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Original Work

Prevalence of cleft lip and palate in Brazilian children 2011 - 2015

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ABSTRACT: Cleft lip and cleft palate are birth defects of complex etiology. The aim of this study was to evaluate the occurrence of cleft lip and palate in Brazilian children. An ecological and descriptive study, based on data from the Live Birth Information System (SINASC / DATASUS) between years 2011 and 2015 in the cities of João Pessoa, Campina Grande, Patos, Cajazeiras, and Sousa (State of Paraíba) was developed. Information on the presence of congenital anomalies and cleft lip and palate, gender of neonate, birth-weight (<2.5kg and ≥2.5kg) and mother's age were collected. Data were tabulated with Microsoft Excel software and presented through descriptive statistics (absolute and percentage distributions). In the study period, there were 206367 cases of live birth, with 1916 cases of children with congenital anomalies of which 109 (5.7%) had cleft lip and palate, predominantly males (66%). Regarding birth-weight, 27.5% had <2.5kg. The majority of mothers aged 20-29 years (45.9%). The city of Campina Grande concentrated the highest number of cases (50.5%), with prevalence of 7.36 cases per ten thousand live births. The frequency of cleft lip and palate was 5.2 per 10000 live births. Male children with normal birth-weight are the most affected by cleft lip and palate.

KEY WORDS: ***Epidemiology; Cleft Lip; Cleft Palate; Congenital Abnormalities***

INTRODUCTION

Congenital anomalies are defects present before birth, which can occur at any stage of intrauterine development, modifying shape, structure and/or function of organs, cells or cellular components[1]. Oral clefts are among congenital malformations, which may or may not be associated with other congenital anomalies, and result from the non-closure of frontonasal and maxillary processes of the individual in the first days as an embryo[2], presenting an opening or rupture in the normal mouth characteristics[3].

Cleft lip and palate are among these malformations, causing a modification in the orofacial complex due to a failure in the complete fusion among facial components[4]. These clefts have complex and heterogeneous etiology, with several genes involved, associated to environmental influences, such as smoking[3], alcohol, maternal and paternal age, use of drugs and folic acid deficiency[5]. Oral clefts can be classified as Cleft Lip (CL), Cleft Palate (CP) and Cleft Lip and Palate (CL/P)[6,7].

With prevalence ranging from 1: 700 to 1: 2500 live births worldwide, which may vary according to geographical region, ethnic or racial group, and socioeconomic class[8], cleft lip/cleft palate represents one of the most common malformations[9], affecting about 5% of live newborns[10], which may or may not be associated with syndromes[8].

In Brazil, the Live Birth Information System (SINASC), developed by the Department of Informatics of the Unified Health System (DATASUS), allows knowing the profile of live births throughout the country, including those with oral clefts, contributing to health indicators specific for the entire population[11].

Knowing the distribution of this disease contributes to the development of public policies that allow differentiated care of these individuals, providing improvements in treatment and recovery of these patients, as well as the implementation of

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therapeutic, diagnostic and prevention measures. Therefore, the aim of this study was to evaluate the distribution of the occurrence of cleft lip and/or cleft palate in Brazilian children.

METHODOLOGY

This ecological study was developed with data from the Live Birth Information System (SINASC) of the Department of Informatics of the Brazilian Unified Health System (DATASUS), which are available for consultation (http://datasus.saude.gov.br/informacoes-de-saude/tabnet/estatisticas-vitais). All information recorded between 2011 and 2015, in the main cities of the state of Paraíba (João Pessoa, Campina Grande, Patos, Cajazeiras and Sousa) was collected.

Through a questionnaire, a duly trained researcher (NMA) collected information on the presence of congenital anomalies, occurrence of cleft lip and palate, gender of neonate, birth-weight (<2.5 kg and ≥ 2.5 kg), mother's age (10-19 years, 20-29 years, 30-39 years and 40-49 years) and year of birth. Only live births were included in the analysis. Data were tabulated using Microsoft Excel software (Microsoft Corp., Redmond, WA, USA) and presented using descriptive statistics (absolute and percentage distributions).

