

# Pattern of Cleft Lip and Palate According to Gender in Children of Bangladesh

Sharmin Fatema<sup>1\*</sup>  
Md Ashrafuzzaman<sup>2</sup>  
Asma Mostofa<sup>1</sup>  
Md. Ayub Ali<sup>3</sup>  
Rumela Reza<sup>2</sup>

<sup>1</sup>Department of Anatomy  
Chattagram Maa-O-Shishu Hospital Medical College  
Chattagram, Bangladesh.

<sup>2</sup>Department of Anatomy  
Chittagong Medical College  
Chattogram, Bangladesh.

<sup>3</sup>Department of Burn and Plastic Surgery  
BSMMU, Dhaka, Bangladesh.

\*Correspondence to:

**Dr. Sharmin Fatema**  
Lecturer  
Department of Anatomy  
Chattagram Maa-O-Shishu Hospital Medical College  
Chattagram, Bangladesh.  
Mobile : +88 01815 50 51 22  
Email : sfatema10@gmail.com

Date of Submission : 03.01.2023

Date of Acceptance : 12.02.2023

[www.banglajol.info/index.php/CMOSHMCJ](http://www.banglajol.info/index.php/CMOSHMCJ)

## Abstract

**Background:** Cleft defects are the most common congenital anomalies of the orofacial region. The typical distribution of cleft type is cleft lip, cleft palate and combined cleft lip and palate. To determine the frequency of Cleft Lip (CL), Cleft Palate (CP) and combined cleft lip and palate (CLP) according to gender.

**Materials and methods:** It is a cross sectional observational study with some analytical components which was carried out in the Department of Anatomy of Chittagong Medical College From April 2021 to March 2022. It was conducted among 100 children of cleft lip and palate. Data was collected from LMRF (Lions Mukhlesur Rahman Foundation) Children Hospital, Smile train (CMSOGH) cleft project and Chattogram Maa Shishu O General Hospital, Agrabad Chattogram. The data were recorded in a predesigned questionnaire. Variables were presented as percentages (%) and were compared by Chi-Square test. All statistical analysis were performed using SPSS statistics for Windows, version 26.0. Finally the results were presented using tables and figures.

**Results:** Among the 100 participants there were 58 male and 42 female children with a ratio of 1.38:1. 68% had combined cleft lip and palate, 22% had isolated cleft palate and only 10% had isolated cleft lip. Among the 10 children with cleft lip 4 were male and 6 were female. 80% of the cleft lip was on the left side. Among 22 children of cleft palate 9 were male and 13 were female. Lastly among 68 children of cleft lip and palate 45 were male and only 23 were female. 44% of cleft lip and palate was on the left side, 32% bilateral and only 24% was on the right side.

**Conclusion:** This study reported the pattern of cleft defects with gender distribution in our country which shows females are more likely to have isolated CL and CP and males have CLP predominantly.

**Key words:** Cleft Lip (CL); Cleft Palate (CP) Combined Cleft Lip and Palate (CLP).

## INTRODUCTION

Orofacial cleft is one of the most prevalent malformations of the head and neck region which occur due to improper fusion of the fronto-nasal and maxillary prominences. The incidence is approximately 1/500 to 1/1000 newborn worldwide.<sup>1,2</sup> Globally in every two minutes a cleft child is born.<sup>3</sup> The group of orofacial cleft deformity is heterogeneous. It comprises typical orofacial clefts, such as Cleft Lip (CL), Cleft Palate (CP) and combined Cleft Lip and Palate (CLP). The atypical clefts include median, transverse, oblique and other Tessier type of facial clefts.<sup>4</sup> CL generally occurs at about the sixth to seventh week of intrauterine life. It occurs due to partial or complete fusion of the maxillary prominence with the medial nasal prominence on one or both sides. In case of typical CLP the incisive foramen is considered as the landmark between the anterior and posterior deformities. Those

that lie anterior to the incisive foramen include lateral cleft lip, cleft upper jaw and cleft between the primary and secondary palates. Those that lie posterior to the incisive foramen include cleft palate and cleft uvula.<sup>5</sup> The interaction between both the genetic and environmental factors plays a role as the underlying mechanism of orofacial cleft.<sup>6</sup> There are considerable sex, ethnic and geographical variations in cleft occurrence. It is highest among Asians, Native Americans and lowest among Africans and Southern Europeans for CLP but the incidence rate for isolated CP is similar in Asian, Native Americans, Africans and Europeans.<sup>7-11</sup> The incidence is reported to be 1 in 700 among Asians and it is 9.3/10,000 in the Indian Subcontinent.<sup>12,13</sup> According to SNADF (Sayeed Nuruddin Ahmed Development foundation) Cleft Project every year 5500 - 6000 children are born with orofacial clefts in Bangladesh. Cleft lip with or without cleft palate (Approximately 1/700 births) occurs more frequently in males (65%) than in females. The frequency of isolated CP is lower than that of CL (1/1,500 births) and occurs more often in females (55%) than in males.<sup>5</sup> In Bangladesh there is no data regarding the patterns of cleft lip and palate according to gender. This study is aimed to evaluate the patterns of typical orofacial clefts according to gender.

