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Original Article

The caries prevalence of oral clefts in eastern China

Wen-Lin Xiao[1,2], Dai-Zun Zhang[1,2], Yao-Xiang Xu[1,2]

[1]Department of Stomatology, [2]The Key Laboratory of Oral Clinical Medicine of Shandong Province, The Affiliated Hospital of Qingdao University, Qingdao 266003, China

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Abstract: Little information is available concerning the prevalence of caries among patients with oral clefts in Eastern China. Consecutive patients aged 6-18 with oral clefts were recruited. Patients were stratified into 2 groups according to their ages, namely Group I with aged 6-12 and Group II with aged 13-18. For each age group, the children were further divided into three subgroups according to the types of oral clefts they had: cleft lip/cleft lip and alveolus (CL), cleft palate only (CP), and cleft lip and palate (CLP). Dental caries were examined by using the decayed, missing, and filled index for primary teeth (dmft) and Decay, Missing and Filled index for Permanent teeth (DMFT) according to criteria of the World Health Organization. 268 eligible patients with oral clefts were included in the study. The mean DMFT for Group I was 1.77 (SD2.58) while that for Group II was 6.96 (SD4.35). The mean DMFT was statistically significant different between the age group I and age group II (t=12.21, P<0.05). In Group I, the dmft scores was 4.68 (SD3.67) for CL group, while that for the CP group was 7.36 (SD3.93), and that for the CLP group was 5.72 (SD 3.87). The mean dmft was no statistically significant different among cleft types (F=3.13, P>0.05). Also in Group I, the mean DMFT was 1.56 (SD2.18) for CL group, while that for the CP group was 1.24 (SD 1.81) and that for the CLP group was 2.08 (SD2.96). There were no statistically significant different in mean DMFT among different cleft types (F=1.09, P>0.05). In Group II, the mean DMFT was 6.06 (SD3.97) for CL group while that for the CP group was 7.71 (SD 4.94) and that for the CLP group was 7.05 (SD4.32). No significant difference was shown in the mean DMFT among different cleft groups (CL, CP, and CLP) (F=0.93, P>0.05). During assess the prevalence of dental caries among Eastern Chinese with oral clefts; the study confirmed that the prevalence of caries was increased with increasing age for oral clefts patients. It was also demonstrated that there was no significant difference in the mean dmft/DMFT scores among different cleft types.

Keywords: Dental caries, oral clefts, epidemiology

Introduction

Oral clefts are one of the most common congenital malformations of orofacial structures and constitute approximately 65% of the anomalies affecting the head and neck [1]. Oral clefts are the most common major congenital orofacial abnormalities and occur in approximately 1:700 to 4:1000 live births with significant racial and geographic variation [2, 3]. The prevalence rate varies with different ethnic backgrounds and countries. In China, the prevalence of oral clefts was reported to be 1.8% [4]. Of these patients with oral clefts, they often requires complex and individualized treatment spanning from birth to adulthood, thus warranting an interdisciplinary care provided by orthodontists, plastic surgeons, pediatric dentists, maxillofacial surgeons, speech pathologists, psychologists, social workers and so on.

Apart from the obvious orofacial gaps, these cleft patients have some other oral diseases such as dental & arch segment irregularities, together with postoperative scar problems, resulting in higher incidence of dental caries. In fact, even in modernized societies, dental caries is still a global public health problem causing a major threat to oral health of these cleft patients. Although the prevalence of dental caries in different countries around the world is reducing [5], patients with oral clefts remain at high risk for dental caries [6, 7]. Bian et al. [8] examined 3- to 5-year-old patients with cleft lip, cleft palate or both cleft lip and palate in Central China. He found that seventy-five percent of them had rampant caries. Zhu et al. [9] examined 3- to 25-year-old patients with clefts in Western China and revealed that the caries prevalence was significantly higher in patients with cleft palate. However, little information is

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SALIVARY α-AMYLASE

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Selected Salivary Physicochemical Properties among Cleft Lip and Palate Children in Iraq

Mais M. Almaeeni and Abeer Mohammed Hassan*

Department of Pedodontics and Preventive Dentistry, College of Dentistry, University of Baghdad, Baghdad, Iraq

**Corresponding e-mail:* abeerzwain@yahoo.com

ABSTRACT

Objective: *To investigate selected salivary properties in children with cleft lip and palate and to compare them with non-cleft children.* ***Setting:*** *The study was conducted in Dentistry College, University of Baghdad and Alwasity and Ghazi Alhareery Teaching Hospitals, Baghdad, Iraq.* ***Patients and methods:*** *A total of 36 children with non-syndromic repaired cleft lip and palate, aged 4 to 10 years, and a total of 37 non-cleft children were investigated for flow rate, pH, total antioxidant, uric acid, and total proteins.* ***Results:*** *Salivary total antioxidant capacity and total protein were significantly different between cleft lip and palate children and non-cleft children, while for salivary flow rate and total antioxidant were significantly lower in children with cleft lip and palate than in non-cleft children. Concerning pH and uric acid, there were no significant differences.* ***Conclusion:*** *Some salivary chemical constituents and some physical parameters deviated from the norm in children with cleft lip and palate.*

Keywords: Cleft lip and palate, Salivary flow rate, pH, Total antioxidant, Uric acid, Total proteins

INTRODUCTION

Orofacial cleft (OFC) is a congenital abnormal space or gap due to incomplete fusion of the embryologic prominences in the upper lip alveolus and/or palate during facial development which results in severe facial, morphological and functional impairment of sucking, swallowing and breathing. OFC is the most common craniofacial birth defects in humans [1,2]. The craniofacial structures development is a coordinated process involving the growth of multiple independently derived embryologic prominences called primordial. Incomplete fusion of these facial structures during the 4th to 12th week of embryologic life results in a gap which leads to cleft lip, cleft of the primary or secondary palate, or a combination of them [3,4]. Elevated infant mortality and significant lifelong morbidity are associated with OFC such as cosmetic deformities, feeding problems, swallowing difficulties, failure to gain weight, change in nose shape, recurrent ear infections, poor growth of the maxilla, speech difficulties, misaligned teeth and dental abnormalities [2,5,6].

Saliva has many essential functions such as lubrication, protection, buffering action, clearance and antibacterial activity so that saliva plays an important role in regulating and maintaining the integrity of the oral hard and soft tissues and in oral health monitoring [7]. The whole saliva offers an alternative to serum as a biologic fluid that can be analyzed for diagnostic purposes, so saliva has been investigated as a source of specific biomarkers for human disease such as cancer, periodontitis and in cleft lip palate children [8,9]. Saliva collection is a simple, inexpensive and non-invasive method [2].

Antioxidants are present in saliva, which constitutes the first line of defense against oxidative stress and has protective effects against microorganisms, toxins, and oxidants. The imbalances in free radical levels and reactive oxygen species with antioxidants may play a key role in the onset and development of several inflammatory oral pathologies [10]. Saliva has an antioxidant system that includes macromolecules, enzymes and an array of small molecules [11]. Uric acid is the most important antioxidant molecule, contributing approximately 70% of the total salivary antioxidant capacity. The antioxidant properties of uric acid have been attributed to its ability to chelate transition metals and to react with biological oxidants [8].

The protein and peptides composition of saliva play an important role in preserving the integrity and stability of the saliva and providing defense against infections and diseases such as periodontal disease or head and neck squamous

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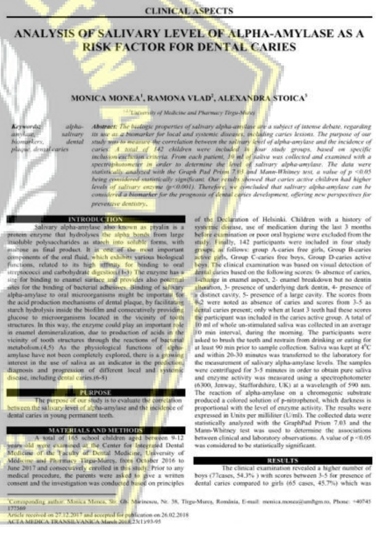

CLINICAL ASPECTS

ANALYSIS OF SALIVARY LEVEL OF ALPHA-AMYLASE AS A RISK FACTOR FOR DENTAL CARIES

MONICA MONEA[1], RAMONA VLAD[2], ALEXANDRA STOICA[3]

[1,2,3]University of Medicine and Pharmacy Tirgu-Mures

Keywords: *alpha-amylase, salivary biomarkers, dental plaque, dental caries*

Abstract: *The biologic properties of salivary alpha-amylase are a subject of intense debate, regarding its use as a biomarker for local and systemic diseases, including caries lesions. The purpose of our study was to measure the correlation between the salivary level of alpha-amylase and the incidence of caries. A total of 142 children were included in four study groups, based on specific inclusion/exclusion criteria. From each patient, 10 ml of saliva was collected and examined with a spectrophotometer in order to determine the level of salivary alpha-amylase. The data were statistically analyzed with the Graph Pad Prism 7.03 and Mann-Whitney test, a value of p <0.05 being considered statistically significant. Our results showed that caries active children had higher levels of salivary enzyme (p<0.001). Therefore, we concluded that salivary alpha-amylase can be considered a biomarker for the prognosis of dental caries development, offering new perspectives for preventive dentistry.*

INTRODUCTION

Salivary alpha-amylase also known as ptyalin is a protein enzyme that hydrolyses the alpha bonds from large insoluble polysaccharides as starch into soluble forms, with maltose as final product. It is one of the most important components of the oral fluid, which exhibits various biological functions, related to its high affinity for binding to oral streptococci and carbohydrate digestion.(1-3) The enzyme has a site for binding to enamel surface and provides also potential sites for the binding of bacterial adhesives. Binding of salivary alpha-amylase to oral microorganisms might be important for the acid production mechanisms of dental plaque, by facilitating starch hydrolysis inside the biofilm and consecutively providing glucose to microorganisms located in the vicinity of tooth structures. In this way, the enzyme could play an important role in enamel demineralization, due to production of acids in the vicinity of tooth structures through the reactions of bacterial metabolism.(4,5) As the physiological functions of alpha-amylase have not been completely explored, there is a growing interest in the use of saliva as an indicator in the prediction, diagnosis and progression of different local and systemic disease, including dental caries.(6-8)

PURPOSE

The purpose of our study is to evaluate the correlation between the salivary level of alpha-amylase and the incidence of dental caries in young permanent teeth.

MATERIALS AND METHODS

A total of 165 school children aged between 9-12 years old were examined at the Center for Integrated Dental Medicine of the Faculty of Dental Medicine, University of Medicine and Pharmacy Tirgu-Mures, from October 2016 to June 2017 and consecutively enrolled in this study. Prior to any medical procedure, the parents were asked to give a written consent and the investigation was conducted based on principles of the Declaration of Helsinki. Children with a history of systemic disease, use of medication during the last 3 months before examination or poor oral hygiene were excluded from the study. Finally, 142 participants were included in four study groups, as follows: group A-caries free girls, Group B-caries active girls, Group C-caries free boys, Group D-caries active boys. The clinical examination was based on visual detection of dental caries based on the following scores: 0- absence of caries, 1-change in enamel aspect, 2- enamel breakdown but no dentin alteration, 3- presence of underlying dark dentin, 4- presence of a distinct cavity, 5- presence of a large cavity. The scores from 0-2 were noted as absence of caries and scores from 3-5 as dental caries present; only when at least 3 teeth had these scores the participant was included in the caries active group. A total of 10 ml of whole un-stimulated saliva was collected in an average 10 min interval, during the morning. The participants were asked to brush the teeth and restrain from drinking or eating for at least 90 min prior to sample collection. Saliva was kept at 4°C and within 20-30 minutes was transferred to the laboratory for the measurement of salivary alpha-amylase levels. The samples were centrifuged for 3-5 minutes in order to obtain pure saliva and enzyme activity was measured using a spectrophotometer (6300, Jenway, Staffordshire, UK) at a wavelength of 590 nm. The reaction of alpha-amylase on a chromogenic substrate produced a colored solution of p-nitrophenol, which darkness is proportional with the level of enzyme activity. The results were expressed in Units per milliliter (U/ml). The collected data were statistically analyzed with the GraphPad Prism 7.03 and the Mann-Whitney test was used to determine the associations between clinical and laboratory observations. A value of p<0.05 was considered to be statistically significant.

