

A Critical Review of Dental Caries in Individuals with Cleft Lip

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ABSTRACT

Introduction: People with cleft lip and palate (CLP) often have problems with oral hygiene due to the difficulty of obtaining appropriate mechanical biofilm control.

Objectives: To review the literature and to seek an epidemiological profile of dental caries in individuals with CLP.

Materials and methods: In the PubMed database and Web of Knowledge, using the keywords 'dental caries' and 'cleft lip,' 58 studies were collected, of which 13 were selected. After collection of the epidemiological data of dental caries from each paper, the age of the study subjects, the severity of dental caries (DMFT/dmft), and kappa statistics were gathered.

Results: The cross-sectional studies totaled four papers, and there were nine case-control studies; six of them showed a more severe caries index in the case group (CLP), two studies showed the control group (without CLP) having higher caries severity, and one only paper with one age (14 years) indicated higher severity in the control group.

Conclusion: Overall, the rate of dental decay found in individuals with CLP was higher than among people without this condition in the studies evaluated.

Keywords: Dental caries, Cleft lip, Epidemiology.

How to cite this article: Pinto ECH, Pinto EG, Soares S, Oliveira TM, Almeida ALPF, Bastos JRM, Bastos RS. A Critical Review of Dental Caries in Individuals with Cleft Lip. *World J Dent* 2013;4(4):272-275.

Source of support: Nil

Conflict of interest: None declared

INTRODUCTION

An epidemiology study aims to investigate the frequency and distribution of diseases and health problems in a population as well as their biological and social determinants of health. That is why it becomes possible to plan actions aimed to prevent and control the health problems of population groups. Based on this concept, tooth decay has been combated; however, it is still an important public health problem and the main threat to the oral health of children and, consequently, to adults.¹

The cleft lip and palate (CLP) comprise a group of craniofacial malformations with an incidence of about one in every 500 to 1,000 births worldwide.^{2,3} These individuals often present poor oral hygiene due to the difficulty of obtaining proper dental biofilm control associated with dental anomalies.⁴ Many authors³⁻¹⁵ have reported the prevalence of dental caries in individuals with CLP, taking

into account the implications that these malformations may contribute to the incidence of the disease, perhaps due to the difficulty of cleaning and to the lack of guidance and oral histophysiology. Because CLP anomalies have low incidence in any population, few studies have shown the relationship between oral diseases and this congenital condition. This study aimed to perform a review of the literature to identify the dental caries epidemiology profile in individuals with CLP.

MATERIALS AND METHODS

To carry out this literature review, the PubMed database and Web of Knowledge were carried out using keywords registered in Health Sciences Descriptors (DeCs), dental caries and cleft lip, which yielded 58 papers. Of these, 18 journal articles were selected and 13 met the inclusion criteria.

The inclusion criteria adopted were articles containing epidemiological studies with data on the prevalence or incidence of dental caries. The articles excluded were not presenting the control group in case-control studies, used no dental caries index or did not mention the age of the volunteer participants.

Some epidemiologic indicators were collected in this literature review and organized by dental caries data for individuals with CLP in each article. Therefore, the information collected included the geographic location (country), epidemiological design, index criterion, population studied, age of each group and kappa statistics. The odds ratio analyses are not present because the great majority of the authors did not present this important measure.

RESULTS

The cross-sectional studies amounted four papers, and there were six case-control studies; six of them showed a more severe caries index in the case group (CLP), two studies showed the control group (without CLP) having higher caries severity, and one only paper with one age (14 years) showed higher severity in the control group (Table 1). All of the case-control studies presented statistical analyses except for the research conducted by Lucas et al (2000), where other oral health indicators were used to present statistical analyses.

