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Determination of Streptococcus Mutans and Lactobacillus Counts and their Association with Resting pH of Saliva and Dental Caries in Preschool Children in Lagos.

Détermination du nombre de Streptococcus Mutans et de Lactobacilles et leur association avec le pH de Salive au Repos et les Caries Dentaires chez les Enfants d'âge Préscolaire à Lagos.

¹A. S. Omotuyole, ²F. A. Oredugba, ²E. O. Sote, ³S. I. Jaja

ABSTRACT

BACKGROUND: Caries is controlled by several factors including exposure to diets rich in carbohydrates, tooth susceptibility, and the presence of some oral flora bacteria such as *Streptococcus mutans* (*S. mutans*) and *Lactobacilli sp.* Tooth demineralisation occurs when the pH in the oral cavity is lower than the critical pH of 5.5 which occurs because of the production of acid by the acidogenic bacteria in the oral flora when they break down sugars (substrate) for energy.

OBJECTIVE: The objective of this study was to determine the salivary *Streptococcus mutans* and *Lactobacillus* counts and their association with resting pH of saliva and dental caries in pre-school children in Lagos.

MATERIALS AND METHODS: Fifty preschoolers with and without caries were recruited from the dental clinic and staff primary school in Lagos University Teaching Hospital, Idi-araba respectively. Saliva was collected in Thioglycollate media. The resting pH of the saliva was measured immediately in the clinic with a pH meter (Jenway pH meter, PHS 25). In the laboratory, the samples were streaked on Mitis salivarius bacitracin agar (MSB) and Rogosa agar for *S. mutans* and *Lactobacillus* respectively and incubated anaerobically for 48 hours at 37°C. Biochemical tests and morphological characteristics of colonies were used to identify *S. mutans* and *Lactobacillus*.

RESULTS: The children were aged between 45 to 71 months with a mean age of 56.66 ± 7.17 months. The mean age of the caries-free group was 55.48 ± 7.57 months and that of caries active group was 57.84 ± 6.76 months. The caries-active subjects recorded significantly higher bacterial counts of *S. mutans* and *Lactobacillus* compared to the caries-free subjects. *Streptococcus mutans* and *Lactobacillus* showed a negative and highly significant correlation with resting pH ($r = -0.38$ and $r = -0.32$ value respectively).

CONCLUSION: The resting pH of saliva in both groups was within normal values. Streptococcus mutans and Lactobacillus counts were significantly inversely correlated to the resting pH value of saliva. *Streptococcus mutans* and *Lactobacillus* counts were significantly higher in the caries active group. **WAJM 2023; 40(10); 1041-1048.**

Keywords: Bacterial count, Streptococcus mutans, Lactobacillus, Saliva pH, Preschoolers

RÉSUMÉ

CONTEXTE: La carie est contrôlée par plusieurs facteurs dont l'exposition à des régimes riches en glucides, la sensibilité des dents et la présence de certaines bactéries de la flore buccale telles que *Streptococcus mutans* (*S. mutans*) et *Lactobacilli sp.* La déminéralisation des dents se produit lorsque le pH dans la cavité buccale est inférieur au pH critique de 5,5 qui se produit à la suite de la production d'acide par les bactéries acidurogènes dans la flore buccale lorsqu'elles décomposent les sucres (substrat) pour l'énergie

BUT ET OBJECTIF: L'objectif de cette étude était de déterminer le nombre de *Streptococcus mutans* et de *Lactobacillus* et leur association avec le pH au repos de la salive et des caries dentaires chez les enfants d'âge préscolaire à Lagos.

MATÉRIEL ET MÉTHODES: Cinquante enfants d'âge préscolaire avec et sans caries ont été recrutés respectivement à la clinique dentaire et à l'école primaire du personnel de l'hôpital universitaire de Lagos, Idi-araba. La salive a été recueillie dans un milieu au thioglycolate. Le pH au repos de la salive a été mesuré immédiatement en clinique avec un pH-mètre (Jenway pH meter, PHS 25). Au laboratoire, les échantillons ont été striés sur gélose bacitracine Mitis salivarius (MSB) et gélose Rogosa pour *S. mutans* et *Lactobacillus* respectivement et incubés en anaérobiose pendant 48 heures à 37°C. Des tests biochimiques et des caractéristiques morphologiques des colonies ont été utilisés pour identifier *S. mutans* et *Lactobacillus*.

RÉSULTATS: Les enfants étaient âgés de 45 à 71 mois avec un âge moyen de 56,66 ± 7,17 mois. L'âge moyen du groupe sans carie était de 55,48 ± 7,57 mois et celui du groupe avec carie active était de 57,84 ± 6,76 mois. Les sujets actifs carieux ont enregistré un nombre de bactéries significativement plus élevé de *S. mutans* et *Lactobacillus* par rapport aux sujets sans caries. *Streptococcus mutans* et *Lactobacillus* ont montré une corrélation négative et hautement significative avec la valeur du pH au repos ($r = -0.38$ et $r = -0.32$ respectivement).

CONCLUSION: Le pH au repos de la salive dans les deux groupes était dans les valeurs normales. Les numérations de Streptococcus mutans et de Lactobacillus étaient significativement inversement corrélées à la valeur du pH de la salive au repos. Les numérations de *Streptococcus mutans* et de *Lactobacillus* étaient significativement plus élevées dans le groupe actif carieux. **WAJM 2023; 40(10); 1041-1048.**

Mots-clés: Numération bactérienne, Streptococcus mutans, Lactobacillus, pH de la salive, Enfants d'âge préscolaire

¹Department of Child Dental Health, Faculty of Dentistry, Lagos State University College of Medicine, Ikeja, Lagos, Nigeria

²Department of Child Dental Health, Faculty of Dental Sciences, College of Medicine, University of Lagos, Idi-araba, Lagos, Nigeria

³Department of Physiology, Faculty of Basic Medical Sciences, College of Medicine, University of Lagos, Idi-araba, Lagos, Nigeria

*Correspondence: Dr. Omotuyole, Aderinsola Sophia Department of Child Dental Health, Lagos State University College of Medicine, Ikeja, Lagos, Nigeria.

Email: dayrien03@yahoo.co.uk