

Pre-school Child Oral Health in a Rural Chilean Community

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

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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. \pm 3.5). The OHI-S of the entire sample was 1.4 (S.D. \pm 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 dmtf (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 I. Dental caries by age and gender groups (cases and percent) in Peralillo children.

Age Group (years)	Caries affected		Caries free		p-value
	Boys	Girls	Boys	Girls	
4	8 (47.1%)	11 (52.4%)	9 (52.9%)	10 (47.6%)	0,7 ⁺
5	23 (52.3%)	24 (50%)	21 (47.7%)	24 (50%)	0,8 ⁺
4-5	66 (49.2 %)		64 (50.8 %)		

+Pearson's Chi-Square

Table II. dmtf and OHI-S index (mean \pm SD) and Gingivitis (cases number and percent) distribution in studied population.

Age Group (years)	dmtf ^a			OHI-S ^b			Gingivitis		
	Boys	Girls	p-value*	Boys	Girls	p-value*	Boys	Girls	p-value
4	1.5 \pm 2.9	3.0 \pm 3.6	0.6	1.3 \pm 0.4	1.5 \pm 0.3	0,6	0	2 (9.5%)	0,5 [#]
5	2,0 \pm 2.9	2.9 \pm 4.0	0.9	1.3 \pm 0.5	1.4 \pm 0.4	0,3	4 (9%)	6 (12.5%)	0,6 ⁺
4-5	2.4 \pm 3.5			1.4 \pm 0.4			12 (9,2%)		

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. \pm 3.5), OHI-S was 1.4 (S.D. \pm 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. \pm 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. \pm 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. \pm 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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RESUMEN: La caries y gingivitis son las enfermedades más prevalentes en Chile. El objetivo de este estudio es determinar el compromiso de salud bucal en niños de 4 y 5 años, en Peralillo, Chile; antes del inicio del programa de salud bucal impulsado por JUNAEB (Junta Nacional de Auxilio Escolar y Becas) en esta comuna. La muestra consistió en 130 niños, ingresados en la clínica dental del estudiante entre Noviembre de 2010 y Febrero de 2011. Se realizó un examen oral para conocer el número de dientes afectados por caries, usando el índice ceod (dientes temporales con caries, perdidos y restaurados), índice de higiene oral simplificado (IHO-S) y la presencia o ausencia de gingivitis. El 49,2% de los niños presentó caries, con un índice ceo de 2,4 (D.E. \pm 3,5). El IHO-S para la muestra completa fue 1,4 (D.E. \pm 0,4). La gingivitis se reportó en el 9,2% de los casos. Los resultados muestran que antes de la intervención odontológica, se alcanzan las metas fijadas por la FDI (Federación Dental Internacional) y OMS (Organización Mundial de la Salud). Se requieren esfuerzos en educación y promoción de la salud bucal, así como aumentar recursos para atender estos pacientes con el fin de disminuir el impacto de las enfermedades orales en el futuro.

PALABRAS CLAVE: caries, gingivitis, ceo, IHO-S, niños, Chile.

REFERENCES

- Ceballos, M.; Acevedo, C.; Corsini, G.; Jans, A. *Diagnóstico de Salud Bucal de Niños de 2 y 4 años, que asisten a la educación preescolar en la Región Metropolitana*. Santiago, Gobierno de Chile, Ministerio de Salud, 2007.
- Fédération Dentaire Internationale. Goals for the oral health in the year 2000. Fédération Dentaire Internationale. *Int. Dent. J.*, 32:74-7, 1982.
- Greene, J. & Vermillion, J. The simplified oral hygiene index. *J. Amer. Dent. Assoc.*, 68:7-13, 1964.
- Hobdell M, Petersen PE, Clarkson J, Johnson N. Global goals for oral health 2020. *Int. Dent. J. Oct*;53(5):285-8, 2003.
- Labranque, R.; Vidal, H. Estudio comparativo de salud oral, en una población escolar rural de la VI Región. *Rev. Dental de Chile*, 92 (1):13-6, 2001.
- Mariño, R.; Villa, A.; Weitz, A. & Guerrero, S. Caries prevalence in a rural Chilean community after cessation of a powdered milk fluoridation program. *J. Public Health Dent.*, 64(2):101-5, 2004.
- Motohashi, M.; Nakajima, I.; Aboshi, H.; Honda, K.; Yanagisawa, M.; Miyata, T.; Maeno, M.; Kuwata, F.; Sidaphone, B.; Ngonephady, S.; Sitthiphanh, A.; Kingsada, S. & Otsuka, K. The oral health of children in a rural area of the Lao People's Democratic Republic. *J. Oral Sci.*, 51(1):131-5, 2009.
- Oporto, G.; Bertrán, C.; Santana, R.; Gamboa, C.; Hernández, S. & Alister, J. Oral health conditions in preschool children during preventive dental check up. *Int. J. Odontostomat.*, 2(2):137-41, 2008.
- Sheiham, A. Oral health, general health and quality of life. *Bull. World Health Organ.*, 83(9):644, 2005.
- Soto, L.; Tapia, R.; Jara, G. & Rodríguez, G. *Diagnóstico Nacional de Salud Bucal del Niño de 6 años*. Santiago, Gobierno de Chile, Ministerio de Salud, 2007.
- Vicentela, L.; Vargas, L.; Oliva, C.; Parra, J. & Lagos, O. Estado dentario de los escolares de las comunidades pehuenches de Ralco y Ralco Lepoy. Santa Bárbara. VIII Región del Bío Bío. *Rev. Dental de Chile*, 84(1):21-8, 1993.
- Villa, A. E.; Guerrero, S. & Villalobos, J. Estimation of optimal concentration of fluoride in drinking water under conditions prevailing in Chile. *Community Dent. Oral Epidemiol.*, 26:249-55, 1998.
- Yévenes, I.; Campos, B.; Apip, A.; Mozfeld, R.; Neira, M. & Petrasic, L. Prevalence of dental caries in preschool children in Peñaflor, Santiago, Chile. *Rev. Odonto. Ciênc.*, 24(2):116-9, 2009.
- World Health Organization. *Oral health surveys: Basic methods*. 4th ed. Geneva, WHO, 1997.

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