

Demographic Profile of Patients with Cleft Lip and Palate Anomaly: 15-year Experience from a Tertiary Care Hospital and Teaching Institute in Wardha District of Maharashtra, India

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ABSTRACT

Background: Cleft lip and palate (CLP) is considered to be a congenital defect involving the orofacial region. This defect affects the esthetics, speech as well and psychological well-being of a person. The study was performed to analyze the prevalence of different types of cleft deformity reported in a tertiary care hospital which would aid in spreading awareness and thereby reducing the prevalence of this congenital defect.

Aim: To study the demographic profile of patients with CLP in the Wardha region.

Materials and methods: A single-center retrospective cross-sectional study was performed. The patients with cleft deformity report under the "Smile Train Project" under the Department of Orthodontics and Dentofacial Orthopedics along with the Department of Oral and Maxillofacial Surgery. The data retrieved included the name of the patient, age, gender, residential address, contact details, and type of cleft. This data was segregated focusing on the gender and type of cleft as per the concern of this study. The datasets were then entered in the Microsoft Excel sheet and the statistical graphical representation was done using Microsoft PowerPoint.

Results: In the present study we tried to find out the profile of CLP in the local population. We reported the high prevalence of this orofacial deformity among the population of this area.

Conclusion: The data from the present study will help to provide a deeper insight into the burden of CLP anomaly. Based on the data obtained from the present study, future research can be conducted, and cleft-care improvement outcomes can be measured.

Clinical significance: There are several etiological factors that are responsible for the development of CLP. Also, due to a lack of awareness regarding this, there is an increased prevalence of this defect. In India, due to a lack of knowledge regarding cleft anomaly, poverty, and social stigma, many patients do not report to the hospitals, and hence, there is a need to spread awareness which would encourage people to access the healthcare facilities at an early age and would reduce the complications in later stages.

Keywords: Cleft lip and palate, Congenital defect, Demographic profile, Esthetic, Prevalence.

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INTRODUCTION

Cleft lip and palate (CLP) is one of the most common birth defects involving the orofacial region.¹ The congenital defects are developed due to errors in morphogenesis which are presented by structural defects involving one or more systems. There are various types of cleft involving the parts of the orofacial region at varying extents. The cleft may be unilateral or bilateral. There are various factors that contribute to the development of CLP. It involves a combination of genetic with environmental factors. The use of anticonvulsant drugs is contraindicated in women during pregnancy because it may lead to congenital cleft in the developing baby. The other factors include vitamin A deficiency, folic acid deficiency, traumatic stress during pregnancy, and lack of inherited developmental forces that may lead to cleft.² There are several complications associated with this defect which involve speech difficulty, difficulty in eating, increased risk of ear infections, dental problems, and esthetic disharmony.² A multidisciplinary approach is needed for the management of these patients which includes dental healthcare, speech pathologists, genetics, audiology, nursing care, and psychology. Certain studies suggest that worldwide, >10 million people have orofacial cleft and the incidence is 0.8–1.6/1,000 live births.³

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When compared to studies performed in other countries, the incidence rate of orofacial cleft in South Africa is 0.3/1,000 live births, for Nigeria the incidence is 0.5/1,000 births,⁴ and for Ethiopia is 0.5/1,000 live births.⁵ Also certain studies have proven that in South Africa, there is a predominance of CLP among the black population.⁶ A study performed to analyze the prevalence in China reveals an incidence of 7.55/10,000 perinatal infants,⁷ for Taiwan, Japan the incidence is 7.28/1,000 live births,⁸ Ghana, Kumasi it is 1.31/1,000 births,⁹ for the Philippines is 1.94/1,000 births,¹⁰ and studies from Pakistan shows the incidence of 1.91/1,000 live births.¹¹

