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Influence of non-orthodontic intervention on digit sucking and consequent anterior open bite

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Some appliances have been developed in order to correct children's digit sucking habits simultaneously with or only for malocclusions resulting from these habits. Although the appliances above were effective in cessation of digit sucking, correction of anterior open bite, or both concurrently, these management options were costly and required advanced techniques. Previous studies have reported reductions in orthodontic relapse with the aid of orofacial myofunctional therapy. Stabilization of the tongue position was one of the reasons for a decrease in overbite relapse, since the stimulus of the tongue on the maxillary dental arch had a protective effect against the development of a cross-bite. When in a normal rest position, the tongue tip rests over the incisive papilla which is pear-shaped anatomical landmark located on the palatal mucosa posterior to the maxillary central incisors. This structure is relevant to rhythmic activity of the tongue muscles and guidance of tongue elevation. An earlier paper suggested that tongue thrusting patients should regularly place the tongue tip on the palatal rugae behind the upper central incisors, in order to improve the condition. A non-orthodontic intervention (NOI) comprising of guidance of the tongue position and behavior shaping with positive reinforcement was therefore developed. To guide the tongue to a correct rest position, a small round piece of gelatin material (stomahesive wafer) was placed onto the palate. Patients were then instructed to touch the spot of stomahesive wafer with the tongue tip. This helped to elevate the tongue in the correct rest position and encourage a lip seal. This less expensive and reduced technique-oriented approach has been used in clinical practice by some oro-facial myologists. My recent study with a team of dentists and oro-facial mycologists used the NOI method on a sample of 4- to 12-year-old children in Australia. After four months' implementation of the NOI method, 90% of children ceased the digit sucking habit. The number of anterior open bite cases also reduced by two thirds. In addition, children with a measurable over jet showed a decreased over-jet. Although the NOI method would require long-term follow up to observe relapse of the digit sucking habit and consequent malocclusion, the significant effect from this approach indicates future implementation in conjunction with orthodontic treatment.

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Study of the population genetic structure and demographic history of *Streptococcus mutans*

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Objectives: To analyze the genetic structure of *Streptococcus mutans*, through the use of sequences of strains from Argentina, Japan, Thailand and Finland and estimate the demographic history of the bacteria through Bayesian analysis.

Methods: Forty strains of *S. mutans* were recovered from stimulated saliva of children of Córdoba-Argentina. This work was approved by the Ethics Committee. Of each strain, DNA was extracted and we sequenced the genes aroE, lepC, gyrA and gltA. Sequences from Cordoba-Argentina were aligned with those of strains from Japan (n=89), Thailand (n=52) and Finland (n=12). The total DNA matrix consisted of sequences of 193 strains. Statistical analyzes were performed to determine whether there was evidence of clonality or of recombination in the genes of *S. mutans*. The pairwise FST between countries was estimated and we performed the Bayesian Skyline Plot and Extended Bayesian Skyline Plot analyses to estimate changes in the effective population size in the last 15,000 years.

Results: We detected high allelic diversity (137 alleles) and very low nucleotide diversity; only 12 were shared by two or more countries. The FST values between countries were significant. Of the statistical analyses performed, eight supported the existence of recombination. We detected inter-gene recombination and absence of this mechanism at the intra-gen level. A marked increase in the effective population size was detected approximately 7500 and 5000 years, according to the Bayesian Skyline Plot and Extended Bayesian Skyline Plot analyses, respectively.

Conclusion: *S. mutans* present a recombinant type population genetic structure. The demographic analyses support the hypothesis that the bacteria experimented a population expansion in the last 10000 years.

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