RESULT

The frequency of cleft lip or palate or both was 109 cases in 206367 live births, which is 5.2 per 10000 live births. The city with the highest number of cases of live-born children with cleft lip and palate was Campina Grande (50.5%) (**Table 1**).

Regarding gender of neonate, 66% were male, 72.5% had birth-weight ≥2.5 kg and 45.9% of mothers aged 20-29 years (**Table 2**). The gender ratio was 1.9: 1 (male: female).

DISCUSSION

This study aimed to analyze the occurrence of cleft lip and palate in Brazilian children through secondary data from SINASC. It is a national epidemiological surveillance information system that has unique characteristics, available in only few countries in the world, such as: national coverage, electronic data transmission system and availability of disaggregated information[12].

The frequency of cleft lip or palate or both was 109 cases in 206367 live births, which is 5.2 per 10000 live births. In this study, higher prevalence of cleft lip and palate was observed in male children, a result similar to that reported by other authors[6,9,13-15]. Some authors report that the palate merges later in female children, contributing to increase the occurrence of this condition in this population group[16,17]. Research with Taiwanese children demonstrated a higher prevalence of cleft lip with or without cleft palate (CL/P) among boys and cleft palate (CP) among girls[18].

It is noteworthy that the Brazilian Live Birth Information System (SINASC) exclusively records the presence of cleft lip and palate in general, not discriminating cases of CL, CP or CL/P. Therefore, the findings of this research show the situation of live births related to the disease, and it is not possible to determine the distribution according to the type of oral cleft.

It was also possible to verify that most children with cleft lip and palate had normal birth-weight (≥2.5kg), confirming previous findings[19]. However, a study developed in Taiwan showed that the presence of cleft lip and palate was associated with low birth-weight (<1.5 kg). Children with low birth-weight and with cleft lip and palate associated with other congenital malformations are more likely to be born with weight below normal[20,21]. Patients with orofacial clefts have additional risks of malnutrition and anaemia due to feeding problems[6].

Regarding mother's age, the majority were young, under the age of 29, a condition similar to that described in literature[13,22]. However, a study developed in Taiwan[18] found higher occurrence of cases of cleft lip and palate in mothers over the age of 35 years, but without statistical significance. Therefore, there is no consensus in the literature that maternal age represents a risk factor for cleft lip and palate, despite being considered relevant for several chromosomal alterations[23].

The city of Campina Grande showed the highest frequency of cases, representing half of the total recorded and showing the highest prevalence among the cities analyzed, with 7.5/10,000. This result can be justified by the fact that the city is considered a reference for the surrounding municipalities, constituting a health macro-region, congregating 70 municipalities and being a reference, also, to neighboring states.

Regarding the distribution according to year, it was observed that the years 2012, 2013 and 2014 presented equal frequencies, a result similar to that obtained by other Brazilian researchers[24]. This homogeneity and absence of large increases over time may suggest that environmental factors have little influence on the occurrence of these changes.

The presence of this condition may negatively influence the quality of life of individuals, causing important psychological and functional disorders[25], in addition to unfavorably influencing the oral health quality of patients affected[7,15,17,26], vocal resonance[27], aesthetics[22], among other factors.

Limitation of study

This study has certain limitations. First, the Brazilian database did not provide information on

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maternal health, which may play a role in the development of facial cleft deformities[18]. Second, studies developed through health information systems have disadvantages, such as the information bias.

Quality information is essential for health situation analysis and decision-making. Therefore, epidemiological studies aimed at establishing the profile of live-born children with cleft lip and palate provide valuable information to health managers and professionals, contributing to administrative planning actions, allocation of public resources in the health area, being also a clear geographic indicator of the locations that need the construction of care centers for affected individuals in the regions with the highest prevalence, allowing early intervention in this population.