The lowest incidence is seen among the native American tribes of Montana, the United States of America, that is, 1:2076.¹² Also comparing with different statistical data from various regions, study of Andhra Pradesh reveals an incidence of the cleft is 1.09 in every 1,000 live births,¹³ for Karnataka and Kerala the incidence is one in 700 live births¹⁴ for Mysore the incidence is 0.76/1,000 live births,¹⁵ for rural Gujarat it is 0.73/1,000 live births. In India, it has been observed that lack of awareness and reporting of congenital cleft lip and/or plate is due to poverty, social stigma, inaccessibility to medical care, and low literacy rate among the population. Due to this, the exact prevalence of this defect is not available. The only way to collect the prevalence is by performing a hospital-based survey. Considering all these aspects, this study aims to present the descriptive demographic profile of different types of CLP in the tertiary care hospital and teaching institute in the Wardha district of Maharashtra, India.

Rationale

Although cleft anomaly is a common birth defect involving the orofacial area, there are no descriptive data available for this region. Moreover, no research studies addressing the gender-based prevalence of different types of cleft are evident. There is a need to bridge the knowledge gap regarding the prevalence of the defect which will ultimately aid in spreading awareness and thereby encouraging people to access healthcare facilities to cure the defect. Gaining knowledge regarding the profile for this congenital defect would help in eliminating the etiological factors at an earlier stage and thereby reduce the incidence of cleft in this concerned region.

Aim

To study the demographic profile of orofacial cleft and present a gender-based prevalence of types of cleft in the tertiary care hospital of Wardha district of Maharashtra.

Table 1: Total number of patients with different types of cleft (with percentage) (original)

	Type of cleft	Number of patients
1	RUCLP	224 (17.17%)
2	LUCLP	401 (30.75%)
3	BCLP	294 (22.54%)
4	R-L+A	78 (5.98%)
5	L-L+A	114 (8.74%)
6	B-L+A	27 (2.07%)
7	CP	103 (7.89%)
8	Ant HP	5 (0.38%)
9	Only SP	20 (1.53%)
10	Only uvula	6 (0.46%)
11	SP+U	20 (1.53%)
12	Orofacial	8 (0.61%)
13	Others	22 (1.68%)

Objectives

- To analyze the clinical and demographic profile of CLP.
- To present the prevalence of various types of clefts that occur involving the orofacial region in varying extents.
- To present data focusing on the gender-based prevalence of types of clefts for this region.

MATERIALS AND METHODS

A single-center cohort retrospective cross-sectional study was performed. Sharad Pawar Dental College and Hospital, Wardha, India has been a part of "Smile Train Express" since the year 2006, which is a specialized center for patients suffering from orofacial cleft under the Department of Orthodontics and Dentofacial Orthopedics in collaboration with the Department of Oral and Maxillofacial Surgery of this institute.

The data of the patients who reported cleft from the years 2006–2014 was retrieved from the outpatient department (OPD) register. The Smile Train Express also has a centralized online portal on which the data for every patient is updated on a regular basis. This portal was also accessed to retrieve the data of the patients who reported from the year 2015–2021. The data retrieved included the name of the patient, age, gender, residential address, contact details, and type of cleft. This data was segregated focusing on the gender and type of cleft as per the concern of this study. The data sets were then entered into a Microsoft Excel sheet and the statistical graphical representation was done using Microsoft PowerPoint.

Statistical Analysis

A total of around 1,600 patients were reported with a defect of the orofacial cleft from the year 2006–2021. The records of some patients were found to be missing since for some the type of cleft wasn't mentioned, and for some the demographic details were missing. So, all data of 1,304 patients is retrieved by accessing the portal of Smile Train Express and the OPD records from the Department of Orthodontics and Dentofacial Orthopedics. Out of this, there were 702 male and 602 female patients who reported to the tertiary healthcare hospital with defect cleft from year 2006–2021. The analytical study that is performed for this region depicts the number of patients with all the different types of cleft (Table 1). Also, the graphical representation showing the overall prevalence of all the types of cleft is presented in Figure 1 with the

