Pre-school Child Oral Health
in a Rural Chilean Community

Salud Bucal en Niños Pre-escolares de una Zona Rural Chilena

César Andrés Rivera Martínez


**ABSTRACT:** Caries and gingivitis are the most prevalent diseases in Chile. The aim of this study is to determine the damage of oral health in children ages 4 and 5 years, in Peralillo, Chile, prior to the start of oral health program promoted by JUNAEB (Junta Nacional de Auxilio Escolar y Becas) in the commune. The sample consisted of 130 children, admitted to the student dental clinic between November 2010 and February 2011. Oral exam seeks to know presence of dental caries and number of teeth affected, using dmft index (decayed, missing and filled primary teeth), simplified oral hygiene index (OHI-S) and presence or absence of gingivitis. 49.2% of children had caries, with an dmft index 2.4 (S.D. ± 3.5). The OHI-S of the entire sample was 1.4 (S.D. ± 0.4). Gingivitis was reported in 9.2% of cases. The results of this investigation shows that following dental intervention, the goals set by FDI (FDI World Dental Federation) and WHO (World Health Organization) were obtained. Efforts are required in promotion and education in oral health, as well an increase in resources to attend these patients to decrease impact of oral diseases in the future.

**KEY WORDS:** caries, gingivitis, dmft index, OHI-S, children, Chile

**INTRODUCTION**

Oral diseases are the most common chronic diseases and constitute a major public health problem, because of their high prevalence, impact on individuals and society, also the cost involved in therapies (Sheiham, 2005).

In most rural localities, the population has little access to dental care and high rates of risk factors, such as poor diet and the absence of massive prevention and educational programs in oral health (Labranque & Vidal, 2001).

For dentistry, the great value of epidemiological studies in populations where there are not many precedents, is the possibility to estimate the oral health status of a given population and quantify the magnitude and severity of problems affecting it (Vicentela et al., 1993.)

To develop preventive measures, an epidemiological approach that includes an analysis for dental caries and periodontal disease is essential (Motohashi et al., 2009). Recent epidemiological information on caries experience prevalence among Chilean children is scarce (Villa et al., 1998).

Contrary to the situation among six and twelve-year-old Chilean children, few studies have been conducted to characterize the oral health of preschool children. Only one, as yet unpublished, national surveys are available comprising clinical data collected in 2007 (Ceballos et al., 2007; Soto et al., 2007).

These reports from the Chilean Health Ministry found that the prevalence of dental caries in children aged 2 and 4 years old was 83% and 52% respectively, and the dmft index (decayed, missing and filled teeth) was 1.5 and 2.4 for these age groups. The presence of gingivitis in these children groups was 2.6 and 6.2%. In those studies, the data were collected in an urban region.

Specifically to Chilean pre-school children rural populations, there are few published data that report the prevalence of oral diseases. The evidence shows a dmft index with values ranging from 2.1 to 3.18 and a percentage of children free from caries history from 43.2
to 50\% (Mariño et al., 2004; Oporto et al., 2008; Yévenes et al., 2009).

Therefore, the aim of this study was to contribute to the knowledge of the oral health of Chilean rural children, by estimating the prevalence of dental caries and gingivitis, considering that they are the most common oral diseases, prior to dental intervention by oral health program of JUNAEB (Junta Nacional de Auxilio Escolar y Becas) in Peralillo, Chile.

MATERIAL AND METHOD

A cross-sectional study design was used to conduct this investigation. All experimental protocols were approved by the community manager for student health (O.V.).

**Study population.** The study was carried out at the rural commune of Peralillo, an inland municipality some 205 km to the South of Santiago, the Chilean capital. The main economic activity in this geographic region is agriculture.

Data were collected from a simple random sample of 130 patients from 4 to 5 years-old, admitted to the student dental clinic between November 2010 and February 2011: 17 boys from age 4 years and 48 from 5 years; 21 girls from age 4 years and 44 from 5 years, respectively. Letters were sent to the parents and/or guardians of each child, requesting consent for dental examinations.

**Clinical examinations.** Each child was examined by only one dentist (C.R.) at the Peralillo students dental clinic. The oral examination was performed in dental office, teeth and gums were examined under artificial light using a clinical mirror. In this procedure we analyzed the presence of teeth number affected through dfm (decayed, missing and filled primary teeth) index using World Health Organization (WHO) criteria (WHO, 1997) and gingivitis presence/absence. The simplified oral hygiene index (Greene & Vermillion, 1964) was recorded. All patients and their parents and/or guardians received oral health education, and children with dental caries and gingivitis received treatment.