Table 1: Resume of the epidemiologic dental caries data on CLP studies

First author, year	Ref.	Country	Design	Kappa	N cases	N control	Age	Case		Control	
								DMFT	dmft	DMFT	dmft
Britton KF, 2010	10	Scotland	Cross-sectional	—	209	—	0.5-1.49	—	0	—	—
							1.5-2.49	—	0.49	—	—
							2.5-3.49	—	1.03	—	—
							3.5-4.49	—	0.93	—	—
							4.5-6.0	—	3.24	—	—
Stec-Slonicz M, 2007	6	Germany Poland	Cross-sectional	—	100		Germany 6-12	1.6	1.6	—	—
							Germany 13-18	3.2	0.83	—	—
							Poland 6-12	4.1	3.27	—	—
							Poland 13-18	7.1	0.0	—	—
Besseling S, 2004	16	Vietnam	Cross-sectional	0.96	154	—	4-6	—	11.20	—	—
							11-13	5.06	—	—	—
							14-16	7.07	—	—	—
Lages EMB, 2004	14	Brazil	Cross-sectional	0.98	78	—	1-5	—	2.91	—	—
							6-12	1.87	2.77	—	—
							13-18	6.46	—	—	—
							19-32	13.62	—	—	—
Freitas AB, 2012	17	Brazil	Case-control	0.87	30	30	12-21	8.2	—	7.17	—
Tannure PN, 2012	3	Brazil	Case-control	—	115		4-21	1.2***	1.68	0.90***	2.61
Hazza'a AM, 2011	8	Jordan	Case-control	0.94	98	98	4-8	0.4	4.52	0.3	1.44
							8-12***	1.68	3.85	0.95	2.05
							12 or more***	7.36	—	3.52	—
Zhu WC, 2010	5	China	Case-control	0.95	380	339	3-5		2.53		1.92
							6-12	4.24		3.11	
							13-25**	2.44		1.39	
Al-Dajani M, 2009	7	Syria	Case-control	—	53	53	12-29**	6.83	—	3.81	—
Parapanisiou V, 2009	18	Greek	Case-control	—	41	41	4-18****	2.61	3.00	1.25	4.16
Ahluwalia M, 2004	9	England	Case-control	—	81	61	6-16*	1.56	2.38	0.48	0.62
							6*	0.21	4.0	0.06	2.05
							7*	0.84	5.16	0.20	2.42
							8*	0.51	4.47	0.35	2.64
							9*	1.32	3.38	0.62	2.50
							10*	1.37	—	0.86	—
							11*	1.88	—	1.14	—
							12*	3.09	—	1.54	—
							13	2.84	—	2.11	—
							14	2.51	—	2.60	—
Kirchberg A, 2004	13	Germany	Case-control	—	623	47.646	15*	4.31	—	3.16	—
							16	5.61	—	3.84	—
							3-15	1.18	2.35	1.48	2.93

*p < 0.05 (Mann-Whitney test); **p < 0.01 (Wilcoxon test); ***p < 0.05 (t-test); ****p-value absent

DISCUSSION

Currently, dental caries is still the main prevalent oral disease in the world, and the methods of control and prevention are known. However, individuals with CLP, according to the studies listed in this study, present a higher incidence of tooth decay compared to the general population.

It would be desirable for this review to present a dental caries profile according to the type of CLP observed, which present very different patterns in terms of dental arches; however, the scientific articles related to the epidemiology of dental caries in individuals with CLP do not uniformly show this organization, so this criterion was not used as an inclusion or exclusion factor.

It should be noted that the teeth of patients with CLP do not differ in morphological structure from the teeth of other individuals. Because the tooth position is influenced by arch anomalies, the indication of prosthesis in individuals with CLP use teeth has pillars many times malpositioned because of the arch anomalies present (teeth giroversion, ectopic position, among others), along with misinformation or lack of education regarding oral health methods, may also contribute to a caries index showing an upward trend in these patients.¹

Data on the incidence of dental caries in patients with CLP between the case and control groups was not statistically different.³ However, the prevalence of dental caries is higher for individuals with CLP.^{8,16,18}

On the other hand, the dental and periodontal status of patients with CLP is similar to the general population; however, these people do not take the recommended preventive measures nor follow the guidance of a professional dentist.¹⁴ There is great difficulty in concluding statements in this theme, but it demonstrates that individuals with CLP are more susceptible to tooth decay.¹

The prevalence of dental caries in patients with CLP was higher than in the control group without this condition.^{4,10} A good oral hygiene linked to health education has a positive effect in reducing the incidence of dental caries in these individuals.¹⁴ The deficiency in oral hygiene and lack of prevention and health education to explain in increasing dental caries rate in individuals with CLP.⁵

There was no significant difference in the prevalence of DMFT among individuals with CLP and a control group; however, the authors observed a large number of unrestored teeth compared to children in the control group, indicating difficulties with access to oral health services.¹¹ Individuals with CLP have a greater need for preventive dental care and education.¹³ In children with CLP, there is an increase in the number of white spot early lesions, predisposing them to an increased risk for the development of cavitated caries lesions.¹⁷

Preventive and social aspects are concerns that many authors discuss in specialized literature. The caries prevalence is higher in people with CLP due to a lack of oral health care and access to oral health programs.⁶

Individuals with CLP are susceptible to tooth decay regardless of their social status. Therefore, a caries prevention program should be implemented for these individuals, considering the inherent difficulties related to the psychomotor skills of these children and their caregivers. Note that, for these individuals, poor oral hygiene and the accumulation of dental biofilms are local factors and determinants that may lead to periodontal diseases beyond dental caries.⁷

CONCLUSION

Overall, the rate of tooth decay found in individuals with CLP was higher than in the population without this condition. Therefore, there is a need for greater attention to be paid to the incidence of dental caries in individuals with CLP so that there is a schedule of educational and preventive actions that is consistent with the epidemiological needs of these people. This issue brings to light the necessity of new epidemiological studies to improve dental care for individuals with CLP.

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