Table 1: Distribution of Brazilian children bore alive with congenital anomalies and cleft lip and palate in the period from 2011 to 2015

City	No. of Live Births	No. of Congenital Anomalies		No. of Cleft Lip with or without Cleft Palate		Prevalence per 10,000 live births
		N	%	N	%	
João Pessoa	96,005	1323	69.1	48	44.0	4.9
Campina Grande	73,329	481	25.1	55	50.5	7.5
Cajazeiras	8905	56	2.9	4	3.7	4.5
Patos	18,923	37	1.9	1	0.9	0.5
Sousa	9205	18	1.0	1	0.9	1.1
Total	206,367	1915	100.0	109	100.0	5.2

Table 2: Distribution of live births with cleft lip and palate according to the year of registration, gender, birth-weight and mother's age

Variables	N	%
Year [109]		
2011	20	18.3
2012	24	22.0
2013	24	22.0
2014	24	22.0
2015	17	15.6
Gender [109]		
Male	72	66.0
Female	37	34.0
Birth-weight (Kg) [109]		
<2.5	30	27.5
≥2.5	79	72.5
Mother's age (Years) [109]		
10 to 19	28	25.7
20 to 29	50	45.9
30 to 39	28	25.7
40 to 49	3	2.8

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CONCLUSION

The frequency of cleft lip and palate was 5.2 per 10000 live births. Male children with normal birth-weight are the most affected by cleft lip and palate.

