CARIES ACTIVITY OF MUTANS STREPTOCOCCI IN PLAQUE ON THE MARGIN OF AMALGAM, ON ENAMEL AND ON THE SURFACE OF AMALGAM RESTORATION.

Soherwin Mangundjaja, E.I Auerkari
Department of Oral Biology Faculty of Dentistry Universitas Indonesia.

Abstract
Acidogenic microorganisms are very numerous in human dental plaque and caries. It is always associated with plaque which is far out number the mutans streptococci. Objectives: The aim of the study was to evaluate caries activity of mutans streptococci in plaque to produce acid on the margin of restoration, compared with those on the enamel and on the surface of amalgam restoration. It assumed that caries activity of mutans streptococci on the margin has tended to influence the presence of secondary caries. Method: In this study the first molars of 20 patients were treated with amalgam restoration. The results of caries activity mutans streptococci was measured using Cariostat (Tzu Shimono, 1981). Results: showed that caries activity on the enamel and on the surface of amalgam restoration tend to pH 5.4 (40.00% and 74.36%), on the other hand the caries activity on the margin tends to pH 5.4 (41.36%) and pH 4.0 (36.69%). Conclusion: It can be concluded therefore that the prediction caries activity of mutans streptococci in plaque on the margin is higher compared with those on the enamel and on the surface of amalgam restoration.

Key words: Caries activity- Mutans streptococci – Amalgam restoration

Introduction

The mutans streptococci have two properties acidogenicity and aciduricity. They are considered the most cariogenic group within the oral micro-flora Streptococcus mutans and Streptococcus sobrinus are commonly found species in human dental plaque (Bratthall, 1972; Carlsson, 1980). In epidemiological study, the presence Streptococcus mutans is associated with high number of salivary mutans streptococci, and caries activity of mutans streptococci in high caries prevalence Caries is a site specific disease, for indicator of future risk for new lesions is Streptococcus mutans in plaque for predicting caries activity at the area of the restoration. Caries activity of mutans streptococci determined by using colorimetric
may show some discrepancies, but this colorimetric (Cariostat) showed correlation with the ability of mutans streptococci produced acid in the margin of amalgam, enamel and the surface of the amalgam restoration.

**Objective**

To determine the caries activity of mutans streptococci in plaque to produce acid on the margin of amalgam, on the enamel and on the surface of the amalgam restoration.

**Material and Methods**

Twenty patients were treated with amalgam restoration at the lower first molars participated in the study.

**Bacterial sampling and bacteriological procedures**

**Samples collection:**

Plaque samples were collected using a 1.5 mm excavator to scrape one way direction from enamel, along the border between the enamel and amalgam restoration and the surface of the amalgam restoration and suspended by shaking in a vial of 2 ml semi synthetic medium of Cariostat⁴. Plaque samples were incubated in anaerobic jar filled with 95 % N2 and 5 % CO₂ at 37 Celsius for 72 hours. After incubating the color of the test tubes will change and comparing with the control sample with standard test liquid for color sample use preliminary prepared by changing pH. Estimating by making classification into 4 grades:

- Grade I = Blue pH = 7.2
- Grade 2 = + Green pH 5.4
- Grade 3 = ++ Yellow-green pH 4.7
- Grade 4 = +++ Yellow pH 4.0.

The data were analyzed using percentages based on grades changing pH of Cariostat.
### Results:

Table. The determination of caries activity level on the enamel and on the surface of amalgam restoration

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grade 1</th>
<th>Grade 2</th>
<th>Grade 3</th>
<th>Grade 4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enamel</td>
<td>3</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>(15.00%)</td>
<td>(40.00%)</td>
<td>(25.00%)</td>
<td>(20.00%)</td>
<td></td>
</tr>
<tr>
<td>Margin</td>
<td>1</td>
<td>9</td>
<td>2</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>(5.00%)</td>
<td>(41.36%)</td>
<td>(10.52%)</td>
<td>(36.64%)</td>
<td></td>
</tr>
<tr>
<td>Surface</td>
<td>3</td>
<td>14</td>
<td>2</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>(15.00%)</td>
<td>(74.36%)</td>
<td>(10.00%)</td>
<td>(0.00%)</td>
<td></td>
</tr>
</tbody>
</table>

The result showed that caries activity of mutans streptococci in plaque, on the enamel and on the surface of amalgam restoration have grade 2, pH 5.4 (40.00 % and 75.00 %) caries activity. It showed that on the margin of amalgam the highest proportion have grade 2 pH 5.4 (45.00 %) and grade 4 pH 4.0 (40.00 %) caries activity.

### Discussion

The percentage of caries activity of streptococci in plaque of the lower first molars widely among on the margin of amalgam, on the enamel the surface of the amalgam restoration

In the present study of caries activity measured only indicating acid produced by mutans streptococci in the differences site of the tooth. Caries activity of mutans streptococci on the margin of restoration showed highest level of acid produced it is early interpreted as caries indicator for caries existence on this site.

Early finding which have shown that levels of mutans streptococci in plaque from margin of Amalgam, Composite and Glass-ionomer restorations were high and caries activity of mutans streptococci showed different level among the people of Kelapa Island Indonesia.
The present finding that caries activity and levels of mutans streptococci from the margin of amalgam have the same proportion but it was difficult to predict as indicator for secondary caries along the margin of amalgam restoration. It was known that caries activity and caries risk went together to measure the caries.

This study is to obtain a picture that caries activity of mutans streptococci in plaque of the teeth occurred. difference acid formation.

**Conclusion**

Caries activity of mutans streptococci on the margin of amalgam restoration is higher compared with on the enamel and on the surface of amalgam restoration.

The finding that caries activity of mutans streptococci in plaque on those sites of the first lower molar showed estimating of acid production with differences level of pH. It could not be for predicting of a new lesion.

**Suggestion**

Marginal gap between enamel and amalgam restoration should be early diagnosed as caries, because of explorer tug back of microorganism. It could be a potential pathways for re-infection.

**References**

   Presented at the Asian Pacific Dental Association Congress.
   Kuala Lumpur Malaysia 1993.
   Presented at The FDI Conference, October 1995 Hongkong.


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