International Journal for Scientific Research (IJSR)

المجلة الدولية للبحوث العلمية

Vol. (3), No. (7) July 2024 الإصدار (3)، العدد (7)

Pattern of Cleft Lip and Palate at Birth in Zawia City: Retrospective Study at Zawia Medical Center, Libya

Ruwaida Mira
Department of Oral Medicine and Oral Pathology, Faculty of Dentistry, University of Zawia, Zawia, Libya

Rema Hwas
Department of Orthodontic, Faculty of Dentistry, University of Zawia, Zawia, Libya
r.hawas@zu.edu.ly

Mohamed Rohuma
Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, University of Zawia, Zawia, Libya

Abstract

Background: Birth defect is widely used as a term for congenital anomalies which include the craniofacial defects in newborns. The annual prevalence of infants born with cleft lip (CL) with or without or cleft palate (CP) is 10 in 10,000. Children with cleft lip and palate may have serious complications that affect their development; therefore, this study was designed to determine the overall prevalence of cleft palate, lip, and cleft palate through retrospective study.

Methods: The aim of this study to conduct a retrospective record-based research that covers the west area of Libya. We included all the valid complete live birth records, from the Zawia Medical Center (ZMC), in the period covering 2016 to April 2022 using medical records of 17299 patients with CL/CP. Data regarding cleft type, sex, blood group, neonatal body weights, pregnancy periods, age of their mothers and associated syndromes were collected and analyzed.

Results: The data utilized in this study were obtained from the birth data registry at the ZMC covering the period between January 2016 and December 2022, the total number of documented orofacial cleft cases with a rate of 0.87/1000 per 1000 live births with mild male gender predominance (53.3%). In contrast with Cleft palate (CP) which have a higher prevalence in female babies. Our results indicated that preterm infants who are having low birth weight (46.7%) and blood group O+ (40%) are more commonly affected, and separately the babies born by mothers with older age have an increased risk of combined CL/CP anomalies (3 out of 17). Some perinatal babies with cleft lip and palate tended to have other defects and /or syndromes (4 out of 17) especially peirrie Robin Syndrome (50%).

Conclusion: Due to the high prevalence of oral clefts such as cleft palate, cleft lip, and cleft lip and palate; health system needs to take precautionary measures to reduce the number of patients through their actions on the modifiable and preventable factors, as well as diagnostic and therapeutic measures to reduce its consequences in such children.

Keywords: Cleft Lip, Cleft palate, Gender, Blood group, Birth defects, Syndromes, Prevalence.

Introduction

Congenital anomaly is deformity present prior birth, which can execute at any phase of intrauterine development, modifying shape, construction and/or function of organs, cells or cellular components [(1)].

It was recorded that, with increases in world population, and equal increases in life expectancy, there will be an apparent increase in the numbers of people living with oro-facial clefts [(2)].

Cleft lip and palate are through these disfigurations, causing a transformation in the orofacial complex due to a failure in the complete incorporation between facial components [3].

The child and the family often undergo serious psychological problems and socio-economic impact. Each of CL and/or CP cases requires various surgical procedures and combined medical treatments [4,5].

These clefts have sophisticated and heterogeneous etiology, with different genes involved, accompanying to environmental influences, such as smoking [6], alcohol, maternal and paternal age, use of drugs and folic acid deficiency [7]. Oral clefts can be classified as Cleft Lip (CL), Cleft Palate (CP) and Cleft Lip and Palate (CL/P) [8,9].

Material and Method

A retrospective study was carried out in Zawia Medical Center in the Western region of Libya, based on patient medical file from January 2016 to April 2022, the data were collected by four researchers using the following form,

No	mother name	Date of birth	Mother age at birth	Child Gender	Type of cleft	Side of cleft	Body weight	Child blood group	Delivery month	Other abnormality	Risk factor	other
1												

Cleft lip= **CL**, Cleft palate= **CP**, Cleft lip and palate= **CLP**, Unilateral= **Uni**, Bilateral= **Bil,** Right=**Re,** Left= **Le**

All live births in this period were included in this study, the patient's data were clearly documented in the patient file except the side of the cleft, which is unfortunately not mentioned in many files. the patient files with insufficient data were excluded from this study.

International Journal for Scientific Research (IJSR)
المجلة الدولية للبحوث العلمية
IJSR
Vol. (3), No. (7) July 2024 الإصدار (3)، العدد (7)

Results

A total of 17299 child was born in Zawia Medical Center [ZMC], Zawia, Libya from1st of January 2016 to April 2022. 15 children were born of orofacial clefts, with a rate of 0.87/1000 live birth. the number of males effected were slightly higher 8 (53.3%) than females 7(46.7%). Regarding the type of cleft, 5 children 33.3% had cleft lip, 7 (46.7) had cleft palate, and only 3 (20%) had both clefts, lip and palate. Unfortunately, the side of the cleft as well as the cleft being unilateral or bilateral were not mentioned in the children's medical records.