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REFERENCES

1. Brito VRS, Sousa FS, Gadelha FH, Souto RQ, et al. Congenital malformations and maternal risk factors in Campina Grande-Paraíba. *Rev RENE*. 2010;11(2):27-36.
2. Vanz AP, Ribeiro NRR. Listening to the mothers of individuals with oral fissures. *Rev Esc Enferm*. USP. 2011;45(3):596-602.
3. Beaty TH, Marazita ML, Leslie EJ. Genetic factors influencing risk to orofacial clefts: today's challenges and tomorrow's opportunities. *F1000Res*. 2016;5(2800):1-10.
4. Rahimov F, Jugessur A, Murray JC. Genetics of nonsyndromic orofacial clefts. *Cleft Palate-Craniofac J*. 2012;49(1):73-91.
5. Zeiger JS, Beaty TH. Is there a relationship between risk factors for oral clefts? *Teratology*. 2002;66(3):205-8.
6. Nagalo K, Ouédraogo I, Laberge JM, Caouette-Laberge L, et al. Congenital malformations and medical conditions associated with orofacial clefts in children in Burkina Faso. *BMC Pediatr*. 2017;17(1):72.
7. Filgueira IG, Azevedo ID, Ramalho LS, Gomes PN, Rêgo DM. Quality of life of patients with cleft lip and / or cleft palate: perspective of parents/guardians. Braz Res Pediatr Dent Integr Clin. 2015; 15(1):431-40.
8. Dixon MJ, Marazita ML, Beaty TH, Murray JC. Cleft lip and palate: understanding genetic and environmental influences. *Nat Rev Genet*. 2011;12(3):167-78.
9. Martelli DR, Machado RA, Swerts MS, Rodrigues LA, et al. Non sindromic cleft lip and palate: relationship between sex and clinical extension. *Braz J Otorhinolaryngol*. 2012;78(5):116-20.
10. Maggi A, Scopel JB. Characteristics of a treatment center to people with clefts lip and/or palatal. *Aletheia*. 2011;34(1):175-86.
11. Brasil. Ministério da Saúde. SINASC - Sistema de Informações sobre Nascidos Vivos. 2017. Available from: http://datasus.saude.gov.br/sistemas-e-aplicativos/eventos-v/sinasc-sistema-de-informacoes-de-nascidos-vivos. Accessed 04 Jan 2017.
12. Luquetti DV, Koifman RJ. Quality of birth defect reporting in the Brazilian Information System on Live Births (SINASC): a comparative study of 2004 and 2007. *Cad Saúde Pública*. 2010;26(9):1756-65.
13. Carvalho PHP, Machado RA, Reis SRA, Martelli DRB, Dias VO, Martelli Júnior H. Parental age is related to the occurrence of cleft lip and palate in Brazilian populations. Braz J Oral Sci. 2016; 15(2):167-70.
14. Fleurke-Rozema JH, van de Kamp K, Bakker MK, et al. Prevalence, diagnosis, and outcome of cleft lip with or without cleft palate in the Netherlands. *Ultrasound Obstet Gynecol*. 2016;48(4):458-63.
15. Rivaldo EG, Russomano RP, Vargas-Ferreira F, Pinto JHN, et al. Impact of cleft lip and palate on oral health-related quality of life (OHRQOL) in Brazilian patients. *Pesq Bras Odontoped Clín Integr*. 2017;17(1):e3609.
16. Bunduki V, Ruano R, Sapienza AD, Hanaoka BY, et al. Prenatal diagnosis of lip and palate cleft: experience of 40 cases. *Rev Bras Ginecol Obstet*. 2001;23(9):561-6.
17. Amobi EO, Mafeni J, Adekoya-Sofowora CA. Perceived and normative needs of facial cleft patients seen in Nigeria. *Pesq Bras Odontoped Clin Integr*. 2018;18(1):e3841.
18. Lei RL, Chen HS, Huang BY, Chen YC, et al. Population-based study of birth prevalence and factors associated with cleft lip and/or palate in Taiwan 2002-2009. *PLoS One*. 2013;8(3):e58690.
19. Figueirêdo CJR, Vasconcelos WKS, Maciel SSSV, Maciel WV, et al. Prevalence of oral clefts in the State of Rio Grande do Norte, Brazil, between 2000-2005. *Rev Paul Pediatr*. 2011;29(1):29-34.
20. Kesande T, Muwazi LM, Bataringaya A, Rwenyonyi CM. Prevalence, pattern and perceptions of cleft lip and cleft palate among children born in two hospitals in Kisoro District, Uganda. *BMC Oral Health*. 2014;14:104.
21. Sarkar S, Patra C, Dasgupta MK, Nayek K, et al. Prevalence of congenital anomalies in neonates and associated risk factors in a tertiary care hospital in Eastern India. *J Clin Neonatol*. 2013;2(3):131-4.
22. Gardenal M, Bastos PRHO, Pontes ERJC. Predominance of orofacials fissure diagnosed in refference service in resident cases in Mato Grosso do Sul State. *Arq Int Otorrinolaringol*. 2011;15(2):133-41.
23. Martelli DRB, Cruz KW, Barros LM, Silveira MF, et al. Maternal and paternal age, birth order and interpregnancy interval evaluation

 DOI: http://dx.doi.org/10.4314/ijmu.v13i1.3

for cleft lip-palate. *Braz J Otorhinolaryngol*. 2010;76(1):107-112.
24. Sousa GFT, Roncalli AG. Orofacial clefts in Brazil and surgical rehabilitation under the Brazilian National Health System. *Braz Oral Res*. 2017;31:e23.
25. Sabino MFPA, Katz CRT, Bezerra NSL, Monteiro JLGC. Occurrence of oral habits and malocclusion in children with cleft lip and/or palate. *Pesq Bras Odontoped Clín Integr*. 2012;12(2):237-43.
26. Vitor LLR, Rodrigues IR, Mello BZF, Carrara CFC, et al. Use of ICDAS-II criteria in the detection of caries lesion in cleft lip and palate patients. *Braz Res Ped Dent Integr Clin*. 2014;14(2):107-114.
27. Raposo-do-Amaral CE, Kuczynski E, Alonso N. Quality of life among children with cleft lips and palates: a critical review of measurement instruments. *Rev Bras Cir Plást*. 2011;26(4):639-44.

 DOI: http://dx.doi.org/10.4314/ijmu.v13i1.3