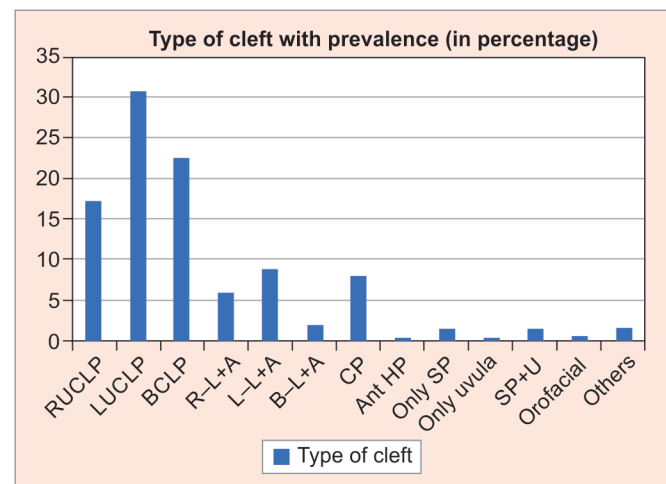


Fig. 1: Graphical representation of the overall prevalence of all types of cleft (original)

X-axis representing the type of cleft and the Y-axis representing their prevalence in percentage (Fig. 1).

These data clearly depict that the prevalence of left unilateral cleft lip and palate (LUCLP) is the highest among all types of clefts whereas the prevalence of cleft of anterior hard palate (Ant HP) is least.

The various types of clefts under which the data is classified include the following:

- Right unilateral cleft lip and palate (RUCLP).
- Left unilateral cleft lip and palate (LUCLP).
- Bilateral cleft lip and palate (BCLP).
- Cleft of right-lip and alveolus (R-L+A).
- Cleft of left-lip and alveolus (L-L+A).
- Cleft palate only (CP).
- Cleft of anterior hard palate (Ant HP).
- Cleft of only soft palate (only SP).
- Cleft of uvula (only uvula).
- Cleft of soft palate and uvula (SP+U).
- Cleft of orofacial region (orofacial).
- Others.

RESULTS

The gender-based analysis of all the types of cleft is being performed and the results for the same are presented (Tables 2 and 3).

The graphical representation which shows the profile of all the types of cleft in both the gender is presented. The X-axis represents the type of cleft and the Y-axis represents the prevalence of these in percentage (Fig. 2).

DISCUSSION

This cross-sectional study was performed and data was collected from the year 2006–2021. In this data, patients from both genders from all age-groups, and from all religions were included which provided the prevalence profile of the cleft for this region. The worldwide incidence of CLP anomaly is 0.8–1.6/1,000 live births.³ In India, Mossey and Little estimated from various multicentric studies across the country that the incidence of CLP ranges from around 0.93 to 1.3 for CLP.¹⁶ A study performed in the United

States of America suggests that there are certain factors that alter the occurrence of cleft which includes residence, birthplace, and metropolitan and nonmetropolitan areas.¹⁷ Also, the major etiologic factor for this anomaly is genetic and the main reason behind this is found to be a high percentage of the consanguineous marriage of the parents of the affected persons which is more common in countries like Bangladesh and Pakistan.¹⁸ These defects not only make abnormal changes in the appearance of the neonate but also cause a lot of stress and psychological problems for the patients and their families. Also, a study from Ethiopia suggests that a maternal age of 25 or less poses a higher risk of developing orofacial cleft than a maternal age above 25 years.⁵

Moreover focusing on the demographic part of different types of cleft anomaly, the data from various countries and also among different states of India is retrieved and discussed as follows.