RESULTS

The clinical examination revealed a higher number of boys (77cases, 54.3%) with scores between 3-5 for presence of dental caries compared to girls (65 cases, 45.7%) which was

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[1]Corresponding author: Monica Monea, Str. Gh. Marinescu, Nr. 38, Tirgu-Mures, România, E-mail: monica.monea@umftgm.ro, Phone: +40745 177369

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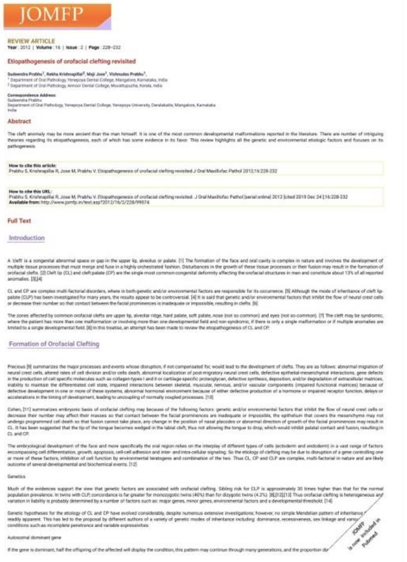

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REVIEW ARTICLE

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Etiopathogenesis of orofacial clefting revisited

Sudeendra Prabhu[1], Rekha Krishnapillai[2], Maji Jose[1], Vishnudas Prabhu[1],

[1] Department of Oral Pathology, Yenepoya Dental College, Mangalore, Karnataka, India

[2] Department of Oral Pathology, Annoor Dental College, Muvattupuzha, Kerala, India

Correspondence Address:
Sudeendra Prabhu
Department of Oral Pathology, Yenepoya Dental College, Yenepoya University, Deralakatte, Mangalore, Karnataka
India

Abstract

The cleft anomaly may be more ancient than the man himself. It is one of the most common developmental malformations reported in the literature. There are number of intriguing theories regarding its etiopathogenesis, each of which has some evidence in its favor. This review highlights all the genetic and environmental etiologic factors and focuses on its pathogenesis.

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Full Text

Introduction

A 'cleft' is a congenital abnormal space or gap in the upper lip, alveolus or palate. [1] The formation of the face and oral cavity is complex in nature and involves the development of multiple tissue processes that must merge and fuse in a highly orchestrated fashion. Disturbances in the growth of these tissue processes or their fusion may result in the formation of orofacial clefts. [2] Cleft lip (CL) and cleft palate (CP) are the single most common congenital deformity affecting the orofacial structures in man and constitute about 13% of all reported anomalies. [3],[4]

CL and CP are complex multi-factorial disorders, where in both genetic and/or environmental factors are responsible for its occurrence. [5] Although the mode of inheritance of cleft lip-palate (CLP) has been investigated for many years, the results appear to be controversial. [4] It is said that genetic and/or environmental factors that inhibit the flow of neural crest cells or decrease their number so that contact between the facial prominences is inadequate or impossible, resulting in clefts. [6]

The zones affected by common orofacial clefts are upper lip, alveolar ridge, hard palate, soft palate, nose (not so common) and eyes (not so common). [7] The cleft may be syndromic, where the patient has more than one malformation or involving more than one developmental field and non-syndromic, if there is only a single malformation or if multiple anomalies are limited to a single developmental field. [8] In this treatise, an attempt has been made to review the etiopathogenesis of CL and CP.

Formation of Orofacial Clefting

Precious [9] summarizes the major processes and events whose disruption, if not compensated for, would lead to the development of clefts. They are as follows: abnormal migration of neural crest cells, altered rates of cell division and/or cells death, abnormal localization of post-migratory neural crest cells, defective epithelial-mesenchymal interactions, gene defects in the production of cell specific molecules such as collagen types I and II or cartilage-specific proteoglycan, defective synthesis, deposition, and/or degradation of extracellular matrices, inability to maintain the differentiated cell state, impaired interactions between skeletal, muscular, nervous, and/or vascular components (impaired functional matrices) because of defective development in one or more of these systems, abnormal hormonal environment because of either defective production of a hormone or impaired receptor function, delays or accelerations in the timing of development, leading to uncoupling of normally coupled processes. [10]

Cohen, [11] summarizes embryonic basis of orofacial clefting may because of the following factors: genetic and/or environmental factors that inhibit the flow of neural crest cells or decrease their number may affect their masses so that contact between the facial prominences are inadequate or impossible, the epithelium that covers the mesenchyme may not undergo programmed cell death so that fusion cannot take place, any change in the position of nasal placodes or abnormal direction of growth of the facial prominences may result in CL. It has been suggested that the tip of the tongue becomes wedged in the labial cleft, thus not allowing the tongue to drop, which would inhibit palatal contact and fusion, resulting in CL and CP.

The embryological development of the face and more specifically the oral region relies on the interplay of different types of cells (ectoderm and endoderm) in a vast range of factors encompassing cell differentiation, growth, apoptosis, cell-cell adhesion and inter- and intra-cellular signaling. So the etiology of clefting may be due to disruption of a gene controlling one or more of these factors, inhibition of cell function by environmental teratogens and combination of the two. Thus CL, CP and CLP are complex, multi-factorial in nature and are likely outcome of several developmental and biochemical events. [12]

Genetics

Much of the evidences support the view that genetic factors are associated with orofacial clefting. Sibling risk for CLP is approximately 30 times higher than that for the normal population prevalence. In twins with CLP, concordance is far greater for monozygotic twins (40%) than for dizygotic twins (4.2%). [8],[12],[13] Thus orofacial clefting is heterogeneous and variation in liability is probably determined by a number of factors such as: major genes, minor genes, environmental factors and a developmental threshold. [14]

Genetic hypotheses for the etiology of CL and CP have evolved considerably, despite numerous extensive investigations; however, no simple Mendelian pattern of inheritance is readily apparent. This has led to the proposal by different authors of a variety of genetic modes of inheritance including: dominance, recessiveness, sex linkage and various conditions such as incomplete penetrance and variable expressivities.

Autosomal dominant gene

If the gene is dominant, half the offspring of the affected will display the condition, this pattern may continue through many generations, and the proportion di

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Prevalence of caries in Brazilian children with cleft lip and/or palate, aged 6 to 36 months

Agda Maria de Moura
Marcia André
Margareth Torrecillas Lopez
Reinaldo Brito e Dias

Department of Maxillofacial Surgery, Prosthesis and Traumatology, Faculdade de Odontologia, Univ de São Paulo - USP, São Paulo, SP, Brazil.

Abstract: The aim of this study was to assess the prevalence of caries in children with cleft lip and/or palate aged 6–36 months of life. This study was conducted at the University of São Paulo School of Dentistry, Brazil. A total of 143 children were selected (73 male, 70 female), all of whom had at least two erupted teeth. The children were distributed as follows: 88 had cleft lip and palate, 35 had cleft palate, 20 had cleft lip. Dental caries disease was diagnosed according to criteria set by the World Health Organization. It was observed that 18.9% of the study children had caries. No correlation between prevalence of caries and gender or type of cleft was observed. Mean dmf-t was 0.47. The prevalence of caries was higher in the upper arch, and the most affected tooth was the central incisor ($p = 0.001$). Children with cleft lip and/or palate did not have high caries indices.

Descriptors: Dental Caries; Prevalence; Cleft Lip; Cleft Palate; Infant.

Introduction

Cleft lip and/or palate are among the most prevalent congenital malformations in humans, and are influenced by complex genetic and environmental factors, with relative recurrence.[1] The international literature reports epidemiological indices of cleft lip and/or palate ranging from 0.87 to 1.03 per 1000 births.[2] These indices are similar to those reported in studies carried out in Brazil.[3]

Although not a major cause of mortality in developed countries, cleft lip and/or palate (CL/P) does cause considerable morbidity among affected children and imposes a substantial financial risk for families with a concomitant societal burden.[4]

CL/P is correlated with esthetic, functional and psychological problems, and calls for early preventive interventions involving a multidisciplinary team.[5]

The parents of cleft patients have higher expectations regarding the effectiveness of surgical treatment. They fail to realize the close connection between oral health or speech rehabilitation and correction of the malocclusion. Therefore, it is difficult to make them understand that early caries and dental loss can affect the success of surgical treatment, orthodontic treatment and speech therapy.[5]

Studies have reported that children with cleft lip and/or palate are at a high risk of dental caries. Zhu *et al.*[6], Al-Wahadni *et al.*[7], and Stec-Slonic

Declaration of Interests: The authors certify that they have no commercial or associative interest that represents a conflict of interest in connection with the manuscript.

Corresponding Author:
Agda Maria de Moura
E-mail: agdamoura@usp.br

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ORIGINAL ARTICLE

Comparative Salivary Proteomics of Cleft Palate Patients

Gyula Tamas Szabo, M.D., Reka Tihanyi, M.D., Fruzsina Csulak, M.D., Eva Jambor, M.Sc., Agnes Bona, M.Sc., Gyula Szabo, M.D., D.Sc., Laszlo Mark, Ph.D.

Objectives: To investigate salivary proteins with proteomic technologies to evaluate protein composition differences between samples with cleft lip and palate and healthy controls.

Design, Participants: Matrix-assisted laser desorption/ionization tandem time-of-flight (MALDI TOF/TOF) mass spectrometry was used as a high-throughput analytical technique for identification of nonsyndromic cleft lip and palate stimulated salivary proteins. The samples consisted of two groups: 31 cleft lip and palate patients and a control group with 20 healthy volunteers.

Results: The presence of cleft lip and palate stimulated the expression of several proteins, included adaptor-related protein complex 3, dermokine, nidogen 1 precursor, transforming growth factor-β3, and a zinc finger RAN-binding domain containing 2.

Conclusions: The salivary proteome of cleft lip and palate patients differs from the protein composition of healthy control saliva samples. Several common secreted proteins such as actins, salivary cystatins, and keratins were upregulated by cleft; increased levels of TGF-β3 and dermokine were detected in the pathologic samples. The current proteomic results suggest keratinocyte activation among patients with cleft lip and palate. The score of our preliminary results suggests the hypothesis that identified salivary proteins are of vital clinical importance in tissue regeneration and the molecular repair mechanism seen in patients with cleft lip and palate.

KEY WORDS: *birth defect, cleft lip and palate, MALDI TOF MS, salivary proteins*

Cleft lip and palate is the fourth most common birth defect and the most common facial birth defect. The cleft condition is identified during the fourth to eighth week of pregnancy, when a gap in facial structures results from incomplete fusion of the embryologic prominences during facial development (Schutte and Murray, 1999).

Clefting is associated with many problems such as cosmetic deformities, dental abnormalities, and speech, swallowing, and growth difficulties. Symptoms include a change in nose shape (amount of distortion varies), failure to gain weight, feeding problems, flow of milk through nasal passages during feeding, misaligned teeth, poor growth of the maxilla, recurrent ear infections, and speech difficulties (Jugessur et al., 2009).

The prevalence of orofacial cleft is related to genetic and environmental factors, geographic origin, and socioeconomic status. Multifactorial inheritance plays a major role in etiology because problems with genes are passed down from one or both parents. Environmental factors (teratogens) may also be associated with clefts: viral and bacterial infections, toxins, drugs, lack of oxygen during development, maternal smoking, maternal alcohol use, irradiation, and vitamin and other nutrient deficiencies all can cause such birth defects. Cleft lip and palate may occur along with other syndromes or birth defects (Murray, 2002).

