SALIVA

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SALIVA is the fluid secreted by the salivary glands that begins the digestion of food & also maintains tissue integrity.

- The saliva is secreted by the salivary glands.
- The main function of salivary gland is the production and secretion of saliva.
- It is classified into :

Major Salivary Glands: 1) Parotid Gland
2) Submandibular Gland
3) Sublingual Gland

Minor Salivary Glands:

present in groups beneath the oral epithelium & generally opened by very small ductules.

COMPOSITION

99 % Water

0.5 % organic & inorganic constituents

Organic constituents

Lysosomes , Lactoferrins , Myeloperoxidase ,

Lactoperoxidase ,

Agglutinins such as glycoprotiens, mucins, fibronectins,

beta-2 macroglobulins

Antibodies

Inorganic constituents

Ions & Gases

Bicarbonates

Sodium, Potassium, Phosphate, Calcium, Fluorides, Ammonium

Daily salivary output

Estimates range from 0.75 to 1.5 liters per day while it is generally accepted that during sleep the amount drops to almost zero. In humans, the sub-mandibular gland contributes around 70-75% of secretion, while the parotid gland secretes about 20-25 % and small amounts are secreted from the other salivary glands.

FUNCTIONS OF SALIVA

1. Lubrication

   Lubrication is done by Glycoprotiens & mucoids.

   They washes away the food debris & coated substances from the teeth by their lubricating property.

2. Physical Protection :

By Glycoprotiens & mucoids

Mechanism : by forming a coating simillar to Gastric mucin.

Action :

- Acts as a barrier against proteolytic enzymes & hydrolytic enzymes produced in plaque.
- Barrier against potential cariogens.
- Barrier against dessication.

3. Buffering action :

The maintenance of physiological hydrogen ion concentration (ph) at mucosal epithelial cell surface & tooth surface is an important function of saliva.

This action is mainly directed against acidogenic microorganisms & on mucous membrane surface where acid formation from food occurs.

Many bacteria require specific ph & hence saliva prevents the pathogen from colonizing by denying it of the optimal enviornmental condition.

4. Tooth Integrity Maintenance :

By minerals, glycoprotiens & pellicles.

Saliva provides minerals for post- eruptive maturation. Which

- Increases surface hardness.
- Decreases permiability.
- Increases resistane to caries.

It also provides ions like Calcium & Phosphate to prevent tooth dissolution.

Forms a film of glycoprotien on teeth which acts as diffusion barrier.

5. Antibacterial Actions :

Immunoglobulins :

Ig G , Ig M , Ig A (most prominent)

- Salivary antibodies appear to synthesized locally.
- Bacterial cells coated with secretary Ig A have reduced tendency to adhere to teeth & mucous membrane. So that they may clump & swallowed.
- Ig A antibodies present in Parotid saliva can inhibit attachment of oral streptococcus to

Lysosomes :

Breaks bacterial cell wall.

Lactoperoxidase – thiocynate system :

bactericidal to some strains of lactobacillus & streptococcus by preventing accumulation of lysine & glutamic acid, both of which are essential for bacterial growth.

Lactoferrin :

Effective against actinobacillus.

Myeloperoxidase :

Bacteriocidal for actinobacillus

inhibits attachment of actinomyces strains to hydroxyappetite.

Antiproteases :

Combats proteolytic enzymes.

Inhibits cysteine proteases such as cathepsin.

Antileucoproteases :

Inhibit elastase.

Tissue Inhibitor of Matrix Metalloprotinase :

inhibits activity of collagen degrading enzymes.

Salivary Glycoprotien :

Inhibits absorption of bacteria to epithelial cell of oral mucosa.

This activity seems to be assosiated with glycoprotiens that posses blood group reactivity.

Leucocytes (PMNs) :

Reach the oral cavity by migrating through lining of gingival sulcus.

They are referred as OROGRANULOCYTES.

Anti viral function : secretory Ig A.

Anti fungal function :

Salivary Mucin & Histidine rich peptides.

6. Other Functions :

Digestion : By Amylase which acts on starch.

Taste : Dissolve substances & carries them to taste buds.

