Caries Status of Northern Plains Tribal Community Children – the SMILEs Study

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The SMILEs Study

- A prospective cohort study, part of a collaboration between the University of Iowa and a Northern Plains tribal community.
- The study’s overriding aim was to investigate the relationship between oral bacteria and early childhood caries.
Methods

- Expectant mothers and mothers with newborns were recruited from the tribal community during 2009-2010.
- Children enrolled into the study at 1 month of age. At this baseline visit:
  - Plaque samples were taken from each child and mother.
  - Mothers completed questionnaires about dietary practices, family demographics and other factors.
  - Mothers completed a dental examination.
Methods

- Follow-up visits were completed when the children were approximately 4, 8, 12, 16, 22, 28 and 36 months of age (±30 days).
- Dental caries examinations of children were done at each visit beginning as soon as any teeth were present.
- All dental examinations were conducted by one of four dental hygienists:
  - They were formally trained by a gold-standard examiner and calibrated with each other.
  - Pairwise kappa values for the examiners ranged from 0.90 to 0.94.
Methods

- Surface specific dental caries examinations were made for all study participants using the standard dmfs criteria adapted from those used in NHANES.
- Exams were completed using a halogen headlight, a DenLite® illuminated mirror.
- The teeth were dried with gauze and visually inspected.
- Non-cavitated “white spot” lesions were assessed on a person basis.
# Results

## Caries Prevalence and Mean dmfs by Age

<table>
<thead>
<tr>
<th></th>
<th>8 months (n=233)</th>
<th>12 months (n=235)</th>
<th>16 months (n=233)</th>
<th>22 months (n=234)</th>
<th>28 months (n=227)</th>
<th>36 months (n=232)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Children with caries</td>
<td>5</td>
<td>35</td>
<td>74</td>
<td>116</td>
<td>157</td>
<td>186</td>
</tr>
<tr>
<td>Prevalence</td>
<td>2.1%</td>
<td>14.9%</td>
<td>31.8%</td>
<td>49.6%</td>
<td>69.2%</td>
<td>80.2%</td>
</tr>
<tr>
<td>Mean dmfs</td>
<td>0.03</td>
<td>0.51</td>
<td>1.45</td>
<td>3.66</td>
<td>7.00</td>
<td>9.62</td>
</tr>
</tbody>
</table>
Other Study Data at 36 Months

- The dmfs distribution was 61.7% decayed, 31.4% missing and 6.9% filled.
- Prevalence was slightly higher in boys (83.5%) than in girls (77.5%), but this difference was not statistically significant (p=0.32).
- The mean dmfs was 9.62, and was slightly higher in girls (9.75) than in boys (9.46), but this difference was not statistically significant (p=0.86). Individual dmfs values ranged from 0 to 42 surfaces.
- The mean number of erupted surfaces present was 87.74, so that the proportion of all surfaces with dmf was 10.96%.
Caries Location – Tooth Specific Prevalence

Figure 1. Proportion of Maxillary Teeth with dmf Caries

Figure 2. Proportion of Mandibular Teeth with dmf Caries
Logistic Regression: Factors Related to dmf Caries Experience at 36 months

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Age</td>
<td>0.931</td>
<td>0.871 - 0.996</td>
<td>0.0381</td>
</tr>
<tr>
<td>Maternal DMFS</td>
<td>1.045</td>
<td>1.018 - 1.072</td>
<td>0.0008</td>
</tr>
<tr>
<td>Household Size</td>
<td>1.291</td>
<td>1.091 - 1.526</td>
<td>0.0029</td>
</tr>
<tr>
<td>Added Sugar Beverage Intake as a Proportion of Total</td>
<td>1.022</td>
<td>1.004 - 1.041</td>
<td>0.0175</td>
</tr>
</tbody>
</table>

Added sugar beverages included juice drinks, flavored water, sugared drinks from powder (e.g., Kool Aid), regular soda pop, sports drinks, energy drinks, other sugared drinks (e.g., lemonade or sweet tea)
A couple of final points........

- Negative binomial regression on the extent of caries - dmfs counts - revealed only maternal DMFS to be related to child dmfs (i.e., no other factors were significant predictors of dmfs)
- When we included non-cavitated (“white spot”) lesions, overall caries prevalence was 95%
Questions?