ERUPTION OF DECIDUOUS TEETH IN AMERICAN INDIAN CHILDREN: A HISTORICAL COMPARISON

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Challenges in the study of deciduous tooth eruption

- Often not the primary focus of research

- Studies frequently start after tooth eruption begins
  - Early Childhood Caries – how early?

- Of interest because of the possibility that longer exposure may lead to greater levels of decay in young children.
Sample population

- Northern Plains tribe
- 228 children from eligible 239
- Hygienist and interviewer visited families at 4 month intervals after baseline:
  - 1 month (mean = 0.93, SD = 0.81)
  - 4 months (mean = 3.88, SD = 0.58)
  - 8 months (mean = 7.85, SD = 0.63)
  - 12 months (mean = 11.64, SD = 0.40)
  - 16 months (mean = 15.42, SD = 0.40)
Measuring eruption: 3 common approaches

- Age at first tooth
- Counts of teeth at different time points (or ages)
- Patterns of tooth eruption
Measurement considerations

- Current study design
  - Longitudinal follow-up
  - Eruption documented by trained hygienists
  - Visits at four-month intervals
  - Data collected as status at time of visit: exact times of tooth eruption not recorded
  - Missed visits = missing data
Timing of 1st tooth eruption

<table>
<thead>
<tr>
<th>1st tooth erupted before</th>
<th>frequency</th>
<th>percent</th>
<th>cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 month</td>
<td>4</td>
<td>1.75</td>
<td>1.75</td>
</tr>
<tr>
<td>4 months</td>
<td>33</td>
<td>14.47</td>
<td>16.22</td>
</tr>
<tr>
<td>8 months</td>
<td>163</td>
<td>71.49</td>
<td>87.71</td>
</tr>
<tr>
<td>12 months</td>
<td>27</td>
<td>11.84</td>
<td>99.55</td>
</tr>
<tr>
<td>16 months</td>
<td>1</td>
<td>0.45</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Historical comparison of timing of first tooth eruption

Drake 2012

- American Indian 2012
- African American 1957
- Sweden 1976
- US white 1942
- US white 1957
- Saudi Arabia 1996
- Bangladesh 1978
Numbers of teeth in current study

<table>
<thead>
<tr>
<th>Visits</th>
<th>N</th>
<th>mean</th>
<th>SD</th>
<th>median</th>
<th>25th, 75th</th>
<th>min, max</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 month</td>
<td>228</td>
<td>0.03</td>
<td>0.24</td>
<td>0</td>
<td>0, 0</td>
<td>0, 2</td>
</tr>
<tr>
<td>4 months</td>
<td>227</td>
<td>0.30</td>
<td>0.70</td>
<td>0</td>
<td>0, 0</td>
<td>0, 3</td>
</tr>
<tr>
<td>8 months</td>
<td>228</td>
<td>3.56</td>
<td>2.50</td>
<td>2</td>
<td>2, 6</td>
<td>0, 8</td>
</tr>
<tr>
<td>12 months</td>
<td>227</td>
<td>7.73</td>
<td>2.36</td>
<td>8</td>
<td>7, 8</td>
<td>0, 16</td>
</tr>
<tr>
<td>16 months</td>
<td>224</td>
<td>12.46</td>
<td>3.41</td>
<td>12</td>
<td>10, 16</td>
<td>2, 20</td>
</tr>
</tbody>
</table>

Average number of teeth at 12 months – *American Indian mean significantly greater (p < 0.001, Student’s T-test) than the mean in each of the other populations.

<table>
<thead>
<tr>
<th></th>
<th>AI ('42)</th>
<th>W ('42)</th>
<th>W ('57)</th>
<th>AA ('57)</th>
<th>W ('64)</th>
<th>PNG ('64)</th>
<th>G ('68)</th>
<th>S ('76)</th>
<th>UK ('87)</th>
<th>F ('00)</th>
<th>B ('07)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>227</td>
<td>239</td>
<td>268</td>
<td>530</td>
<td>124</td>
<td>76</td>
<td>86</td>
<td>205</td>
<td>239</td>
<td>129</td>
<td>359</td>
</tr>
<tr>
<td>mean</td>
<td>7.7*</td>
<td>6.1</td>
<td>5.8</td>
<td>6.0</td>
<td>6.7</td>
<td>5.2</td>
<td>4.5</td>
<td>6.1</td>
<td>6.2</td>
<td>6.1</td>
<td>5.5</td>
</tr>
<tr>
<td>SD</td>
<td>2.4</td>
<td>2.2</td>
<td>2.1</td>
<td>2.7</td>
<td>2.3</td>
<td>0.3</td>
<td>2.5</td>
<td>2.2</td>
<td>2.5</td>
<td>2.4</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Comparing Patterns of Eruption: 1 or 3 months

**Current study: 1 month, N=228**

**US whites: 3 months\(^3\), N=270**

**Korea: 1 month\(^1\), N=1141**

**Papua New Guinea: 1 month\(^2\), N=239**
Comparing Patterns of Eruption: 4 or 6 months

Current study: 4 months, N=228

Korea: 4 months\textsuperscript{13,14}, N=2211

US whites: 6 months\textsuperscript{3}, N=270

Papua New Guinea: 4 months\textsuperscript{12}, N=239
Comparing Patterns of Eruption:
8 or 9 months

Current study: 8 months, N=228

US whites: 9 months\textsuperscript{3}, N=263

Korea: 8 months\textsuperscript{13,14}, N=2211

Papua New Guinea: 8 months\textsuperscript{12}, N=239

<table>
<thead>
<tr>
<th>Light blue</th>
<th>&gt;0-25% have teeth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slate blue</td>
<td>&gt;25-50% have teeth</td>
</tr>
<tr>
<td>Medium blue</td>
<td>&gt;50-75% have teeth</td>
</tr>
<tr>
<td>Dark blue</td>
<td>&gt;75-100% have teeth</td>
</tr>
</tbody>
</table>
Comparing Patterns of Eruption: 12 months

Current study: 12 months, N=228

US whites: 12 months\(^3\), N=268

Korea: 12 months\(^{13,14}\), N=2211

Papua New Guinea: 12 months\(^{12}\), N=239

Light blue: >0-25% have teeth
Slate blue: >25-50% have teeth
Medium blue: >50-75% have teeth
Dark blue: >75-100% have teeth
Comparing Patterns of Eruption: 16 or 18 months

Current study: 16 months, N=228

US whites: 16 months\(^3\), N=241

Korea: 16 months\(^{13,14}\), N=2211

Papua New Guinea: 16 months\(^{12}\), N=239

Legend:
- Light blue: >0-25% have teeth
- Slate blue: >25-50% have teeth
- Medium blue: >50-75% have teeth
- Dark blue: >75-100% have teeth
Conclusions

- These comparisons suggest that the time to first tooth eruption is earlier in this American Indian population.

- Comparisons with available data demonstrated that the mean number of teeth erupted at 12 months in this population was greater than in 10 other populations.

- Patterns of tooth eruption appeared to differ in this population, notably with respect to earlier timing and canine eruption.

- Hypothesis for future investigation: Is greater exposure (i.e. early eruption) associated with increased risk of early childhood caries?
References