Studies have attempted to identify the predisposing genes, but because of the complexity of the disorder, most studies have failed to identify major risk factors. One of these is identified as the gene that encodes interferon regulatory factor 6 (IRF6)—mutated in a rare condition called van de Woude syndrome—as a candidate gene on the basis of its involvement in an autosomal dominant form of cleft lip with or without cleft palate (Ingraham et al., 2006).

Over the past decade, saliva has been investigated as a source of specific biomarkers for human disease. Numerous studies have validated the use of saliva as an analysis

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Dr. G.T. Szabo is Assistant Professor, Department of Dentistry, Oral and Maxillofacial Surgery, Medical School, University of Pecs, Pecs, Hungary. Dr. Tihanyi is resident, Department of Dentistry, Oral and Maxillofacial Surgery, Medical School, University of Pecs, Pecs, Hungary. Dr. Csulak is resident, Department of Dentistry, Oral and Maxillofacial Surgery, Medical School, University of Pecs, Pecs, Hungary. Dr. Jambor is doctoral student, Institute of Biochemistry and Medical Chemistry, Medical School, University of Pecs, Pecs, Hungary. Dr. Bona is doctoral student, Institute of Biochemistry and Medical Chemistry, Medical School, University of Pecs, Pecs, Hungary. Dr. G. Szabo is Professor, Department of Dentistry, Oral and Maxillofacial Surgery, Medical School, University of Pecs, Pecs, Hungary. Dr. Mark is Associate Professor, Institute of Biochemistry and Medical Chemistry, Medical School, University of Pecs, Pecs, Hungary.

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Address correspondence to: Dr. Laszlo Mark, Institute of Biochemistry and Medical Chemistry, Faculty of Medicine, University of Pecs, Szigeti str. 12, H-7624 Pecs, Hungary. E-mail laszlo.mark@aok.pte.hu.

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Comparison of risk indicators of dental caries in children with and without cleft lip and palate deformities

Rubina Shashni, Ashima Goyal[1], Krishan Gauba[1], Ashok Kumar Utreja[2], Pallab Ray[3], Ashok Kumar Jena[4]

Abstract

Objective: To test the hypothesis that there are no differences in various risk factors of dental caries among children with cleft lip and palate when compared to non-cleft high caries risk and non-cleft caries free children. **Design:** Seventy-three children in the age range of 4–9 years comprised three groups; Group-I ($n = 23$, children with cleft lip and palate), Group-II ($n = 25$, non-cleft high caries risk children) and Group-III ($n = 25$, non-cleft caries free children). Various risk factors for dental caries like type of oral hygiene practice, sugar exposures/day, developmental defects of enamel, caries activity, salivary streptococci mutans levels and lactobacilli levels were evaluated and compared among the three groups of children. **Results:** The mean deft score among Group-II children was significantly more ($P < 0.01$) as compared to the Group-I children. The mean deft + DMFT score among Group-I and Group-II children was comparable ($P = 0.149$). Developmental enamel defects were more among Group-I children as compared to Group-II and Group-III children ($P < 0.01$). Hypoplasia of the maxillary anterior teeth was more common among Group-I children as compared to Group-II ($P < 0.05$) and Group-III children ($P < 0.001$). The association between hypoplastic teeth and dental caries was significant ($P < 0.05$). The salivary acidogenic potential as evaluated by Snyder test was comparable among Group-I and Group-II children. The salivary streptococcus mutans levels in Group-I and Group-II children were higher when compared to lactobacillus counts. **Conclusion:** The risk factors of dental caries among children with cleft lip and palate were more as compared to non-cleft high caries risk and non-cleft caries free children.

Keywords: Cleft lip and palate, dental caries, risk factors

Introduction

Children with cleft lip and palate require a multidisciplinary approach in their management. In majority of the standard protocols designed for the management of children with cleft lip and/or palate, globally, the role of pediatric dentist has not been referred to, in spite of the high prevalence of dental caries, gum diseases and developmental defects reported in these children. These children are at high risk of developing dental caries,[1-4] with a reported deft score ranging between 2.35 and 13.5 among different communities around the world.[1,3] The high prevalence of dental diseases in children with cleft lip and/or palate has been attributed to irregularity of teeth, anatomy of cleft area, tight repaired lip with a tendency for food to accumulate in the cleft area, nasal discharge through cleft which acts as a feast for cariogenic microorganisms, hypoplastic defects, prolonged feeding especially at night time and increased consumption of sugary foods.[1-6]

In spite of reported high caries prevalence, a few studies[1-3,7,8] have been conducted to evaluate the cariogenic risk factors in these children for planning and implementing an effective primary preventive oral health regimen, at an early age and also to give pediatric oral health care its due position in management of these children. The present study evaluated various risk factors of dental caries viz. sugar exposures/day, hypoplastic defects in teeth, salivary acidogenic potential, brushing frequency and salivary levels of cariogenic bacteria in children with cleft lip and palate and compared these parameters with age-matched non-cleft high caries risk children and non-cleft caries free children.

Materials and Methods

Seventy-three children in the age range of 4–9 years were distributed into three groups. Group-I included 23 children with cleft lip and palate who were selected from among

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Department of Pedodontics, ACPM Dental College, Dhule, Maharashtra, [1]Unit of Pediatric Dentistry, Oral Health Sciences Centre, [2]Unit of Orthodontics, Oral Health Sciences Centre, [3]Department of Microbiology, Post Graduate Institute of Medical Education and Research, Chandigarh, [4]Unit of Orthodontics, Department of Dental Surgery, All India Institute of Medical Sciences, Bhubaneswar, Odisha, India

Correspondence: Prof. Ashima Goyal,
Unit of Pediatric Dentistry, Oral Health Sciences Centre,
Post Graduate Institute of Medical Education and Research,
Chandigarh, India.
E-mail: ashimapgi@yahoo.in

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ORIGINAL ARTICLE

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A. R. Ness
J. R. Sandy

Functional outcomes in the Cleft Care UK study – Part 3: oral health and audiology

Authors' affiliations:
J. Smallridge, South Thames' Cleft Unit, Guy's and St Thomas Hospital, London, UK
J. Smallridge, Cleft Net East Cleft Network, Addenbrooke's Hospital, Cambridge, UK
A. J. Hall, Children's Hearing Centre, University Hospitals Bristol NHS Foundation Trust, Bristol, UK
A. J. Hall, School of Social and Community Medicine, University of Bristol, Bristol, UK
R. Chorbachi, North Thames Cleft Centre, Great Ormond Street Hospital for Children and Broomfield Hospital, London, UK
V. Parfect, East of England Cleft Network, Audiology, Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK
M. Persson, Centre for Appearance Research, University of the West of England, Bristol, UK
A. J. Ireland, A. K. Wills, A. R. Ness, J. R. Sandy, School of Oral and Dental Sciences, University of Bristol, Bristol, UK
A. R. Ness, National Institute for Health Research (NIHR) Biomedical Research Unit in Nutrition, Diet and Lifestyle at the University Hospitals Bristol NHS Foundation Trust and the University of Bristol, Bristol, UK

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Structured Abstract

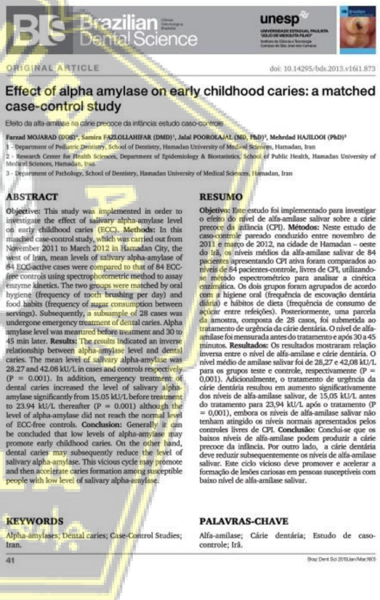
Objectives – To compare oral health and hearing outcomes from the Clinical Standards Advisory Group (CSAG, 1998) and the Cleft Care UK (CCUK, 2013) studies.

Setting and sample population – Two UK-based cross-sectional studies of 5-year-olds born with non-syndromic unilateral cleft lip and palate undertaken 15 years apart. CSAG children were treated in a dispersed model of care with low-volume operators. CCUK children were treated in a centralized, high volume operator system.

Materials and methods – Oral health data were collected using a standardized proforma. Hearing was assessed using pure tone audiometry and middle ear status by otoscopy and tympanometry. ENT and hearing history were collected from medical notes and parental report.

Results – Oral health was assessed in 264 of 268 children (98.5%). The mean dmft was 2.3, 48% were caries free, and 44.7% had untreated caries. There was no evidence this had changed since the CSAG survey. Oral hygiene was generally good, 96% were enrolled with a dentist. Audiology was assessed in 227 of 268 children (84.7%). Forty-three per cent of children received at least one set of grommets – a 17.6% reduction compared to CSAG. Abnormal middle ear status was apparent in 50.7% of children. There was no change in hearing levels, but more children with hearing loss were managed with hearing aids.

Conclusions – Outcomes for dental caries and hearing were no better in CCUK than in CSAG, although there was reduced use of grommets



Brazilian Dental Science

unesp
UNIVERSIDADE ESTADUAL PAULISTA "JÚLIO DE MESQUITA FILHO"
Instituto de Ciência e Tecnologia
Campus de São José dos Campos

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Effect of alpha amylase on early childhood caries: a matched case-control study

Efeito da alfa-amilase na cárie precoce da infância: estudo caso-controle

Farzad MOJARAD (DDS)[1], Samira FAZLOLLAHIFAR (DMD)[1], Jalal POOROLAJAL (MD, PhD)[2], Mehrdad HAJILOOI (PhD)[3]

1 - Department of Pediatric Dentistry, School of Dentistry, Hamadan University of Medical Sciences, Hamadan, Iran
2 - Research Center for Health Sciences, Department of Epidemiology & Biostatistics, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran
3 - Department of Pathology, School of Dentistry, Hamadan University of Medical Sciences, Hamadan, Iran

ABSTRACT

Objective: This study was implemented in order to investigate the effect of salivary alpha-amylase level on early childhood caries (ECC). **Methods:** In this matched case-control study, which was carried out from November 2011 to March 2012 in Hamadan City, the west of Iran, mean levels of salivary alpha-amylase of 84 ECC-active cases were compared to that of 84 ECC-free controls using spectrophotometric method to assay enzyme kinetics. The two groups were matched by oral hygiene (frequency of tooth brushing per day) and food habits (frequency of sugar consumption between servings). Subsequently, a subsample of 28 cases was undergone emergency treatment of dental caries. Alpha amylase level was measured before treatment and 30 to 45 min later. **Results:** The results indicated an inverse relationship between alpha-amylase level and dental caries. The mean level of salivary alpha-amylase was 28.27 and 42.08 kU/L in cases and controls respectively (P = 0.001). In addition, emergency treatment of dental caries increased the level of salivary alpha-amylase significantly from 15.05 kU/L before treatment to 23.94 kU/L thereafter (P = 0.001) although the level of alpha-amylase did not reach the normal level of ECC-free controls. **Conclusion:** Generally it can be concluded that low levels of alpha-amylase may promote early childhood caries. On the other hand, dental caries may subsequently reduce the level of salivary alpha-amylase. This vicious cycle may promote and then accelerate caries formation among susceptible people with low level of salivary alpha-amylase.

