

Measuring the Relationship between *Streptococcus mutans* Levels and Dental Caries Severity in Patients at the MSSU Dental Hygiene Clinic

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Bacteria living in the mouth, such as *Streptococcus mutans*, can break down sugars to form dental plaque and contribute to dental caries, or tooth decay. Consensus has not yet been reached regarding how strongly *S. mutans* contributes to dental caries: some scientists reason that *S. mutans* is the major contributor to this disease, while others claim that other bacterial species may be more significant contributors. Therefore, this study was conducted to determine if there was a correlation between the *S. mutans* concentration and the plaque index in 24 patients at the MSSU Dental Hygiene Clinic. *S. mutans* DNA was extracted from each dental plaque sample. A quantitative PCR assay was used to measure levels of *dexA*, a *S. mutans* gene coding for dextranase, which breaks down sugars in plaque. The concentration of *dexA* correlated with the concentration of *S. mutans* in each sample. There was no correlation between the *S. mutans* level and the plaque index. The *dexA* levels varied considerably among patients having the same plaque index.

It is important to note that *S. mutans* is capable of contributing to dental caries in most people. *S. mutans* uses several mechanisms to survive well in the harsh acidic environment of the mouth. It can produce chemicals called mutacins to kill other bacteria in the mouth, thereby reducing their chances of breaking down sugars to cause dental caries. *S. mutans* is found in most people. However, *S. mutans* varies in concentration from person to person. Each person has a unique combination of bacterial species. *S. mutans* has a bigger impact in people who eat excessive sugar and who naturally have high *S. mutans* levels. Furthermore, several bacterial species have recently been shown to contribute to dental caries, such as *Streptococcus milleri* and *Streptococcus mitis*. It is possible that some participants with severe dental caries had low levels of *S. mutans*, but high levels of these other species. Therefore, other bacterial species may have contributed more strongly to dental caries in this sample, than did *S. mutans*.

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