CONSANGUINITY AND THE OCCURRENCE OF CLEFT LIP AND CLEFT PALATE

Subhashini R, Abdul Wahab P U, Santosh Kumar MP

1. Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai. Email: 151804005.sdc@saveetha.com

2. Professor, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai. Email: abdulwahab@saveetha.com

3. Reader, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai. Email: santhoshkumar@saveetha.com

*Corresponding Author:
Abdul Wahab P U,
Professor,
Saveetha Dental College and Hospitals,
Saveetha Institute of Medical and Technical Sciences,
Saveetha University,
Chennai

Running Title: Cleft lip and palate

ABSTRACT

The etiology of cleft lip and palate is multifactorial. It can be genetic or environmental or both. Consanguineous marriage had been associated with Cleft lip and cleft palate. The aim of our study was to assess the association between consanguinity and the occurrence of Cleft Lip and cleft palate. In this retrospective study, records of all patients who underwent surgery for cleft lip and cleft palate in the Department of Oral and Maxillofacial surgery, Saveetha dental college and hospital, Saveetha University, Chennai from July 2019 to March 2020 were assessed. Hospital case records were thoroughly analysed for family history of cleft lip and cleft palate, consanguineous marriages. Extracted data was tabulated, analysed with SPSS and results obtained. Out of 110 Cleft Lip and cleft Palate patients who underwent surgery, 62 patients had cleft palate (56%) and 48 patients had Cleft lip (44%) and male babies were more affected than female babies. Consanguinity had a strong association with cleft lip and cleft palate patients and the results were statistically significant (p<0.05). From the present study it can be concluded that consanguineous marriages can be considered as a risk factor for the occurrence of non syndromic oral cleft. This enables preventive strategies for counselling regarding the occurrence of craniofacial anomaly.

KEY WORDS: Consanguineous marriage; Cleft Lip; Cleft Palate; Syndrome; Genetic; risk factors

How to cite this article: Subhashini R, Abdul Wahab PU, Santosh Kumar MP (2020): Consanguinity and the occurrence of cleft lip and cleft palate, Ann Trop Med & Public Health; 23(S22): SP232301. DOI: http://doi.org/10.36295/ASRO.2020.232301
INTRODUCTION

The cleft is a congenital deformity occurring during embryological development. It is a fissure or elongated opening due to failure of fusion. Cleft in the craniofacial region are the anatomical distortion of the face and cranium either due to deficiency or the excess of the tissues (Mathes, 2008; Jesudasan, Wahab and Sekhar, 2015). Cleft may involve bone and soft tissues, also it results in disfigurement and it damages the tissues. It affects psychological development and it affects the entire family.

The corrective measures of the cleft lip and or cleft palate begins at the age (Mp and Rahman, 2017) of 10 weeks and they have to undergo multiple surgeries depending upon the severity and the extent. Beginning from primary cleft lip repair till cosmetic surgery of the face, cleft patients require a multidisciplinary approach.

The incidence of cleft in Indian Subcontinent has been increasing and it is estimated from 27000-33000 Clefts years (Mossey and Little, 2009; Christabel et al., 2016). Most common cleft in the craniofacial region is the cleft lip and cleft palate (CLP). It can be an isolated cleft lip (CL) or an isolated Cleft palate (CP) or combined (CLP).

The etiology of cleft is multifactorial, it can be genetic or environmental or both (Murray, 2002). According to previous literature, consanguinity plays a major role in the occurrence of cleft lip and cleft palate. The objective of this study was to evaluate the association between consanguinity and the occurrence of cleft lip and palate.

MATERIALS AND METHODS

In this retrospective study, records of all patients who underwent surgery for cleft lip and cleft palate in the Department of oral and maxillofacial surgery, Saveetha Dental College and hospital, Saveetha University, Chennai from July 2019 to March 2020 were assessed. Hospital case records were thoroughly analysed for family history of cleft lip and cleft palate, consanguineous marriages. Got Ethical clearance from the college ethical committee and the ethical clearance number is SDC/SIHEC/2020/DIASDATA/0619-0320. The records of 110 cleft patients were retrieved and they were categorised into cleft lip (CL) and Cleft palate (CP). Details retrieved were demographic details, type of clefts, and the severity. Retrieved data was tabulated and statistical analysis was performed using the SPSS software (version 20.0; SPSS, Chicago, IL, USA) and results obtained. Categorical variables were expressed as frequency and percentage. The chi-square test was used to test the association between the categorical variables with P- values < 0.05 were considered as statistically significant.