RESUMO

Objetivo: Este estudo foi implementado para investigar o efeito do nível de alfa-amilase salivar sobre a cárie precoce da infância (CPI). **Métodos:** Neste estudo de caso-controle pareado conduzido entre novembro de 2011 e março de 2012, na cidade de Hamadan – oeste do Irã, os níveis médios da alfa-amilase salivar de 84 pacientes apresentando CPI ativa foram comparados ao níveis de 84 pacientes-controle, livres de CPI, utilizando-se método espectrométrico para analisar a cinética enzimática. Os dois grupos foram agrupados de acordo com a higiene oral (frequência de escovação dentária diária) e hábitos de dieta (frequência de consumo de açúcar entre refeições). Posteriormente, uma parcela da amostra, composta de 28 casos, foi submetida ao tratamento de urgência da cárie dentária. O nível de alfa-amilase foi mensurada antes do tratamento e após 30 a 45 minutos. **Resultados:** Os resultados mostraram relação inversa entre o nível de alfa-amilase e cárie dentária. O nível médio de amilase salivar foi de 28,27 e 42,08 kU/L para os grupos teste e controle, respectivamente (P = 0,001). Adicionalmente, o tratamento de urgência da cárie dentária resultou em aumento significativamente dos níveis de alfa-amilase salivar, de 15,05 kU/L antes do tratamento para 23,94 kU/L após o tratamento (P = 0,001), embora os níveis de alfa-amilase salivar não tenham atingido os níveis normais apresentados pelos controles livres de CPI. **Conclusão:** Conclui-se que os baixos níveis de alfa-amilase podem produzir a cárie precoce da infância. Por outro lado, a cárie dentária deve reduzir subsequentemente os níveis de alfa-amilase salivar. Este ciclo vicioso deve promover e acelerar a formação de lesões cariosas em pessoas susceptíveis com baixo nível de alfa-amilase salivar.

KEYWORDS

Alpha-amylases; Dental caries; Case-Control Studies; Iran.

PALAVRAS-CHAVE

Alfa-amilase; Cárie dentária; Estudo de caso-controle; Irã.

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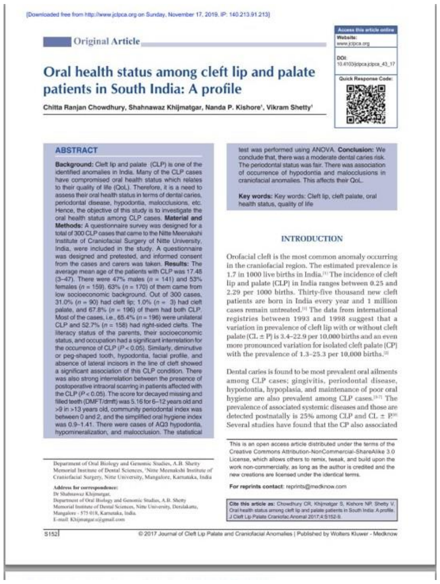

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Original Article

Oral health status among cleft lip and palate patients in South India: A profile

Chitta Ranjan Chowdhury, Shahnawaz Khijmatgar, Nanda P. Kishore[1], Vikram Shetty[1]

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ABSTRACT

Background: Cleft lip and palate (CLP) is one of the identified anomalies in India. Many of the CLP cases have compromised oral health status which relates to their quality of life (QoL). Therefore, it is a need to assess their oral health status in terms of dental caries, periodontal disease, hypodontia, malocclusions, etc. Hence, the objective of this study is to investigate the oral health status among CLP cases. **Material and Methods:** A questionnaire survey was designed for a total of 300 CLP cases that came to the Nitte Meenakshi Institute of Craniofacial Surgery of Nitte University, India, were included in the study. A questionnaire was designed and pretested, and informed consent from the cases and carers was taken. **Results:** The average mean age of the patients with CLP was 17.48 (3–47). There were 47% males ($n = 141$) and 53% females ($n = 159$). 63% ($n = 170$) of them came from low socioeconomic background. Out of 300 cases, 31.0% ($n = 90$) had cleft lip; 1.0% ($n = 3$) had cleft palate, and 67.8% ($n = 196$) of them had both CLP. Most of the cases, i.e., 65.4% ($n = 196$) were unilateral CLP and 52.7% ($n = 158$) had right-sided clefts. The literacy status of the parents, their socioeconomic status, and occupation had a significant interrelation for the occurrence of CLP ($P < 0.05$). Similarly, diminutive or peg-shaped tooth, hypodontia, facial profile, and absence of lateral incisors in the line of cleft showed a significant association of this CLP condition. There was also strong interrelation between the presence of postoperative intraoral scarring in patients affected with the CLP ($P < 0.05$). The score for decayed missing and filled teeth (DMFT/dmft) was 5.16 for 6–12 years old and >9 in >13 years old, community periodontal index was between 0 and 2, and the simplified oral hygiene index was 0.9–1.41. There were cases of AQ3 hypodontia, hypomineralization, and malocclusion. The statistical test was performed using ANOVA. **Conclusion:** We conclude that, there was a moderate dental caries risk. The periodontal status was fair. There was association of occurrence of hypodontia and malocclusions in craniofacial anomalies. This affects their QoL.

Key words: Key words: Cleft lip, cleft palate, oral health status, quality of life

INTRODUCTION

Orofacial cleft is the most common anomaly occurring in the craniofacial region. The estimated prevalence is 1.7 in 1000 live births in India.[1] The incidence of cleft lip and palate (CLP) in India ranges between 0.25 and 2.29 per 1000 births. Thirty-five thousand new cleft patients are born in India every year and 1 million cases remain untreated.[1] The data from international registries between 1993 and 1998 suggest that a variation in prevalence of cleft lip with or without cleft palate (CL ± P) is 3.4–22.9 per 10,000 births and an even more pronounced variation for isolated cleft palate (CP) with the prevalence of 1.3–25.3 per 10,000 births.[2]

Dental caries is found to be most prevalent oral ailments among CLP cases; gingivitis, periodontal disease, hypodontia, hypoplasia, and maintenance of poor oral hygiene are also prevalent among CLP cases.[3-7] The prevalence of associated systemic diseases and those are detected postnatally is 25% among CLP and CL ± P.[8] Several studies have found that the CP also associated

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Department of Oral Biology and Genomic Studies, A.B. Shetty Memorial Institute of Dental Sciences, [1]Nitte Meenakshi Institute of Craniofacial Surgery, Nitte University, Mangalore, Karnataka, India

Address for correspondence:
Dr Shahnawaz Khijmatgar,
Department of Oral Biology and Genomic Studies, A.B. Shetty Memorial Institute of Dental Sciences, Nitte University, Deralakatte, Mangalore - 575 018, Karnataka, India.
E-mail: Khijmatgar.s@gmail.com

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Comparative Evaluation of Salivary Total Protein Levels in Patients with Cleft Lippalate to Healthy Children in Mixed Dentition Age Group

Rahul R. Deshpande[a,b], Samrat Sabhlok[a], Vishwas Patil[a], Shreya Dasgupta[a*], Ankit Kumar[a], Shubham Singh[a]

[a] Dr. D. Y. Patil Dental College and Hospital, Pimpri, Pune -18, Maharashtra, India
[b] Deenanath Mangeshkar Hospital, Pune, India

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Corresponding Author:
Dr. Dasgupta S.*
B.D.S.
Email: shreya_writeme@yahoo.co.in

Dr. Deshpande R. R.
M.D.S. Pedodontics and Preventive Dentistry

Dr. Sabhlok S.
M.D.S. Oral and Maxillofacial Surgery

Dr. Patil V.
M.D.S. Pedodontics and Preventive Dentistry

Dr. Kumar A.
B.D.S.

Dr. Singh S.
B.D.S.

Abstract

Cleft lip and palate is a common developmental defect which disfigures the happy smile of a new born. The commonly used laboratory diagnostic procedure involves the analysis of cellular and chemical constituents of blood, which is an invasive. This study focuses on a non-invasive method to compare the levels of total proteins in saliva of children with cleft lip and palate and healthy children to aid as a bio-marker for further studies. The procedure involves the analysis and comparison of salivary total protein levels in healthy individuals with those with cleft lip and palate in mixed dentition age group. The saliva was allowed to drool into the funnel held to the lower lip. Diluted saliva sample were subjected to inductively coupled plasma emission spectroscopy. The total proteins and free amino acids were detected by liquid chromatography coupled with mass spectrometry (LC-MS). Physical properties of saliva in healthy and in cleft lip and palate showed a marked difference. The salivary total protein levels demonstrated higher levels of total proteins in patients with the cleft lip and palate defect than healthy children. Saliva offers an alternative to serum as a biologic fluid that can be analyzed for diagnostic purposes.

Citation:
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1. Introduction

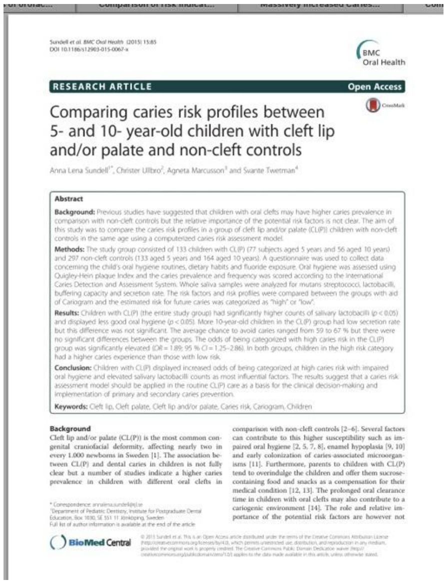
1.1 Importance of Saliva

Saliva is one of the most important protective body fluids but remains the least understood (Bhalla et al., 2010). Saliva has various functions in the oral environment like clearing of food debris and bacteria, buffering capacity on tissue damaging strong bases and acids, providing saturated solution of calcium needed in re mineralization of teeth; it also has antibacterial, anti fungal and antiviral capacity (Kauffman et al., 2002).

1.2 Saliva as a Diagnostic tool

Components of saliva, therefore, may serve as biomarkers because the composition of oral fluid is responsive to behavioural, mechanical, genetic or ontogenetic stimuli (Sivakumar et al., 2009). The recent development of saliva as a diagnostic medium has placed dentistry at the forefront of monitoring systemic health and disease and has served saliva as a ' Tearless' diagnostic tool. The most commonly used laboratory diagnostic

Photon 255



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BMC Oral Health

RESEARCH ARTICLE Open Access

Comparing caries risk profiles between 5- and 10- year-old children with cleft lip and/or palate and non-cleft controls

Anna Lena Sundell[1*], Christer Ullbro[2], Agneta Marcusson[3] and Svante Twetman[4]

Abstract

Background: Previous studies have suggested that children with oral clefts may have higher caries prevalence in comparison with non-cleft controls but the relative importance of the potential risk factors is not clear. The aim of this study was to compare the caries risk profiles in a group of cleft lip and/or palate (CL(P)) children with non-cleft controls in the same age using a computerized caries risk assessment model.

Methods: The study group consisted of 133 children with CL(P) (77 subjects aged 5 years and 56 aged 10 years) and 297 non-cleft controls (133 aged 5 years and 164 aged 10 years). A questionnaire was used to collect data concerning the child's oral hygiene routines, dietary habits and fluoride exposure. Oral hygiene was assessed using Quigley-Hein plaque Index and the caries prevalence and frequency was scored according to the International Caries Detection and Assessment System. Whole saliva samples were analyzed for mutans streptococci, lactobacilli, buffering capacity and secretion rate. The risk factors and risk profiles were compared between the groups with aid of Cariogram and the estimated risk for future caries was categorized as "high" or "low".

Results: Children with CL(P) (the entire study group) had significantly higher counts of salivary lactobacilli ($p < 0.05$) and displayed less good oral hygiene ($p < 0.05$). More 10-year-old children in the CL(P) group had low secretion rate but this difference was not significant. The average chance to avoid caries ranged from 59 to 67 % but there were no significant differences between the groups. The odds of being categorized with high caries risk in the CL(P) group was significantly elevated (OR = 1.89; 95 % CI = 1.25–2.86). In both groups, children in the high risk category had a higher caries experience than those with low risk.

Conclusion: Children with CL(P) displayed increased odds of being categorized at high caries risk with impaired oral hygiene and elevated salivary lactobacilli counts as most influential factors. The results suggest that a caries risk assessment model should be applied in the routine CL(P) care as a basis for the clinical decision-making and implementation of primary and secondary caries prevention.

