also plays a very important role in the mineralization of enamel. To maintain the integrity if saliva it needs to be place on ice or store in freezer, the refrigeration prevents the breakage of molecules in saliva [9].

Hence, Saliva contains certain physiological proteins and nucleic acids like blood, salivary diagnostic techniques provides an easy, cost effective and non invasive approach for the diagnosis of oral and systemic diseases and it fulfills the requirement to reach the optimum

target. More research should be done for the identification of diseases associated with salivary biomarkers.

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