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# Comparative Evaluation of Total Antioxidant Capacity and pH of Saliva in Children with and without Early Childhood Caries

## *Évaluation Comparative de la Capacité Antioxydante Totale et du pH de la Salive chez les Enfants avec et sans Caries Précoces de la Petite Enfance*

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### ABSTRACT

**BACKGROUND:** Early childhood caries (ECC), a type of tooth decay that affects preschool children, is a complex chronic disease resulting from an imbalance of multiple risk factors and protective factors of tooth decay, over time.

The antioxidant system in saliva is one of its defense mechanisms against disease agents. The pH of saliva also affects the integrity of the oral cavity, hence caries susceptibility.

**OBJECTIVE:** The study assessed and compared the total antioxidant capacity (TAC) and pH of saliva in children with and without ECC.

**METHODS:** Unstimulated whole saliva, using the passive drool method was obtained from children with and without ECC, matched for age and gender. The samples were analyzed for TAC using the phosphomolybdenum assay technique, and pH with a hand-held digital pH meter. Data was analyzed using the statistical package for Social Sciences (SPSS) version 21. Association between categorical variables was determined using Chi square, while analysis of variance (ANOVA) was used to compare the means. The level of significance (p value) was set at 5% (0.05)

**RESULTS:** A total of 68 children were examined (34 with ECC and 34 without ECC). The mean TAC in the ECC group was (0.53± 0.2) which was higher than the mean TAC of (0.36± 0.1) in the group without ECC. The mean pH (6.17±0.5) in the ECC group was lower than the mean pH (6.74± 0.5) in the caries-free group. The difference was statistically significant, p value<0.001

**CONCLUSION:** The saliva samples of children with ECC contained higher mean TAC and lower pH values compared to those without, who had lower mean TAC and higher pH values. This suggests a relationship between antioxidant production and cariogenesis. There was a statistically significant positive correlation between TAC and the pH of saliva in children with ECC. **WAJM 2024; 41 (5): 524 - 533**

**KEYWORDS:** Early childhood caries (ECC), Saliva, pH, Total antioxidant capacity (TAC)

### RÉSUMÉ

**CONTEXTE:** La carie de la petite enfance (CPE), un type de carie dentaire qui touche les enfants d'âge préscolaire, est une maladie chronique complexe résultant d'un déséquilibre de multiples facteurs de risque et de facteurs de protection contre la carie dentaire, au fil du temps. Le système antioxydant de la salive est l'un de ses moyens de défense. Les mécanismes contre les agents pathogènes. Le pH de la salive affecte également l'intégrité de la cavité buccale, d'où la susceptibilité aux caries.

**OBJECTIF:** L'étude a évalué et comparé la capacité antioxydante totale (TAC) et le pH de la salive chez les enfants avec et sans CPE.

**METHODES :** Salive entière non stimulée, en utilisant la méthode de la bave passive a été obtenue auprès d'enfants avec et sans CPE, appariés en fonction de l'âge et du sexe. Les échantillons ont été analysés pour le TAC à l'aide de la technique de dosage du phosphomolybdène et le pH avec un pH-mètre numérique portable.

Les données ont été analysées à l'aide du paquet statistique pour les sciences sociales (SPSS) version 21.

L'association entre les variables catégorielles a été déterminée à l'aide du chi carré, tandis qu'une analyse de variance (ANOVA) a été utilisée pour comparer les moyennes. Le niveau de signification (valeur p) a été fixé à 5 % (0,05)

**RESULTATS :** Un total de 68 enfants ont été examinés. (34 avec ECC et 34 sans ECC). Le TAC moyen dans le groupe ECC était de (0,53 ± 0,2), ce qui était supérieur au TAC moyen de (0,36 ± 0,1) dans le groupe sans ECC. Le pH moyen (6,17 ± 0,5) dans le groupe ECC était inférieur au pH moyen (6,74 ± 0,5) dans le groupe sans carie. La différence était statistiquement significative, valeur p < 0,001.

**CONCLUSION :** Les échantillons de salive des enfants atteints de CPE contenaient un TAC moyen plus élevé et des valeurs de pH plus faibles par rapport à ceux sans TAC, qui avaient un TAC moyen plus faible et des valeurs de pH plus élevées. Ceci suggère une relation entre la production d'antioxydants et la cariogenèse. Il existait une corrélation positive statistiquement significative entre le TAC et le pH de la salive chez les enfants atteints de CPE. **WAJM 2024; 41 (5): 524 - 533**

**MOTS CLES:** Carie de la petite enfance (CPE), Salive, pH, Capacité antioxydante totale (TAC)

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**Abbreviations:** ECC: Early Childhood Caries; TAC: Total Antioxidant Capacity; S-ECC: Severe Early Childhood Caries; FR: Free Radical; DMFT: Decayed Missing and Filled Teeth; LUTH: Lagos University Teaching Hospital.