Table 1

Type of cleft	Number of affected children		
	Cases (%)	Male (%)	Female (%)
Cleft lip (CL)	5 (33.3%)	3 (60%)	2 (40%)
Cleft palate (CP)	7 (46.7%)	2 (28.5%)	5 (71.4%)
CL& CP	3 (20%)	3 (100%)	0 (0%)

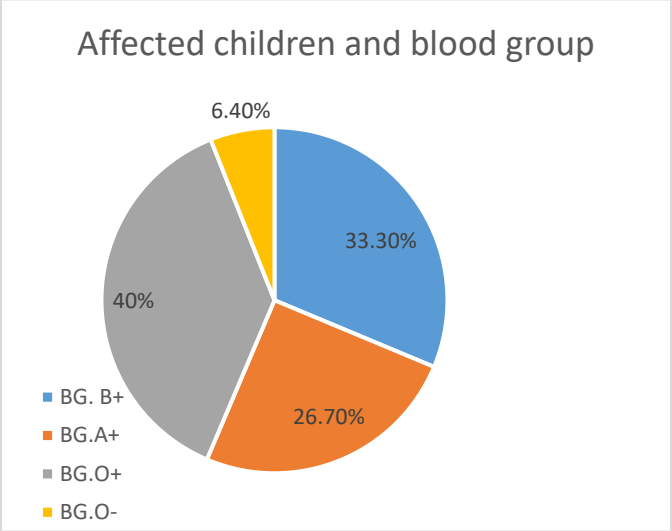
According to the mothers age and relevant of affected children at birth, only 1 mother (6.7%) was below the age of 20 years, 2 mothers were over 40 years (13.3%) , 4 mothers were aged between 20-29 years (26.7%) and 8 mothers were in their 3rd decade (53.3%) at the birth of the affected child.

Table 2

		No.	%
Child gender	Male	8	46.7%
	Female	7	53.3%
Child birth B. weight	< 2.5 kg	7	46.7%
	2.5-4 kg	7	46.7%
	>4 kg	1	6.6%
Delivery month	Preterm	4	26.7%
	Term	10	66.7%
	Not found	1	6.6%

As for affected children body weight, 7 were less than 2.5 kg, only one child was over than 4 kg, while 7 children weighed between 2.5- 4 kg.

According to the blood group of the affected children, 6 children were found to be O+ve (40%), 5 children were B +ve (33.3%), 4 were A +ve (26.7%)**,** and, 6.4% of the children were found to be O-ve



Most of the affected children were born in the 9th month 10, (66.6%) and only 4 were preterm babies. In addition, 4 children were born with congenital abnormalities (26.7%), such as peirrie Robin Syndrome, Turner Syndrome, Ancephaly syndrome, 2 of them were male and had a CLP, and 2 female had a CP only with peirrie Robin Syndrome specifically. All of these cases lived for a very short period, ranging from two days to less than a month.

Discussion

CL and CP are the most remarkable human congenital anomalies at a rate of one baby of every 1000 live birth [(10)] .CL/CP is the second most common birth defects after Down syndrome at 10.48 cases per 10,000 births [(11)] .

This study aimed to assess pattern and factors associated with CL/CP among children of the [ZMC], Zawia, Libya. A total of 17,299 medical records registered at this center between 2016 and 2022 were evaluated. The article revealed that most children had CP only, while less than quarter of them had both CL and CP. This is consistent with what was reported by Mai et al. [12].

For gender disparity, the prevalence of the disease in our study distributed almost equally in both genders with slightly predominant in boy infants. The higher prevalence among male infants may be partly due to higher sensitivity to environmental pressure as well as gene mutations. [13,14]. On other hand, CP which occurs more in females (71.4%) than in males (28.5%). Overall, our results were also supported by some epidemiological studies. There are several surveys like South Africa, China and Brazil showed that cleft lip and cleft lip and palate were more common in male infants, and cleft palate was more common in female infants. [14] The reason for this association of CP with females is that the secondary palate fusion is delayed in the female embryo, so the pregnant women are subject to a longer period of susceptibility to teratogenic factors [15,16].

Regarding the mother's age, our results indicate that infants with older parents who are older than 35 years were at a higher risk of cleft lip and palate. In terms of syndromic clefts, 4 children were born with congenital abnormalities (26.7%) such as peirrie Robin Syndrome, Turner Syndrome and ancephaly syndrome. Unlike this study, Monlleó et al. found that the syndromic cleft group outweighed the non-syndromic cleft group [15]. In this study, the majority of perinatal infants with cleft lip and palate were complicated by other defects, which have affected their survival rates. On the other hand, a study in the Chilean population presented evidence of an association between nonsyndromic CLP and males, owing to a variation in the MSX1 gene located in chromosome [13]. Of the syndromes with known genetic causes associated with CL/P, the Pierre Robin sequence is commonly seen in the CP type,

and is associated with an altered expression of the SOX9 gene. [16] Among the syndromes or malformations identified in our study, the Pierre Robin sequence represented 50 % of all the cases of syndromic cleft patients as two of them were Peirrie Robin syndrome.