Cleft lip and Palate (CLP)

This study which was performed for the tertiary care hospital of Wardha, Maharashtra, India gives a total count of 70.46% cases with CLP (RUCLP + LUCLP + BCLP) which is similar to the study revealing similar results from year 2015 to 2018 in

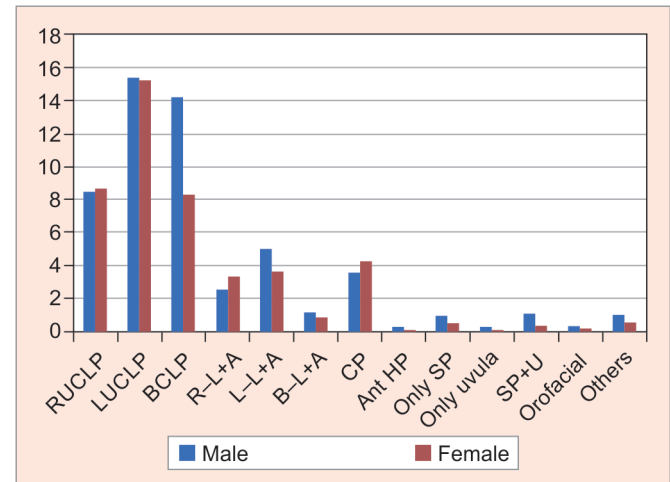


Fig. 2: Graphical representation of statistical data showing gender-wise prevalence of all the types of cleft (original)

Table 2: Number of male patients with different types of cleft (original)

Male		
Type of cleft	Number of patients	
1	RUCLP	111 (8.51%)
2	LUCLP	201 (15.41%)
3	BCLP	186 (14.26%)
4	R-L+A	34 (2.6%)
5	L-L+A	66 (5.06%)
6	B-L+A	16 (1.22%)
7	CP	47 (3.6%)
8	Ant HP	4 (0.30%)
9	Only SP	13 (0.99%)
10	Only uvula	4 (0.30%)
11	SP+U	15 (1.15%)
12	Orofacial	5 (0.38%)
13	Others	15 (1.07%)

Table 3: Number of female patients with different types of cleft (original)

Female		
Type of cleft	Number of patients	
1	RUCLP	113 (8.66%)
2	LUCLP	200 (15.33%)
3	BCLP	108 (8.28%)
4	R-L+A	44 (3.37%)
5	L-L+A	48 (3.68%)
6	B-L+A	11 (0.84%)
7	CP	56 (4.29%)
8	Ant HP	1 (0.07%)
9	Only SP	7 (0.53%)
10	Only uvula	2 (0.15%)
11	SP+U	5 (0.38%)
12	Orofacial	3 (0.23%)
13	Others	8 (0.61%)

Guangdong province of China shows the higher incidence of CLP (2.98/10,000 infants).⁷

Similarly, the study performed in Nigeria depicts 2,197 patients with cleft out of which 53.3% were male and 47% female with the greatest prevalence of LUCLP in that region which is similar to our study which depicts the highest percentage of LUCLP (30.75%).⁴ Also the study performed to analyze the prevalence of CLP in Bangladesh children showed similar results with the highest percentage of LUCLP.¹⁹

A comparative study was performed in two tertiary care hospitals in Malaysia which gives the racial-based prevalence rate of CLP and the results show the highest prevalence among Malay patients (88.6%) followed by Chinese patients (8.7%), Indians (2.5%), and others (0.2%).²⁰ While taking a view on the studies performed for analyzing the prevalence of orofacial cleft in different parts of India, the data from the state of Andhra Pradesh, India, results depicted an incidence of 1.09 for every 1,000 live births, with the highest rate of 64% cases with CLP.¹³ Also the studies for Karnataka and Kerala noted an incidence of one in 700 births with higher rates of CLP in males at 51.9% and females with 48.1%¹⁴ which is contrasting to our data reports depicting 38.18% of CLP among males and 32.27% among females (Tables 2 and 3). Again, in contrast to the results of our study, the data from a hospital-based study from Mysore Medical College gives data of 59 children with an orofacial cleft between 2011 and 2016 which showed the greatest prevalence of CLP in females (37.2%) than males (27.2%).¹⁵ Also research of a tertiary care hospital in Punjab, India, reports a profile with 59.8% male and 40.2% female patients with the highest prevalence of CLP in males.²¹ Taking into concern the data for central India, the studies show that the prevalence of CLP in the Nagpur region is 0.66% and of CP is 0.27% which again shows the higher rates of CLP in this region. The reason behind the higher occurrence of CLP in Central India is due to several environmental risk factors and lower socioeconomic status in Central India.²²