Protection : By recognization of noxious stimulus.

Dilutes gastric chyme.

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COLLECTION OF SALIVA :

- # For collection of whole saliva, stimulation of saliva is done by asking the patient to suck on sour candy or sour grapes.

standardized method is to swab a solution of 2 % citric acid on the back &side of tongue at 15 seconds intervals.

Secretion can be obtained by Draining, Spitting, & Suction.

INSTRUMENTS for collection from glands :

Parotid Collector

Segregator

- **Parotid collector**: it is composed of 2 concentric circle which fit over the stensen's duct is connected to a graduated collecting tube.

- **Segregator**: it is made up of plastic or metal. The plastic is covered with rubber base impression material & placed on the floor of the mouth beneath the tongue, after 5 min impression are removed.

✓ Recess is then made in the impression ,over the opening of wharton's duct & plastic collecting tube is attached .

✓ collector stays in the position when the patient hits tongue against the lingual surface of lower incisors.

Diagnostic test of the Salivary Gland

- Sialography: It is a method of studying, Radiographically, Salivary gland & alveoli of the parotid & submandibular gland.

✓ it is done by injecting radiopaque contrast medium into the duct system of salivary gland & its distribution and study by roentgenogram.

- **Salivary Gland Scanning (Scintigraphy) :** It provides the indication of salivary gland functions and allows bilateral comparisons & images of all 4 major glands at the same time.
- **Ultrasonography:** It is used for identification of radiolucent stone.
- **CT – Scan:** It demonstrate the small difference in soft tissues X- ray examination & distinction between gland & adjacent tissues .

- **Arteriography**: It defines the vasculature of the tumor but also delinates the origin of vascular supply.
- **Biopsy**: most significant advancement in diagnosis & appropriate treatment of major salivary gland tumors.
- **Flow rate studies**: It provides the information about salivary gland function.
- **MRI**

DISEASES RELATED TO SALIVA

SIALORRHEA

- an excessive flow of saliva.
- Hypersalivation or ptyalism
- It may be associated with acute inflammation of the oral cavity, mental retardation, neurologic disorders, pregnancy, ill-fitting dental appliances, cystic fibrosis of the pancreas, teething, alcoholism, and malnutrition.

XEROSTOMIA

- Dryness of the mouth caused by cessation of normal salivary secretion.

- The condition is a symptom of various diseases such as diabetes, acute infections, hysteria, and Sjögren's syndrome and can be caused by paralysis of facial nerves. It is also a common adverse reaction to drugs.

ROLE OF SALIVA IN PERIODONTAL DISEASE

1. PELLICLE & PLAQUE DEPOSITION :

 - Saliva influences Supragingival plaque deposition & activity in many ways.

 - first stage of plaque formation is Deposition of Pellicle.

 - Pellicle consists of high molecular weight glycoprotiens derived from salivary glands.

 - In maturation stage, it provides agglutinating substances & other protiens which results in bacterial adhesion.

2. PLAQUE MINERALIZATION & CALCULUS FORMATION :

- Mineral components of supragingival calculus is derived from saliva.

- Calculus is deposited more opposite to orifices of salivary duct opening.

- Heavy calculus formers show increase calcium concentration in saliva.

- An increase in inflammatory gingival disease, dental caries, and rapid tooth destruction associated with cervical or cemantal caries is partially a consequence of decreased salivary gland secretion.

EFFECTS OF DRUGS &CHEMICALS ON SALIVARY SECRATION

- Sympathomimatic drugs : Adrenaline,Ephedrine…… Stimulate the salivary secretion
- Parasympathomimetic drugs:

  Acetylcholine, pilocarpine, muscarine & physostigmine …… Increase the salivary secretion
- Histemine: Stimulate the salivary secretion

- Sympathetic depressants like ergotemine & Dibenamine abolish the salivary secretion.
- Parasympathetic depressants like atropine and scopolamine inhibit the secretion of saliva.
- Anesthetics like chloroform and ether stimulate the reflex secretion of saliva.
- Deep anesthesia decreases the secretion due to central inhibition.


THANK
YOU..