Keywords: Cleft lip, Cleft palate, Cleft lip and/or palate, Caries risk, Cariogram, Children

Background

Cleft lip and/or palate (CL(P)) is the most common congenital craniofacial deformity, affecting nearly two in every 1.000 newborns in Sweden [1]. The association between CL(P) and dental caries in children is not fully clear but a number of studies indicate a higher caries prevalence in children with different oral clefts in comparison with non-cleft controls [2–6]. Several factors can contribute to this higher susceptibility such as impaired oral hygiene [2, 5, 7, 8], enamel hypoplasia [9, 10] and early colonization of caries-associated microorganisms [11]. Furthermore, parents to children with CL(P) tend to overindulge the children and offer them sucrose-containing food and snacks as a compensation for their medical condition [12, 13]. The prolonged oral clearance time in children with oral clefts may also contribute to a cariogenic environment [14]. The role and relative importance of the potential risk factors are however not

* Correspondence: annalena.sundell@rjl.se
[1]Department of Pediatric Dentistry, Institute for Postgraduate Dental Education, Box 1030, SE 551 11 Jönköping, Sweden
Full list of author information is available at the end of the article

BioMed Central

Cleft Lip and Palate
An Evidence-Based Review

David Shaye, MD[a], C. Carrie Liu, MD[b], Travis T. Tollefson, MD, MPH[c,*]

KEYWORDS
• Cleft lip • Cleft palate • Evidence-based medicine • Outcomes

KEY POINTS

- The repair of unilateral cleft lip is performed using a rotation-advancement, geometric, straight-line, or hybrid technique.
- For bilateral cleft lip repair, most surgeons use either the Millard or Mulliken technique, and their variations.
- Most cleft centers perform cleft lip repair at the age of 3 to 6 months.
- Presurgical infant orthopedics, which can include nasoalveolar molding, is used before definitive cleft lip repair.
- For cleft palate repair, the 2-flap palatoplasty and Furlow double-opposing Z-plasty are most commonly used.

INTRODUCTION

At an estimated prevalence of 16.86 cases per 10,000 live births, isolated cleft palate, as well as cleft lip with or without cleft palate, is the most common congenital orofacial malformation in the United States.[1] Children with cleft anomalies may experience a multitude of physical and developmental challenges. There also may be psychosocial and emotional concerns for the patients and their families. As such, comprehensive care for the patient with cleft lip and/or palate requires an interdisciplinary team. The guidelines for team care outlined by the American Cleft Palate Association recommend team members that may include anesthesiology, audiology, genetics, neurosurgery, nursing, ophthalmology, oral maxillofacial surgery, orthodontics, otolaryngology–head and neck surgery, pediatrics, pediatric dentistry, physical anthropology, plastic surgery, prosthodontics, psychiatry, psychology, social work, and speech-language pathology.[2] Although every specialty may not be represented, the quality of care is augmented through collaborative discussion and coordination of care.

Broadly speaking, orofacial cleft anomalies may be unilateral or bilateral and involve the lip, the palate, or both. Although there have been considerable publications on this topic, most are single-surgeon/center experience papers or are retrospective in nature. As a result, the cleft lip-cleft palate literature regarding the clinical and surgical decision points lacks consensus. This review article seeks to define the typical management plans, describe the various viewpoints, and suggest recommendations based on the levels of evidence (**Table 1**) on the management of cleft lip

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Conflicts of interest: none.

[a] Division of Facial Plastic and Reconstructive Surgery, Massachusetts Eye & Ear Infirmary, Harvard Medical School, 243 Charles Street, Boston, MA 02114, USA; [b] Division of Otolaryngology – Head and Neck Surgery, Department of Surgery, Foothills Medical Centre, University of Calgary, 1403 – 29 Street Northwest, South Tower Room 602, Calgary, Alberta T2N 2T9, Canada; [c] Facial Plastic and Reconstructive Surgery, Department

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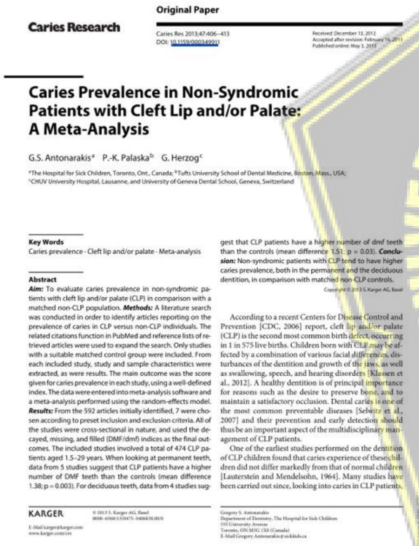

Original Paper

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Caries Prevalence in Non-Syndromic Patients with Cleft Lip and/or Palate: A Meta-Analysis

G.S. Antonarakis[a] P.-K. Palaska[b] G. Herzog[c]

[a]The Hospital for Sick Children, Toronto, Ont., Canada; [b]Tufts University School of Dental Medicine, Boston, Mass., USA;
[c]CHUV University Hospital, Lausanne, and University of Geneva Dental School, Geneva, Switzerland

Key Words
Caries prevalence · Cleft lip and/or palate · Meta-analysis

Abstract

Aim: To evaluate caries prevalence in non-syndromic patients with cleft lip and/or palate (CLP) in comparison with a matched non-CLP population. ***Methods:*** A literature search was conducted in order to identify articles reporting on the prevalence of caries in CLP versus non-CLP individuals. The related citations function in PubMed and reference lists of retrieved articles were used to expand the search. Only studies with a suitable matched control group were included. From each included study, study and sample characteristics were extracted, as were results. The main outcome was the score given for caries prevalence in each study, using a well-defined index. The data were entered into meta-analysis software and a meta-analysis performed using the random-effects model. ***Results:*** From the 592 articles initially identified, 7 were chosen according to preset inclusion and exclusion criteria. All of the studies were cross-sectional in nature, and used the decayed, missing, and filled (DMF/dmf) indices as the final outcomes. The included studies involved a total of 474 CLP patients aged 1.5–29 years. When looking at permanent teeth, data from 5 studies suggest that CLP patients have a higher number of DMF teeth than the controls (mean difference 1.38; p = 0.003). For deciduous teeth, data from 4 studies suggest that CLP patients have a higher number of dmf teeth than the controls (mean difference 1.51; p = 0.03). ***Conclusion:*** Non-syndromic patients with CLP tend to have higher caries prevalence, both in the permanent and the deciduous dentition, in comparison with matched non-CLP controls.

According to a recent Centers for Disease Control and Prevention [CDC, 2006] report, cleft lip and/or palate (CLP) is the second most common birth defect, occurring in 1 in 575 live births. Children born with CLP may be affected by a combination of various facial differences, disturbances of the dentition and growth of the jaws, as well as swallowing, speech, and hearing disorders [Klassen et al., 2012]. A healthy dentition is of principal importance for reasons such as the desire to preserve bone, and to maintain a satisfactory occlusion. Dental caries is one of the most common preventable diseases [Selwitz et al., 2007] and their prevention and early detection should thus be an important aspect of the multidisciplinary management of CLP patients.

One of the earliest studies performed on the dentition of CLP children found that caries experience of these children did not differ markedly from that of normal children [Lauterstein and Mendelsohn, 1964]. Many studies have been carried out since, looking into caries in CLP patients.

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Gregory S. Antonarakis
Department of Dentistry, The Hospital for Sick Children
555 University Avenue
Toronto, ON M5G 1X8 (Canada)
E-Mail Gregory.Antonarakis@sickkids.ca

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The assessment of sIgA, histatin-5, and lactoperoxidase levels in saliva of adolescents with dental caries

E 1 Agnieszka Gornowicz
C 2 Grażyna Tokajuk
D 1 Anna Bielawska
A 3 Elżbieta Maciorkowska
F 3 Robert Jabłoński
B 4 Anna Wójcicka
CE 5 Krzysztof Bielawski

Corresponding Author: Agnieszka Gornowicz, e-mail: agnieszka.gornowicz@umb.edu.pl

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Background: Saliva contains a number of protective factors such as mucins, immunoglobulins (e.g., IgA, IgG, and IgM), and enzymes (e.g., lysozyme and lactoperoxidases) that play an important role in the maintenance of oral health. The aim of this study was to compare levels of sIgA, histatin-5, and lactoperoxidase in saliva of adolescents with dental caries.

Material/Methods: Thirty-five adolescents (age 18 years) from high school were examined. Eight subjects with DMF=3 (Group I) and 27 adolescents with DMF>11 (Group II) were enrolled for this study. Clinical evaluation procedures comprised oral examination (including tooth, periodontal, and oral mucosal status) and collection of saliva samples. Saliva was collected for enzyme-linked immunosorbent assay (ELISA) and was used for determination of sIgA, histatin-5, and lactoperoxidase levels.

Results: Our results showed that adolescents with very high intensity of dental caries (DMF>11) had increased levels of sIgA, histatin-5, and lactoperoxidase compared to adolescents with lower intensity of caries. The increase was statistically significant (p<0.05).

Conclusions: We suggest that high intensity of caries is associated with increased levels of some salivary components – sIgA, histatin-5 and lactoperoxidase – that possess strong bactericidal or bacteriostatic effects, resulting in aggregation of oral bacteria and their clearance from the oral cavity.

MeSH Keywords: **Dental Caries Susceptibility • Histatins • Lactoperoxidase • Saliva**

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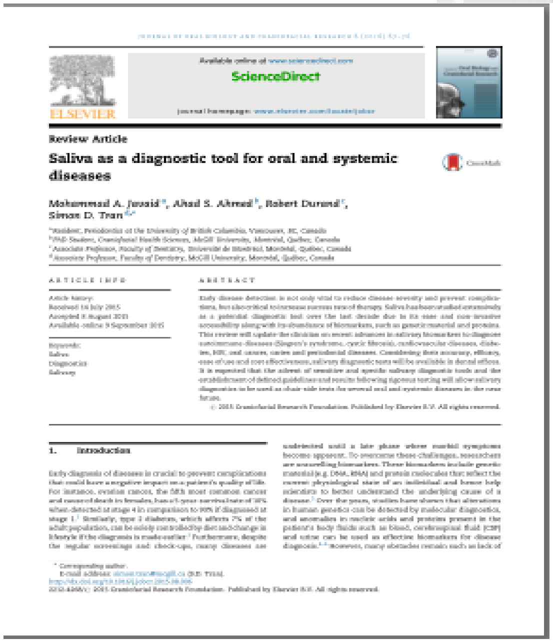

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Review Article

Saliva as a diagnostic tool for oral and systemic diseases

Mohammad A. Javaid[a], Ahad S. Ahmed[b], Robert Durand[c], Simon D. Tran[d,*]

[a]Resident, Periodontics at the University of British Columbia, Vancouver, BC, Canada
[b]PhD Student, Craniofacial Health Sciences, McGill University, Montréal, Québec, Canada
[c]Associate Professor, Faculty of Dentistry, Université de Montréal, Montréal, Québec, Canada
[d]Associate Professor, Faculty of Dentistry, McGill University, Montréal, Québec, Canada

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Salivary

ABSTRACT

Early disease detection is not only vital to reduce disease severity and prevent complications, but also critical to increase success rate of therapy. Saliva has been studied extensively as a potential diagnostic tool over the last decade due to its ease and non-invasive accessibility along with its abundance of biomarkers, such as genetic material and proteins. This review will update the clinician on recent advances in salivary biomarkers to diagnose autoimmune diseases (Sjogren's syndrome, cystic fibrosis), cardiovascular diseases, diabetes, HIV, oral cancer, caries and periodontal diseases. Considering their accuracy, efficacy, ease of use and cost effectiveness, salivary diagnostic tests will be available in dental offices. It is expected that the advent of sensitive and specific salivary diagnostic tools and the establishment of defined guidelines and results following rigorous testing will allow salivary diagnostics to be used as chair-side tests for several oral and systemic diseases in the near future.