As for its relationship with childbirth weight, the current study revealed that nearly half of the children with cleft defects (46.7 %) were born underweight, while <6% were born with overweight. In terms of delivery month, quarter of them were preterm babies which consistent with previous reports.

Considering blood group of the cleft group children, blood group O+ was the dominant subtype (40 %) followed by B+ (one third of them) then A+, none of them has AB blood group which is in consistence with Alrasheedi et al. On other hand, other studies such as Ghaib et al. stated that AB blood group is the most prevailing subtype associated with CL and/or CP, while group O is the least associated. This may be because of its association with other genetic makeup (17).

The strength of our research is that the Zawia medical center is the main hospital that admits most of medical cases of the west area of the country target area and treating them without cost. The main limitations of the study are the fact that not all birth of the west area were included, since some of them are excepted to getting born outside the area hospitals as well as lack of electronic medical records. Risk and environmental factors such as the effect of radiation, refinery factory, war, gestational diabetes, irregular pregnancy follow-up, consanguinity and smoking have not been investigated. Measures should be planned for modifiable/preventable factors.

Conclusion

Birth anomalies in terms of CL/P are highly prevalent among infants. In summary, this study highlights the epidemiological profiles and distribution of cleft group defects in the west area of Libya. Most of CL/P infants of ZMC records were males, with CP has mild female preponderance. Our results indicated that preterm infants who are having low birth weight and blood group O+ are more commonly affected, and separately the babies born by mothers with older age have an increased risk of such anomalies. Some perinatal babies with cleft lip and palate tended to have other defects and /or syndromes.

References

1. Brito VRS, Sousa FS, Gadelha FH, Souto RQ,et al. Congenital malformations and maternal risk factors in Campina Grande-Paraíba. *RevRENE*. 2010;11(2):27-36.
2. Arpino C, Brescianini S, Robert E, Castilla EE, Cocchi G, Cornel MC,et al. Teratogenic effects of antiepileptic drugs: Use of an International Database on Malformations and Drug Exposure (MADRE). Epilepsia.2000;41(11):1436-43.
3. Rahimov F, Jugessur A, Murray JC. Genetics of nonsyndromic orofacial clefts. *Cleft Palate-Craniofac J*. 2012;49(1):73-91.
4. Obuekwe O, Akapata O. Pattern of cleft lip and palate in Benin City,Nigeria. Cent Afr J Med. 2004;50(7-8):65-9.
5. Nasreddine G, El Hajj J, Ghassibe-Sabbagh M. Orofacial clefts embryology,classification, epidemiology, and genetics. Mutat Res Rev Mutat Res. 2021; 787:108373.
6. Beaty TH, Marazita ML, Leslie EJ. Genetic factors influencing risk to orofacial clefts:today's challenges and tomorrow'sopportunities. *F1000Res*. 2016; 5(2800): 1-10.
7. Zeiger JS, Beaty TH. Is there a relationship between risk factors for oral clefts?*Teratology*. 2002; 66(3): 205-8.
8. 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.

9. 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
10. Abdullah N A, Sultan F A, Hussam A A, Saif Daham, Zaid A, et al. The Prevalence and Risk Factors of Cleft Lip and Palate in Northern Region of Saudi Arabia. Am Jour Otolaryngology and Head and Neck Surgery. 07 Oct 2021.
11. Kirby RS. The prevalence of selected major birth defects in the United States. Semin Perinatol. 2017;41(6):338-44.
12. Mai CT, Isenburg JL, Canfield MA, Meyer RE, Correa A, Alverson CJ, Lupo PJ, et al. National population-based estimates for major birth defects, 2010–2014. Birth Defects Rese. 2019; 111(18): 1420-35.
13. Croen LA, Shaw GM, Wasserman CR, et al. Racial and ethnic variations in the prevalence of orofacial clefts in California, 1983-1992. Am J Med Genet 1998; 79:42–7.
14. Yingxian Z, Huazhang M,Qinghui Z,Bing L, Degang W, Xiaolin Yu, Haisheng Wu, et al. Prevalence of cleft lip and/or cleft palate in Guangdong province, China,2015–2018: a spatio-temporal descriptive analysis. BMJ Open 2021; 11: e046430.
15. Monlleó IL, Barros AG, Fontes MI, Andrade AK, Brito GM, Nascimento DL, et al. Diagnostic implications of associated defects in patients with typical orofacial clefts. J Pediatr (Rio J). 2015;91(5):485-92.
16. Errari-Piloni C, Barros L, Jesuíno F, Valladares-Neto J. Prevalence of cleft lip and palate and associated factors in Brazil's Midwest: a single-center study. Braz Oral Res. 2021;4(35):26.
17. Ghaib NH, Alhuwaizi AF. Cleft lip and/or cleft palate in relation to blood grouping. Iraqi Dental J. 2002; 30:67-70.