RESULTS AND DISCUSSION

In our study out of 110 cases, 62 patients had cleft palate (56%) and 48 patients had Cleft lip (44%). Out of 48 cleft lip patients, 29 patients were male babies (61%) and 19 were female babies (39%). Out of 62 Cleft Palate cases, 41(66%) were males and 21(34%) were female babies. In our study we found that male babies were affected by cleft more than female babies (Figure 1). As far as consanguinity was concerned, 31 out of 41 male cleft palate patients (75.6%) and 16 out of 29 female cleft palate babies (55%) had the history of consanguineous marriage of their parents and the results were statistically significant (p<0.05). 25 out of 29 male cleft lip babies (86.20%) and 11 out
of 19 female cleft lip babies (57.89%) had the history of consanguineous marriage of their parents and the results were statistically significant (p<0.05) (Figure 2).

Marriage between two blood relatives is called consanguineous marriage. Compared to India, Consanguineous marriages are most common in other parts of the world. Genetic factors include familial recurrence and related maternal history pre and post conception. Maternal history includes parental consanguinity and exposure to environmental risk factors in the first trimester of gestation (Mitchell et al., 2002; Packiri, Gurunathan and Selvarasu, 2017). According to previous literature parental consanguinity plays a major role in the occurrence of cleft lip and palate (Sabbagh et al., 2015; Ebadifar et al., 2016; Kumar, 2017a). So it is fundamental to study parental consanguinity because about 10.4% of the world population is married to a biological relative (Bittles and Black, 2010; Patil et al., 2017). This study demonstrates the association between cleft lip and cleft palate and consanguinity. There was no significant association when Cleft lip and cleft palate was considered as one group. But when compared with non cleft babies, the difference in the occurrence of cleft with consanguinity was significant.

Our study is a hospital based study and it does not include various ethnic groups or various geographic data. We found that cleft palate was more frequent than cleft lip, which is in accordance with the previous literature. (Sabbaghet al., 2015; Rao and Santhosh Kumar, 2018; Silva et al., 2019). As the degree of consanguinity increases, the abnormality of genes decreases. (M Kingston, 2002; Santhosh Kumar and Sneha, 2016; Abhinav, Sweta and Ramesh, 2019). In our study we did not assess the degree of consanguinity. A south Indian study, conducted in Andhra Pradesh also showed the result of correlation of cleft cases with parental consanguinity (Kumar, 2017b; Abhinav et al., 2019). In addition to consanguinity, poor nutrition also plays an important role in the occurrence of cleft. Cleft Lip and cleft Palate is more frequent in the craniofacial region. We found the same results in our study.

The Iranian study also showed that consanguinity is a risk factor in Oral cleft (Azimi and Karimian, 2010; Abhinav et al., 2019) (Abhinav, Sweta and Ramesh, 2019) The consanguineous parents also had a high risk of cleft lip. Parental consanguinity was found to be 28% in an Iranian study (Christensen et al., 1996; Patturaja and Pradeep, 2016). Study in Denmark, China also showed increased birth defects with parental consanguinity (‘Population-based birth defects surveillance data from selected states, 2000-2004’, 2007; Oyen et al., 2009; Jain et al., 2019).

Studies have suggested that many genes (Marimuthu et al., 2018) and environmental factors are associated with cleft lip and cleft palate. (Mitchell et al., 2002; Vieira, 2008). In addition to this, consanguinity has been strongly implicated in cleft lip and cleft palate (Rahman and Mp, 2017). The risk of congenital disorders is about 5-8% in consanguineous marriages (Kanaan, Mahfouz and Tamim, 2008).

CONCLUSION

From the present study it can be concluded that consanguineous marriages can be considered as a risk factor for the occurrence of non syndromic oral cleft. It is essential to collect proper family history to determine the risk. This enables preventive strategies for counselling regarding the occurrence of craniofacial anomaly.
CONFLICT OF INTEREST: None declared.

REFERENCES


Subhashini et al (2020): Consanguinity and the occurrence of cleft


Figure 1: Bar chart depicts the association between Consanguinity and the gender affected where Green colour represents Consanguinity and Blue colour represents Non-consanguinity. X-Axis denotes Gender and Y-Axis denotes The number of babies born due to consanguineous and Non-consanguineous marriages. Thus it is evident that there is a predilection for Male babies for the occurrence of cleft in consanguineous marriages. Chi square value 8.000, p=0.04 and hence it is statistically significant.
Figure 2: Bar chart shows the association between Consanguinity and incidence of Cleft lip/palate where Blue colour represents Cleft lip and Green colour represents Cleft Palate. X- Axis denotes Consanguineous and Non-Consanguineous marriage and Y- Axis denotes Number of Babies born with Cleft Lip/Palate. Chart shows there is a significant association between Consanguinity and Cleft Lip and Cleft Palate. Chi square value 9.000  p=0.04 and hence it is statistically significant. Thus it is evident that occurrence of Cleft Lip/Palate was more in Consanguineous marriages than in non-Consanguineous marriages.