1. Introduction

Early diagnosis of diseases is crucial to prevent complications that could have a negative impact on a patient's quality of life. For instance, ovarian cancer, the fifth most common cancer and cause of death in females, has a 5-year survival rate of 30% when detected at stage 4 in comparison to 90% if diagnosed at stage 1.[1] Similarly, type 2 diabetes, which affects 7% of the adult population, can be solely controlled by diet and change in lifestyle if the diagnosis is made earlier.[2] Furthermore, despite the regular screenings and check-ups, many diseases are undetected until a late phase where morbid symptoms become apparent. To overcome these challenges, researchers are unravelling biomarkers. These biomarkers include genetic material (e.g. DNA, RNA) and protein molecules that reflect the current physiological state of an individual and hence help scientists to better understand the underlying cause of a disease.[3] Over the years, studies have shown that alterations in human genetics can be detected by molecular diagnostics, and anomalies in nucleic acids and proteins present in the patient's body fluids such as blood, cerebrospinal fluid (CSF) and urine can be used as effective biomarkers for disease diagnosis.[4–6] However, many obstacles remain such as lack of

* Corresponding author.
E-mail address: simon.tran@mcgill.ca (S.D. Tran).

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Association between Maternal Folate Intake and Polymorphism MTHFR A1298C as Risk Factor of Non-Syndromic Cleft Lips

Yayun Siti Rochmah[1], Stefani Haramsari[1], Agung Sosiawan[3], Isni Rajiani[4]

[1]Departement of Oral and Maxillofacial Surgery Faculty of Dentistry, [2]Departement of Biology Faculty of Medicine, Sultan Agung Islamic University, Semarang, Indonesia; [3]Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga, Surabaya Indonesia; [4]Deputy to Chairman, STIAMAK Barunawati, Surabaya, Indonesia

ABSTRACT

Background: Methylenetetrahydrofolate reductase (MTHFR) is often associated with the incidence of orofacial clefts. Folic acid deficiency has gained considerable attention because of its promising role in modulating diverse clinical condition such as cleft. The objective of the study is to describe the association of MTHFR A1298C polymorphism and maternal folate intake with an orofacial cleft in Sasak Population.

Method: This study used control case design, the number of the subjects were 148 who were divided into case groups and their mother (70 issues) and control groups and their mother (78 items). The detection of Polymorphism MTHFR A1298C used PCR-RFLP and sequencing for confirmation. The information on the dietary pattern and folic acid intake used FFQ (Food Frequency Questionnaire).

Results: MTHFR A1298C polymorphism was associated with maternal folic acid intake in Sasak (p = 0,001), OR = 14,7 CI 95% (2,49-85,53) for cases and (p= 0,041), OR = 4,4 CI 95%(0,9-19,16) for control group. Maternal folic acid intake was associated with cleft (p=0,037) OR= 2,7 CI 95% (1,06-6,94) in Sasak Population.

Conclusion: Maternal folic acid was as the risk factor cleft lip/palate in Sasak population and association with MTHFR A1298C Polymorphism.

Keywords: *Polymorphism MTHFR A1298C, folic acid, orofacial clefts*

INTRODUCTION

The incidence of nonsyndromic cleft lip with or without cleft palate (NS CL/P) remains high in all over the world. In Indonesia, there will be 3000 to 6000 new cases of cleft lip annually accounting for 2.4% or 1.7 per 1,000 live births[1]. In Asian countries such as India, the incidence of cleft lip is high in which 35. 000 babies were born with the cleft[2]. In Africa, the number of people with cleft lip tends to be less (1: 2,500 births)[3]. Multifactorial factors including genetic and environmental are contributing in cleft lips[4]. Methyltetrahydrofolate Reductase (*MTHFR*) A1298C is *MTHFR* genotype variants that are thought to contribute to cleft lip, or palate[1]. *MTHFR* is an enzyme that converts 5, 10-methylenetetrahydrofolate from folic acid into 5-methyltetrahydrofolate in folate cycle. The endogenous folate cycle is a predominant methyl donor to remethylate homocysteine (Hcy) into methionine[6]. Pregnant women with MTHFR polymorphism have a higher risk to get folate deficiency[7]. The food sources that rich in folate are liver, fish, and meat, mushroom, green leafy vegetables such as spinach, bean leaves, nuts, and yeast. Food processing can destroy 50-90% of folate content by heating, oxidation, and exposure to ultraviolet light[8]. Dietary folates are conjugated by *Gamma-glutamyl hydrolase*/folate into monoglutamate assisted by Zink[9]. Folate deficiency and abnormal metabolism of folic acid and Hcy play a significant role in the incidence

Corresponding Author:
Yayun Siti Rochmah,
Jl Raya Kaligawe Km.4,
PO BOX 1054, Semarang Central Java of Indonesia.

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Original Article

Analysis of Salivary IgA, Amylase, Lactoferrin, and Lysozyme Before and After Comprehensive Dental Treatment in Children: A Prospective Study

Akhilesh Sharma, Priya Subramaniam, Shebin Moiden

Department of Pedodontics and Preventive Dentistry, The Oxford Dental College and Hospital, Bengaluru, Karnataka, India

Keywords: Amylase, dental caries, lactoferrin, lysozyme, salivary IgA

Introduction

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The Open Dentistry Journal, 2013, 7, 7-15 7

Open Access

Salivary Alpha-Amylase Activity and Salivary Flow Rate in Young Adults

Aristidis Arhakis[1,*], Vasilis Karagiannis[2] and Sotirios Kalfas[1]

[1]School of Dentistry, Aristotle University of Thessaloniki, Thessaloniki, Greece

[2]School of Mathematics, Aristotle University of Thessaloniki, Thessaloniki, Greece

Keywords: Salivary flow rate, salivary alpha-amylase, age.

INTRODUCTION

MATERIALS AND METHODOLOGY

Saliva Samples

1874-2106/13 2013 Bentham Open

Advances in Health Science Research, volume 8

International Dental Conference of Sumatera Utara 2017 (IDCSU 2017)

sIgA and Lisozim as Biomarker of Early Childhood Caries Risk

Essie Octiara
Doctoral Student
Faculty of Dentistry, Universitas Sumatera Utara
Medan, Indonesia

Heriandi Sutadi
Department of Pediatric Dentistry
Faculty of Dentistry, Universitas Indonesia
Jakarta, Indonesia

Yahwardiah Siregar
Department of Biochemistry
Faculty of Medicine, Universitas Sumatera Utara
Medan, Indonesia

Ameta Primasari
Department of Oral Biology
Faculty of Dentistry, Universitas Sumatera Utara
Medan, Indonesia

Keyword –ECC, sIgA, salivary lysozyme, biomarker

I. INTRODUCTION

Research Reports: Biological

Massively Increased Caries Susceptibility in an Irf6 Cleft Lip/Palate Model

B. Tamasas[1,2] and T.C. Cox[2,3,4]

Journal of Dental Research 2017, Vol. 96(3) 315–322

Abstract

Keywords: orofacial cleft(s), dental caries susceptibility, mucosal immunity, craniofacial biology/genetics, periodontal disease/periodontitis, salivary antimicrobial proteins

Introduction

Enzyme Immunoassay and Enzyme-Linked Immunosorbent Assay

Stephanie D. Gan[1] and Kruti R. Patel[2]

Journal of Investigative Dermatology (2013) 133, e12. doi:10.1038/jid.2013.287

INTRODUCTION

WHAT ENZYME-LINKED IMMUNOSORBENT ASSAY (ELISA) DOES

GENERAL PRINCIPLES

LIMITATIONS

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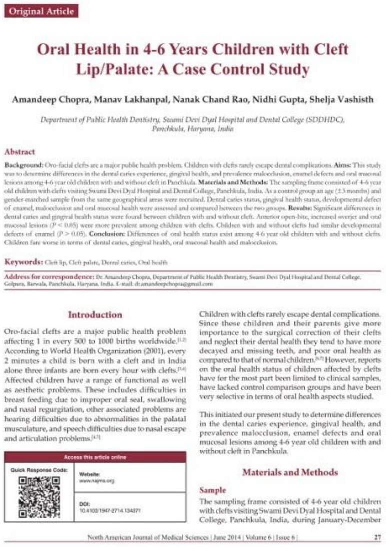


Original Article

Oral Health in 4-6 Years Children with Cleft Lip/Palate: A Case Control Study

Amandeep Chopra, Manav Lakhanpal, Nanak Chand Rao, Nidhi Gupta, Shelja Vashisth

Department of Public Health Dentistry, Swami Devi Dyal Hospital and Dental College (SDDHDC), Panchkula, Haryana, India

Abstract

Keywords: Cleft lip, Cleft palate, Dental caries, Oral health

Introduction

Materials and Methods

Sample

North American Journal of Medical Sciences | June 2014 | Volume 6 | Issue 6 | 27

ORIGINAL RESEARCH

10.5005/jp-journals-10015-1455

Dental Caries and Dental Anomalies in Children with Cleft Lip and Cleft Palate in Bengaluru City, India

[1]Seema Kamble, [2]Shivalinga S Hiremath, [3]Manjunath P Puranik, [4]Rahul Gaikwad, [5]Ashwini Biradar
[6]Amol R Gadbail, [7]Sachin C Sarode [8]Gargi S Sarode, [9]Shankargouda Patil

ABSTRACT

Aim: The aim of this study was to assess the association of dental caries and dental anomalies among 5- to 15-year-old children with cleft lip and cleft palate.

Materials and methods: A cross-sectional study was conducted among 500 children with cleft lip and/or cleft palate and 500 children without cleft of the age group 5 to 15 years. The clinical examination was carried out using decayed, missing, and filled teeth (DMFT) by Klein Plamer and Knutson, and dmft by Grubbel and 1997 World Health Organization (WHO) pro forma.

Results: The results showed a statistically significant increase in the prevalence of dental caries in children with cleft lip and/or cleft palate. The mean DMFT was found to be significantly higher in operated children than in the children who were not operated. Other dental abnormalities included an increased frequency of enamel hypoplasia ($p<0.001$), hyperdontia ($p<0.014$), anterior, unilateral and bilateral cross-bite ($p<0.001$), and open bite ($p<0.001$).

Conclusion: The results of this study show that children with cleft have higher prevalence of dental anomalies than the normal children. With increased occurrence of hypoplasia in children with cleft, reduced access for cleaning upper anterior teeth after surgical repair leads to poor oral hygiene status, leading to increased risk to dental caries.

Clinical significance: Given the high caries experience among the children with cleft lip and cleft palate, it is necessary to advocate a more rigorous approach to the prevention of dental disease in these high-risk children. They should therefore, be subjected to regular checkups, oral hygiene advice, diet advice, appropriate fluoride supplementation, and, when required, appropriate referral for secondary care.

Keywords: Cleft lip, Cleft palate, Dental anomalies, Dental caries.