**Data Analysis.** Differences in caries experience and OHI-S by group of the study were tested using the Mann-Whitney U test. Gingivitis experience was analyzed using Chi-square statistic test (with Pearson correction) and Fisher's Exact Test. For all statistical tests, the level of statistical significance was set at $p \leq 0.05$.

RESULTS

Sex distribution shown 47 \% (61 individuals) of people were boys, and 53 \% (69 individuals) were girls.

<table>
<thead>
<tr>
<th>Age Group (years)</th>
<th>Caries affected</th>
<th>Caries free</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>(47.1%)</td>
<td>(52.4%)</td>
<td>(52.9%)</td>
</tr>
<tr>
<td>5</td>
<td>23</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>(52.3%)</td>
<td>(50%)</td>
<td>(47.7%)</td>
</tr>
<tr>
<td>4-5</td>
<td>66</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(49.2 %)</td>
<td>(50.8 %)</td>
<td></td>
</tr>
</tbody>
</table>

+Pearson’s Chi-Square

Table I. Dental caries by age and gender groups (cases and percent) in Peralillo children.

<table>
<thead>
<tr>
<th>Age Group (years)</th>
<th>dfm*</th>
<th>OHI-S*b</th>
<th>Gingivitis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>p-value*</td>
</tr>
<tr>
<td>4</td>
<td>1.5 ± 2.9</td>
<td>3.0 ± 3.6</td>
<td>0.6</td>
</tr>
<tr>
<td>5</td>
<td>2.0 ± 2.9</td>
<td>2.9 ± 4.0</td>
<td>0.9</td>
</tr>
<tr>
<td>4-5</td>
<td>2.4 ± 3.5</td>
<td>1.4 ± 4.0</td>
<td>1.2</td>
</tr>
</tbody>
</table>

aDecayed, missing and filled primary teeth index; bSimplified oral hygiene index; *Mann-Whitney U test; #Fisher’s Exact test; +Pearson’s Chi-Square
50.8% of children were free of caries versus 49.2% with caries. Table I shows that no significant differences when comparing age and gender. \((p \geq 0.05)\). Table II shows the analysis of the three indicators used in this study. On the entire sample, dmft index was 2.4 (S.D. ± 3.5), OHI-S was 1.4 (S.D. ± 0.4). The gingivitis was reported in 9.2% of cases. No statistically significant differences for dmft index, OHI-S, and gingivitis presence/absence, when comparing age and sex \((p \geq 0.05)\).

**DISCUSSION**

The overall prevalence of dental caries in the 4 to 5 years old children of Peralillo was 49.2%, which is consistent with the statistics reported in other Chilean studies.

In this sample, 50.8% of the children at 5 years of age were caries-free. These results are slightly lower than those reported by Ceballos et al. (Ministry of Health of Chile official data), which indicate that 51.98% of children of 4 years old show no history of caries. With regard to the damage history of caries in deciduous teeth at that age, the same report notes the mean of dmft index was 2.32 (S.D. ± 3.27), similar to that found in this report.

At 5 years of age it indicates that 48.9% of children have caries, these numbers are lower than those reported by Yévenes et al. indicating a 69.9% in urban-rural population. The dmft index for children 5 years of age reported by Yévenes et al., was 2.5 (S.D. ± 3.5), similar to this report. In a population similar to that of this research, Oporto et al. reported that the dmft index for ages 4 and 5 years was 3.5 (S.D. ± 3.7), numbers above Peralillo indicators.

The presence of gingivitis in this study was 9.2%, while the report of the Ministry of Health of Chile reported that 6.2% of children 4 years old have this disease.

It is interesting when is analyzed based on FDI/WHO proposed for the year 2000, that 50% of children at 5 years of age should be caries free (Fédération Dentaire Internationale, 1982). These organizations also proposed as a goal for the year 2020, children under 12 years there was a prevalence of dental caries in three teeth (Hobdell et al., 2003). Considering all studied individuals, objectives were accomplished. The findings of this small sample (130 children) might be representative for this commune and for others with similar characteristics, but may not be applicable to the entire country.

The results of this investigation shows that after dental intervention, reach the goals set imposed by FDI/WHO. Efforts are required in promotion and education in oral health, as well as increase resources to treat these patients to decrease impact of oral diseases in the future.

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REFERENCES


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