Cleft Lip

This study shows a prevalence of 16.79% of cleft lip cases which is the second highest after CLP. Similar results were obtained from the Guangdong province of China, cleft lip has the second highest (2.34/10,000 infants) prevalence after CLP.⁷ In contrast to this, a descriptive survey from Kumasi, Ghana provides sociodemographic data showing an incidence of 1.31/1,000 births with the highest occurrence of cleft lip (more in female) followed by CLP followed by isolated CP.⁹ Studies from Pakistan shows the highest prevalence of cleft lip with boys more commonly affected with cleft lip and majority of cases reported with consanguineous marriages.¹¹ A study from B P Koirala Institute of Health Sciences, Nepal, shows 398 orofacial cleft cases in which isolated cleft lip was the most prevalent followed by CLP.²³ Andhra Pradesh, India also shows similar results with 33% of patients with cleft lip.¹³ For the region of rural Gujarat, a 3-month study was performed in 2009 which gives the overall incidence of 0.73/1,000 births again a similar result with a higher occurrence of cleft anomalies seen in males was evident but the most common anomaly seen was cleft lip (69.4%) which is different from the data obtained from other parts of India.²⁴

Isolated Cleft Palate

Isolated CP is a rare form of cleft anomaly. This study performed for Wardha, Maharashtra shows a prevalence of 7.89% cases of Isolated CP.

On comparing it with other states of India it shows the lowest prevalence of isolated CP, for example, Andhra Pradesh shows only 2% of patients with isolated CP.¹³ A hospital-based survey of Mysore Medical College shows the least prevalence of isolated CP (5.1%) in males,¹⁵ whereas data from a study from a tertiary care hospital in Punjab shows a greater prevalence of isolated CP in females²¹ which is almost similar to the results of this research (Tables 2 and 3).

Other studies like the one that was performed for Taiwan, Japan showing a total of 7,278 patients reported from 1994 to 2013 showing an annual incidence of 7.28/1,000 live births that is higher compared to other countries.⁸ Similarly data was collected in the Philippines between 2005 and 2007 which included 157 subjects out of which higher male count (93) was obtained than female (64) which is similar to the data count performed in our study.¹⁰ Apart from all this, a child with orofacial cleft needs treatment from infancy which may continue to and later extend to early childhood and require a multi-sector approach for the same. Several other region-wise studies are performed which suggest that the congenital defect of the orofacial cleft is still a serious condition and there is an urgent need to spread awareness among the population and an urge for the medical fraternity to come up with advanced and better management modalities and treatment strategies. CLP is proven to be the second most common congenital defect after congenital heart defects.¹³ Among the several etiological factors, genetic etiology is still the most favored factor.¹⁴ A multidisciplinary approach is essential to reduce morbidity, manage complications of the defect, and provide lifetime maintenance for patients suffering from orofacial cleft.¹⁵

CONCLUSION

This study aims to generate knowledge regarding the demographic profile of cleft in a tertiary care hospital and teaching institute in the Wardha district of Maharashtra, India. The data reveals a greater prevalence of orofacial cleft in males (53.83%) than in females (46.17%). In addition, among all the types of clefts that are presented in this study, LUCLP has the highest prevalence for both males (15.41%) and females (15.33%). All these findings aim to raise awareness of the defect in the region.

The study presents some limitations. Since it is a retrospective study, missing data of certain patients cannot be retrieved and hence are not included in the sample collected. Moreover, the data regarding the maternal or paternal family history regarding orofacial was not evident. Also, the cleft-associated malformations take time to manifest and since the majority of patients report at an early stage of infancy, the data regarding associated malformations is missed.

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