How to cite this article: Kamble S, Hiremath SS, Puranik MP, Gaikwad R, Biradar A, Gadbail AR, Sarode SC, Sarode GS, Patil S. Dental Caries and Dental Anomalies in Children with Cleft Lip and Cleft Palate in Bengaluru City, India. World J Dent 2017;8(4):304-308.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Cleft lip and cleft palate are one of the most common congenital craniofacial anomalies. In India, these birth defects affect approximately 1:500 or 1:800 live births. The presence of cleft lip or palate has been associated with developmental anomalies. Numerous surgeries are required to repair oral clefts, and the timing for these surgeries depends on the child's stage of development. For this reason, there has been a great interest in the dental development and the possible differences in the development in the cleft population.[1]

Children with an oral cleft require extra care for their oral health and dentition status.[2] They often need complex and extensive treatment, usually provided by an interdisciplinary team of orthodontists, plastic surgeons, pedodontists, maxillofacial surgeons, speech therapist, and others. Following surgical repair of the cleft, the long-term oral health management of patient revolves around dental caries, malocclusion, and hypoplasia.[3]

Dental caries is still a global public health problem that constitutes the main threat to the children's oral health today.[4] With the presence of cleft in the oral cavity, the maintenance of good oral hygiene is difficult, and the children are more at risk of developing dental caries. Hence, this study was carried out to assess the prevalence

[1]Department of Public Health Dentistry, Nair Hospital Dental College, Mumbai, Maharashtra, India

[2]Department of Public Health Dentistry, The Oxford Dental College & Hospital, Bengaluru, Karnataka, India

[3]Department of Public Health Dentistry, Government Dental College and Research Institute, Bengaluru, Karnataka, India

[4]Department of Community Dentistry and Oral Epidemiology College of Dentistry, Qassim University, Buraydah, Kingdom of Saudi Arabia

[5]Department of Public Health Dentistry, SB Patil Dental College and Hospital, Bidar, Karnataka, India

[6]Department of Dentistry, Indira Gandhi Government Medical College & Hospital, Nagpur, Maharashtra, India

[7,8]Department of Oral Pathology and Microbiology, Dr. D. Y. Patil Dental College & Hospital, Dr. D. Y. Patil Vidyapeeth, Pune Maharashtra, India

[9]Department of Oral and Maxillofacial Surgery, Division of Oral Pathology, College of Dentistry, Jazan University, Jazan Kingdom of Saudi Arabia

Corresponding Author: Sachin C Sarode, Department of Oral Pathology and Microbiology, Dr. D. Y. Patil Dental College & Hospital, Dr. D. Y. Patil Vidyapeeth, Pune, Maharashtra, India Phone: +919922491465, e-mail: drsachinsarode@gmail.com/ sachin.sarode@dpu.edu.in

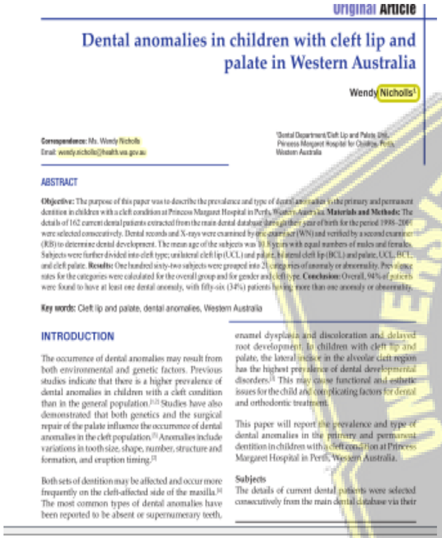
304

Original Article

A comprehensive review of orofacial cleft patients at a university hospital genetic department in the UK

ABSTRACT

INTRODUCTION



Original Article

Dental anomalies in children with cleft lip and palate in Western Australia

Wendy Nicholls[1]

Correspondence: Ms. Wendy Nicholls
Email: wendy.nicholls@health.wa.gov.au

[1]Dental Department/Cleft Lip and Palate Unit, Princess Margaret Hospital for Children, Perth, Western Australia

ABSTRACT

Objective: The purpose of this paper was to describe the prevalence and type of dental anomalies in the primary and permanent dentition in children with a cleft condition at Princess Margaret Hospital in Perth, Western Australia. **Materials and Methods:** The details of 162 current dental patients extracted from the main dental database through their year of birth for the period 1998–2004 were selected consecutively. Dental records and X-rays were examined by one examiner (WN) and verified by a second examiner (RB) to determine dental development. The mean age of the subjects was 10.8 years with equal numbers of males and females. Subjects were further divided into cleft type; unilateral cleft lip (UCL) and palate, bilateral cleft lip (BCL) and palate, UCL, BCL, and cleft palate. **Results:** One hundred sixty-two subjects were grouped into 21 categories of anomaly or abnormality. Prevalence rates for the categories were calculated for the overall group and for gender and cleft type. **Conclusion:** Overall, 94% of patients were found to have at least one dental anomaly, with fifty-six (34%) patients having more than one anomaly or abnormality.

Key words: Cleft lip and palate, dental anomalies, Western Australia

INTRODUCTION

The occurrence of dental anomalies may result from both environmental and genetic factors. Previous studies indicate that there is a higher prevalence of dental anomalies in children with a cleft condition than in the general population.[1,2] Studies have also demonstrated that both genetics and the surgical repair of the palate influence the occurrence of dental anomalies in the cleft population.[3] Anomalies include variations in tooth size, shape, number, structure and formation, and eruption timing.[3]

Both sets of dentition may be affected and occur more frequently on the cleft-affected side of the maxilla.[4] The most common types of dental anomalies have been reported to be absent or supernumerary teeth, enamel dysplasia and discoloration and delayed root development. In children with cleft lip and palate, the lateral incisor in the alveolar cleft region has the highest prevalence of dental developmental disorders.[3] This may cause functional and esthetic issues for the child and complicating factors for dental and orthodontic treatment.

This paper will report the prevalence and type of dental anomalies in the primary and permanent dentition in children with a cleft condition at Princess Margaret Hospital in Perth, Western Australia.

Subjects

The details of current dental patients were selected consecutively from the main dental database via their

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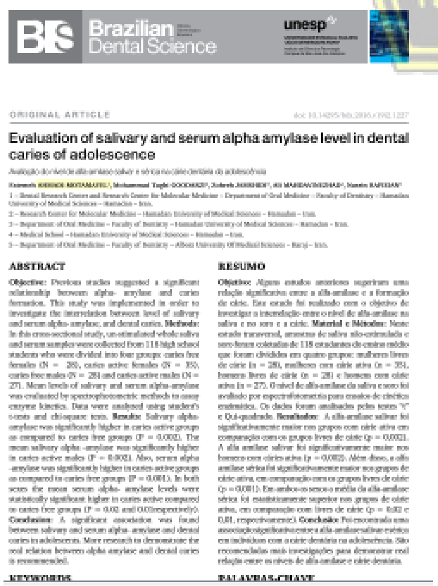
AM Hazza'a
MA Rawashdeh
K Al-Nimri
R Al Habashneh

Dental and oral hygiene status in Jordanian children with cleft lip and palate: a comparison between unilateral and bilateral clefts

Abstract:

Key words:

Introduction



Brazilian Dental Science

unesp

ORIGINAL ARTICLE

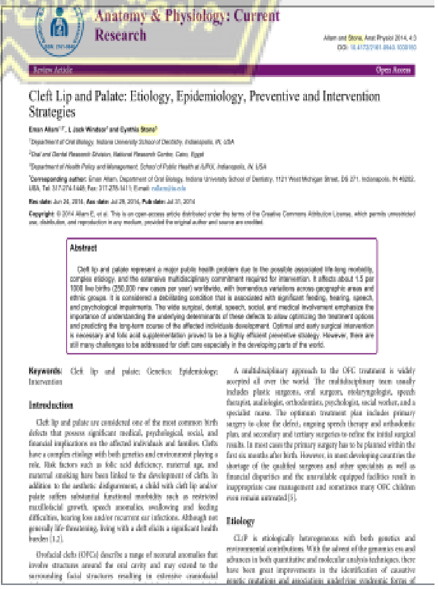
Evaluation of salivary and serum alpha amylase level in dental caries of adolescence

ABSTRACT

RESUMO

KEYWORDS

PALAVRAS-CHAVE



Anatomy & Physiology: Current Research

Review Article

Open Access

Cleft Lip and Palate: Etiology, Epidemiology, Preventive and Intervention Strategies

Abstract

Cleft lip and palate represent a major public health problem due to the possible associated life-long morbidity, complex etiology, and the extensive multidisciplinary commitment required for intervention. It affects about 1.5 per 1000 live births (250,000 new cases per year) worldwide, with tremendous variations across geographic areas and ethnic groups. It is considered a debilitating condition that is associated with significant feeding, hearing, speech, and psychological impairments. The wide surgical, dental, speech, social, and medical involvement emphasize the importance of understanding the underlying determinants of these defects to allow optimizing the treatment options and predicting the long-term course of the affected individuals development. Optimal and early surgical intervention is necessary and folic acid supplementation proved to be a highly efficient preventive strategy. However, there are still many challenges to be addressed for cleft care especially in the developing parts of the world.

Keywords: Cleft lip and palate; Genetics; Epidemiology; Intervention

Introduction

Etiology

RESEARCH ARTICLE

Psychosocial Stress Increases Salivary Alpha-Amylase Activity Independently from Plasma Noradrenaline Levels

Liubov Petrakova[1], Bettina K. Doering[2], Sabine Vits[1], Harald Engler[1], Winfried Rief[2], Manfred Schedlowski[1], Jan-Sebastian Grigoleit[1,3]*

1 Institute of Medical Psychology and Behavioral Immunobiology, University of Duisburg-Essen, Essen, Germany, 2 Department of Clinical Psychology & Psychotherapy, Philipps-University Marburg, Marburg, Germany, 3 Laboratory of Neuronal Structure and Function, The Salk Institute for Biological Studies, La Jolla, California, United States of America

* jgrigoleit@salk.edu

OPEN ACCESS

Citation: Petrakova L, Doering BK, Vits S, Engler H, Rief W, Schedlowski M, et al. (2015) Psychosocial Stress Increases Salivary Alpha-Amylase Activity Independently from Plasma Noradrenaline Levels. PLoS ONE 10(8): e0134561. doi:10.1371/journal.pone.0134561

Editor: Ulrike Schmidt, Max Planck Institute of Psychiatry, GERMANY

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Data Availability Statement: All relevant data are within the paper.

Funding: This study was funded by sponsor Biologische Heilmittel Heel GmbH, Dr. Reckeweg-Str. 2-4, 76532 Baden-Baden, Germany (http://www.heel.com). This study is part of a larger project aiming to evaluate the efficacy of a drug in experimental stress conditions (EudraCT number: 2012-002259-40, ClinicalTrials.gov identifier: NCT01705652). The sponsor was involved in study design but not in data collection and analysis, decision to publish, or preparation of the manuscript.

Abstract

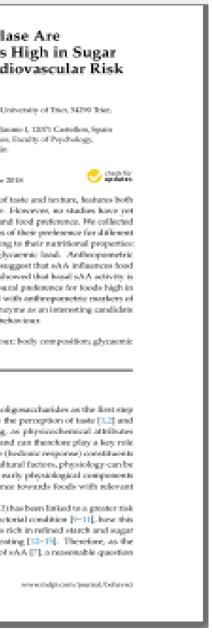
Salivary alpha-amylase activity (sAA) and plasma noradrenaline (NA) concentrations are often considered to be surrogate markers of sympathetic activation in response to stress. However, despite accumulating evidence for a close association between sAA and noradrenaline and other indicators of sympathetic activity, reliability and generality of this relation remains unclear. We employed the Trier Social Stress Test (TSST) in order to directly compare the responses in sAA and NA to psychological stress in healthy volunteers (n = 23). The TSST significantly increased sAA and NA plasma levels with no significant differences in females and males. However, when subjects were divided according to their NA responses into low versus high responders, both groups did not significantly differ in their sAA before, during or after stress exposure. These data suggest that in response to acute psychological stress both plasma NA levels and sAA reflect sympathetic activity, however seemed to increase independently from each other.

Introduction

Salivary alpha-amylase (sAA) is one of the major enzymes in the oral cavity. Beyond its primary function, the hydrolysis of starch and glycogen, it is involved in defense against bacteria with low sAA activity being related to a higher risk of oral infection [1]. In addition, stress-induced increases in sAA activity suggest sAA as surrogate marker of sympathetic activation [2].

