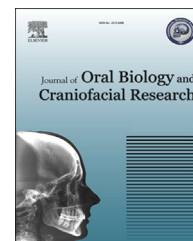




ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/jobcr

Original Article

Saliva as a prediction tool for dental caries: An in vivo study



Shikha Singh ^{a,*}, Arun Sharma ^b, P.B. Sood ^c, Archana Sood ^d, Iram Zaidi ^e, Anju Sinha ^f

^a Senior Lecturer, Department of Pedodontics and Preventive Dentistry, Shree Bankey Bihari Dental College, Masuri, Ghaziabad, Uttar Pradesh, India

^b Professor and Head, Department of Pedodontics and Preventive Dentistry, Institute of Dental Studies and Technology, Modi Nagar, Ghaziabad, Uttar Pradesh, India

^c Director of PG Studies, Professor and Head, Department of Pedodontics and Preventive Dentistry, PDM Dental College and Research Institute, Bahadurgarh, Haryana, India

^d Professor and Head, Department of Biochemistry, ESI Hospital Rohini, New Delhi, India

^e Reader, Department of Pedodontics and Preventive Dentistry, Shree Bankey Bihari Dental College, Masuri, Ghaziabad, Uttar Pradesh, India

^f Senior Lecturer, Department of Oral Pathology and Microbiology, Shree Bankey Bihari Dental College, Masuri, Ghaziabad, Uttar Pradesh, India

ARTICLE INFO

Article history:

Received 4 March 2015

Accepted 1 May 2015

Available online 3 June 2015

Keywords:

Saliva

Amylase

Phosphorous

Streptococcus mutans

Dental caries

ABSTRACT

Introduction: The present study was undertaken to assess the caries activity by comparing the pH, buffering capacity, calcium, phosphorous, amylase along with the association of mutans in saliva for caries-free and caries-active children and to find out the interrelationship amongst the two groups.

Methodology: The study sample of 80 children, aged between 4 and 8 years were included in the study. Caries status of each child was recorded using DMFS. They were divided into two groups: (i) caries-free group (40) and (ii) caries-active group (40). After collecting the salivary samples, mutans were determined using Saliva-Check mutans kit and buffering capacity by Saliva-Check Buffer kit. The remaining samples were sent to laboratory for analyzing pH by electrode pH meter, calcium by OCPC(o-cresolphthalein complexone) photometric method, phosphorous by phosphomolybdate/UV method, amylase by CNP-G3(2chloro-4-nitrophenyl-alpha-maltotrioxide) method using semi-autoanalyzer.

Results: The results obtained were tabulated and subjected to statistical analysis. The pH, buffering capacity, calcium and phosphorous level were found to be increased with the decrease in the caries activity of the children whereas amylase activity was increased with the increase in caries activity. It was observed that 77.5% children were tested positive and 22.5% were tested negative for mutans in caries-active group whereas 100% children were tested negative for mutans in caries-free group.

* Corresponding author. M-207, SPS Heights, Opposite DPS Indrapuram School, Ahinsa Khand II, Indrapuram, Ghaziabad, Uttar Pradesh, India. Tel.: +91 8527930000, +91 9311746888 (mobile).

E-mail address: shikhasaxena81@gmail.com (S. Singh).

<http://dx.doi.org/10.1016/j.jobcr.2015.05.001>

2212-4268/Copyright © 2015, Craniofacial Research Foundation. All rights reserved.

Conclusion: The physicochemical properties of saliva, such as pH, buffering capacity, calcium, phosphorous, amylase and *Streptococcus mutans* has a definite relationship with caries activity.

Copyright © 2015, Craniofacial Research Foundation. All rights reserved.

1. Introduction

Oral cavity is constantly exposed to the influence of adverse environmental factors and saliva is the first secretion to come in contact with exogenous substances. This complex biofluid represents a mixture of various fluids and components that helps in maintaining the oral health.¹

Dental caries is an infectious, communicable disease resulting in demineralization and destruction of tooth structure by acid-forming bacteria. The number of mutans streptococci in saliva can be used for evaluating the caries risk.²

The study of saliva has always been an interesting aspect as saliva represents all the ions usually present in body fluids. The ability of saliva to buffer acids is essential for maintaining pH values in the oral environment. Bicarbonate ions play a major role in determining the pH and buffering capacity of saliva that can help protect teeth against attack from acids produced by bacteria.

Saliva also plays an important role in maintaining the integrity of dental tissues due to the presence of calcium, phosphorous and other inorganic ions as this environment is known to facilitate remineralization of incipient lesions or demineralized zones of enamel. Thus calcium and phosphorous in saliva forms a natural defense mechanism against dissolution of teeth.³

Amongst the various other salivary enzymes and electrolytes, amylase is the most abundant enzyme found in human saliva and is thought to be causing caries by binding its alpha portion to the bacteria.

Thus the study aims to compare the physicochemical properties of saliva between the caries-free group and caries-active group, to find out the activity of *Streptococcus mutans* in both the groups and find out the association between salivary constituents, mutans and caries.

2. Material and methods

This study was conducted in the Department of Pedodontics and Preventive Dentistry and Department of Biochemistry, at I.T.S – CDSR, Muradnagar, Ghaziabad (UP). The permission of the Ethical and Research Committee was obtained prior to the study. Eighty children (boys 26 and 54 girls) between age group 4–8 years participated in the study. They were divided into two groups: caries-free and caries-active groups. Caries status of each child was scored by using decayed, missing, filled surface index (DMFS) given by Klein, Palmer, Knutson. Forty children were caries-free having DMFS = 0 as a control group and 40 were caries-active having DMFS \geq 5 as a study group.

After explaining the procedures for the study to the patient and their parents, informed consent was obtained. Each child was given a simple explanation as to the nature and reason for the tests following which the unstimulated salivary samples were collected in a graduated beaker and were further subjected to centrifugation for lab analysis. This excludes the chair side tests.

The collected salivary samples were conducted to following tests:

2.1. Chair side tests

- Saliva-check mutans kit (G.C Corporation, Japan) was used to analyze the presence of mutans. The sensitivity of kit is 90.9% and specificity is 97.4%. This kit provides a semi-quantitative evaluation of the level of mutans streptococci in saliva in 15 min by using monoclonal antibodies. (Fig. 1)
- Saliva-check buffer kit (G.C corporation, Japan) was used to determine the buffering capacity (Fig. 2).

2.2. Lab tests

- Systronics electrode pH meter 361(lutron) by systronics India Ltd. used to evaluate the Salivary pH⁴ (Fig. 3).
- Total calcium and phosphorous were determined colorimetrically on semiautoanalyser by OCPC (o-cresolphthalein complexone) photometric method at 570 nm and phosphomolybdate/UV method as an endpoint reaction at 340 nm respectively⁵ by commercially available kit from Erba Transasia Biomedical, Ltd.



Fig. 1 – Saliva-check mutans kit.

Download English Version:

<https://daneshyari.com/en/article/3157443>

Download Persian Version:

<https://daneshyari.com/article/3157443>

[Daneshyari.com](https://daneshyari.com)