Since salivary cortisol became the standard indicator of hypothalamic-pituitary-adrenal (HPA) axis activity, a comparably easy-to-use salivary measure for activity of the sympathetic-adrenal medullary system (SAMS) is highly desired. First evidence that stress-induced changes in sAA activity in humans may be dependent on beta-adrenergic transmission came from a study in which an increase in sAA activity in response to a cold water stressor was prevented

Page 1 of 18



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University of Trier, 54290 Trier,

Jaume I, 12071 Castellon, Spain
es, Faculty of Psychology,
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of taste and texture, features both
e. However, no studies have yet
and food preference. We collected
s of their preference for different
ing to their nutritional properties:
glycaemic load. Anthropometric
suggest that sAA influences food
showed that basal sAA activity is
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nzyme as an interesting candidate
behaviour.

ous; body composition; glycaemic

oligosaccharides as the first step
the perception of taste [1,2] and
g, as physicochemical attributes
and can therefore play a key role
e (hedonic response) constituents
ultural factors, physiology can be
early physiological components
nce towards foods with relevant

2) has been linked to a greater risk
ctorial condition [9–11], how this
s rich in refined starch and sugar
esting [12–15]. Therefore, as the
of sAA [7], a reasonable question

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Research article

The relationship between the level of salivary alpha amylase activity and pain severity in patients with symptomatic irreversible pulpitis

Fatemeh Ahmadi-Motamayel[1]*, Shahriar Shahriari[1], Mohammad Taghi Goodarzi[2], Abbas Moghimbeigi[3], Mina Jazaeri[4], Parisa Babaei[5]

Objectives: Assessment of dental pain severity is very challenging in dentistry. Previous studies have suggested that elevated salivary alpha amylase may contribute to increased physical stresses. There is a close association between salivary alpha amylase and plasma norepinephrine under stressful physical conditions. The aim of this study was to evaluate the relationship between pain severity and salivary alpha amylase levels in patients with symptomatic irreversible pulpitis. **Materials and Methods:** Forty-six patients (20 females and 26 males) with severe tooth pain due to symptomatic irreversible pulpitis were selected. The visual analogue scale (VAS) score was used to assess the pain severity in each patient. Unstimulated whole saliva was collected, and the level of alpha amylase activity was assessed by the spectrophotometric method. Statistical analysis was performed using SPSS 13. **Results:** The level of alpha amylase was significantly increased in the saliva in association with pain severity assessed by VAS. The salivary alpha amylase was also elevated with increased age and in males. **Conclusions:** There was a significant correlation between the VAS pain scale and salivary alpha amylase level, which indicates this biomarker may be a good index for the objective assessment of pain intensity. (Restor Dent Endod 2013;38(3):141-145)

Key words: Alpha Amylase; Pain; Pulpitis; Saliva

Introduction

Pain is an unpleasant feeling conducted via the sensory neurons to the brain. Although pain mostly occurs due to injuries, it can also be initiated by psychosocial causes or inferred from other sites. Therefore, difficulty sometimes exists in finding its original cause. Pulp exposure, which may happen after dental caries or acute trauma, leads to pulp damage, which may be followed by intermittent or spontaneous pain. Significant temperature changes could induce long and severe pulpal pain, which may even be prolonged after the removal of the stimulant. The pain will be more severe and localized if inflammation spreads to the periodontal ligament and the surrounding bone.

Saliva has many proteins, and 50 - 60% of salivary protein consists of alpha amylase. Amylase, an important salivary protein, has been suggested as a potential biomarker of the sympathetic reaction to psychosocial stress and parasympathetic responses. Although salivary amylase is related to the level of catecholamine in plasma, it cannot be considered a comprehensive indicator of the catecholamine level. Shirasaki et al. found a significant relationship between pain and the level of salivary alpha amylase.

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Comparison of risk indicat... | Massively increased caries...

Sundell et al. BMC Oral Health (2015) 15:85
DOI 10.1186/s12903-015-0067-x

BMC Oral Health

RESEARCH ARTICLE | Open Access

Comparing caries risk profiles between 5- and 10- year-old children with cleft lip and/or palate and non-cleft controls

Anna Lena Sundell[1*], Christer Ullbro[2], Agneta Marcusson[3] and Svante Twetman[4]

Abstract

Background: Previous studies have suggested that children with oral clefts may have higher caries prevalence in comparison with non-cleft controls but the relative importance of the potential risk factors is not clear. The aim of this study was to compare the caries risk profiles in a group of cleft lip and/or palate (CL(P)) children with non-cleft controls in the same age using a computerized caries risk assessment model.

Methods: The study group consisted of 133 children with CL(P) (77 subjects aged 5 years and 56 aged 10 years) and 297 non-cleft controls (133 aged 5 years and 164 aged 10 years). A questionnaire was used to collect data concerning the child's oral hygiene routines, dietary habits and fluoride exposure. Oral hygiene was assessed using Quigley-Hein plaque Index and the caries prevalence and frequency was scored according to the International Caries Detection and Assessment System. Whole saliva samples were analyzed for mutans streptococci, lactobacilli, buffering capacity and secretion rate. The risk factors and risk profiles were compared between the groups with aid of Cariogram and the estimated risk for future caries was categorized as "high" or "low".

Results: Children with CL(P) (the entire study group) had significantly higher counts of salivary lactobacilli ($p < 0.05$) and displayed less good oral hygiene ($p < 0.05$). More 10-year-old children in the CL(P) group had low secretion rate but this difference was not significant. The average chance to avoid caries ranged from 59 to 67 % but there were no significant differences between the groups. The odds of being categorized with high caries risk in the CL(P) group was significantly elevated ($OR = 1.89$; 95 % $CI = 1.25–2.86$). In both groups, children in the high risk category had a higher caries experience than those with low risk.

Conclusion: Children with CL(P) displayed increased odds of being categorized at high caries risk with impaired oral hygiene and elevated salivary lactobacilli counts as most influential factors. The results suggest that a caries risk assessment model should be applied in the routine CL(P) care as a basis for the clinical decision-making and implementation of primary and secondary caries prevention.

Keywords: Cleft lip, Cleft palate, Cleft lip and/or palate, Caries risk, Cariogram, Children

Background

Cleft lip and/or palate (CL(P)) is the most common congenital craniofacial deformity, affecting nearly two in every 1.000 newborns in Sweden [1]. The association between CL(P) and dental caries in children is not fully clear but a number of studies indicate a higher caries prevalence in children with different oral clefts in comparison with non-cleft controls [2–6]. Several factors can contribute to this higher susceptibility such as impaired oral hygiene [2, 5, 7, 8], enamel hypoplasia [9, 10] and early colonization of caries-associated microorganisms [11]. Furthermore, parents to children with CL(P) tend to overindulge the children and offer them sucrose-containing food and snacks as a compensation for their medical condition [12, 13]. The prolonged oral clearance time in children with oral clefts may also contribute to a cariogenic environment [14]. The role and relative importance of the potential risk factors are however not

* Correspondence: annalena.sundell@rjl.se
[1] Department of Pediatric Dentistry, Institute for Postgraduate Dental Education, Box 1030, SE 551 11 Jönköping, Sweden
Full list of author information is available at the end of the article

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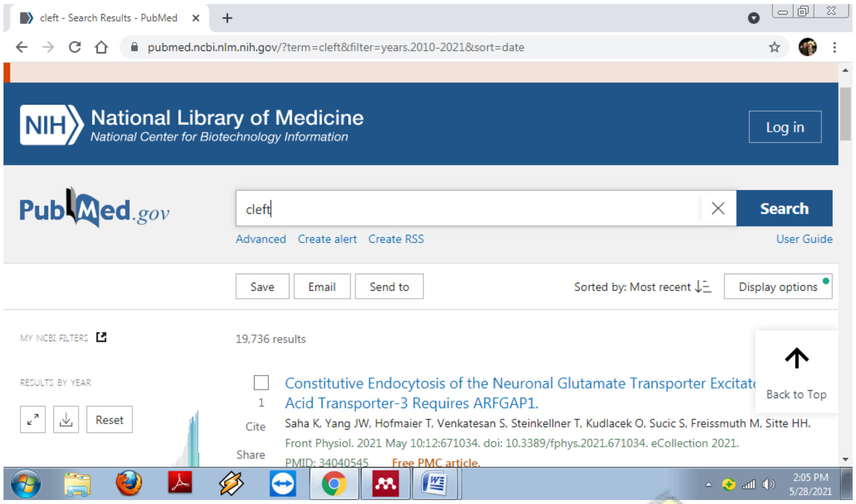
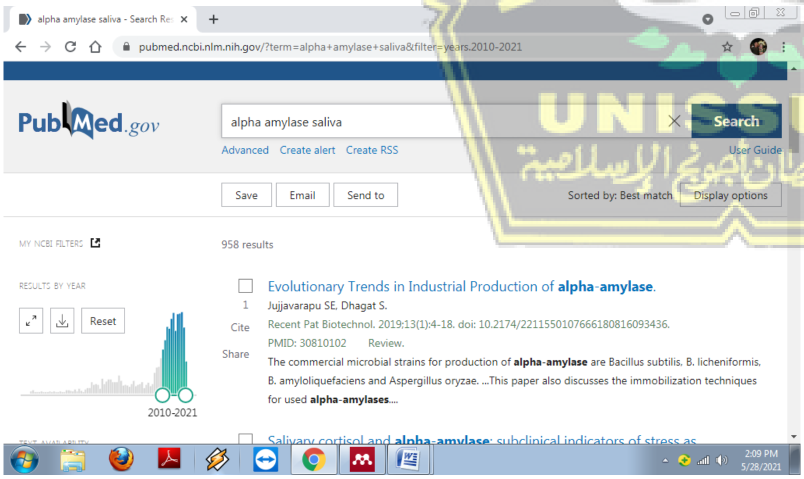


19,736 results

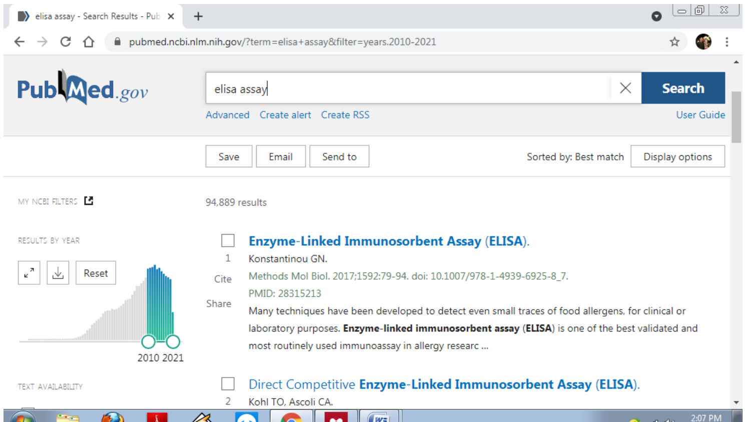
1 Constitutive Endocytosis of the Neuronal Glutamate Transporter Excitat Acid Transporter-3 Requires ARFGAP1.
Saha K, Yang JW, Hofmaier T, Venkatesan S, Steinkellner T, Kudlacek O, Sucic S, Freissmuth M, Sitte HH.
Front Physiol. 2021 May 10;12:671034. doi: 10.3389/fphys.2021.671034. eCollection 2021.
PMID: 34040545 Free PMC article.



958 results

1 Evolutionary Trends in Industrial Production of **alpha-amylase**.
Jujjavarapu SE, Dhagat S.
Recent Pat Biotechnol. 2019;13(1):4-18. doi: 10.2174/2211550107666180816093436.
PMID: 30810102 Review.
The commercial microbial strains for production of **alpha-amylase** are Bacillus subtilis, B. licheniformis, B. amyloliquefaciens and Aspergillus oryzae. ...This paper also discusses the immobilization techniques for used **alpha-amylases**....

Salivary cortisol and **alpha-amylase**: subclinical indicators of stress as



94,889 results

1 **Enzyme-Linked Immunosorbent Assay** (**ELISA**).
Konstantinou GN.
Methods Mol Biol. 2017;1592:79-94. doi: 10.1007/978-1-4939-6925-8_7.
PMID: 28315213
Many techniques have been developed to detect even small traces of food allergens, for clinical or laboratory purposes. **Enzyme-linked immunosorbent assay** (**ELISA**) is one of the best validated and most routinely used immunoassay in allergy researc ...

2 Direct Competitive **Enzyme-Linked Immunosorbent Assay** (**ELISA**).
Kohl TO, Ascoli CA.