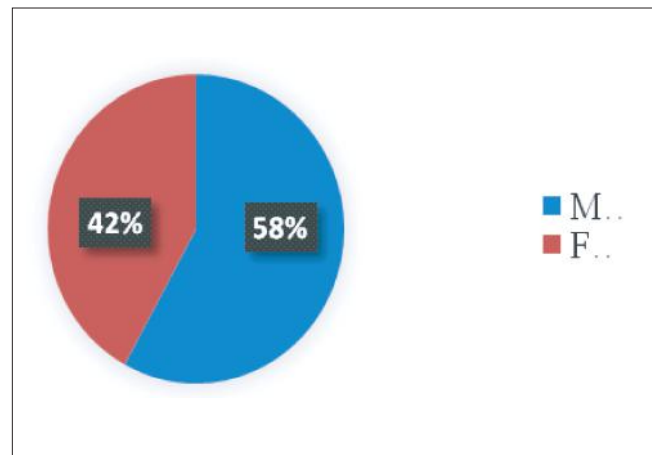
#### MATERIALS AND METHODS

This cross sectional observational study was done with 100 children with cleft lip with or without cleft palate from April 2021 to March 2022 in the Department of Anatomy, Chittagong Medical College. After getting approval from the ethical review committee of Chittagong Medical College, the study subjects were selected according to enrollment criteria. The parents of all subjects were informed and explained about the aim and objective of the study along with its procedure in detail before taking their written consent for voluntary participation in the study. A data sheet was designed to record the information such as name, age, sex of the study subjects, types of cleft defect, laterality and extension of the cleft, particulars of the parents with their present and permanent address etc. Age was recorded according to birth certificate or vaccination card of the subjects. Information about the types of the cleft lip and palate were obtained by physical examination, hospital record forms and extensive interview of the subject's parents.

#### RESULTS

A total of 100 participants fulfilling the inclusion and exclusion criteria were enrolled in the study. Results and observations are given below.

Among the participants male children were 58 (58%) and female children were 42 (42%). Male to female ratio was 1.38:1



**Figure 1** Gender distribution of the respondents

Majority of respondents (68%) had CLP (Figure 6,7,8). This was followed by isolated CP (22%) (Figure 5) and isolated CL (10%) (Figure 2,3).



**Figure 2** Child with right sided cleft lip



**Figure 3** Child with left sided cleft lip



**Figure 4** Child with incomplete cleft palate



**Figure 5** Child with Complete cleft palate



**Figure 6** Right sided both cleft lip and palate



**Figure 7** Left sided both cleft lip and palate



**Figure 8** Bilateral both cleft lip and palate

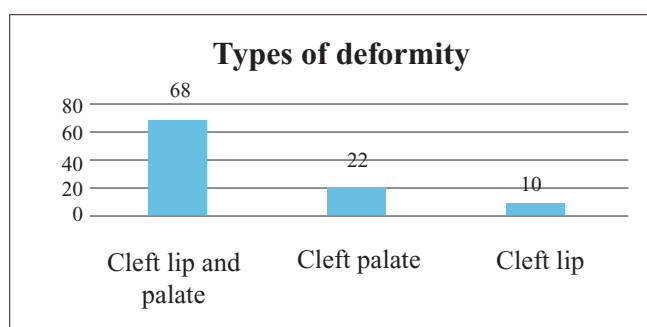


Figure 9 Types of cleft defects

Table I Evaluation of CL according to gender (n=100)

Cleft Lip	Sex		Total	p-value
	Male (%)	Female (%)		
Yes	4(40%)	6 (60%)	10	0.224
No	54 (60%)	36(40%)	90	

$p > 0.05$  = Not significant.

Table I shows among the 100 children with cleft defects 10% children had isolated CL. Among them 4 (40%) were male and 6 (60%) were female children. Chi-square test was performed and no statistically significant difference was found among gender ( $p=0.224$ ).

Among the 10 children with isolated cleft lip only 2 children (20%) had right sided cleft lip (Figure 1) and 8 children (80%) had left sided cleft lip (Figure 2)

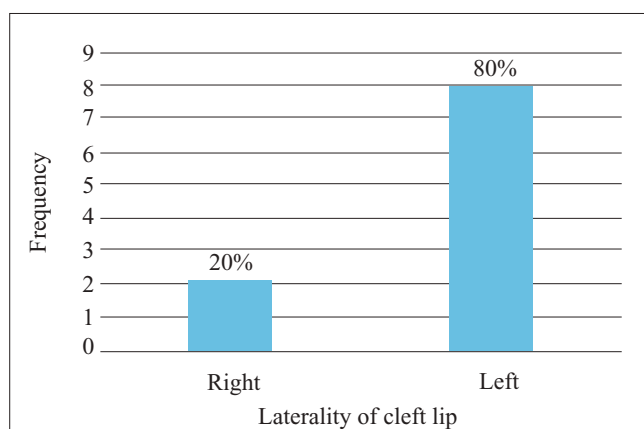


Figure 10 Laterality of isolated CL

Table II Evaluation of CP according to gender (n=100)

Cleft palate	Sex		Total	p- value
	Male	Female		
Yes	9(40.9%)	13 (59.1%)	22	0.06
No	48 (62.8%)	30 (37.2%)	78	

$p > 0.05$  = Not significant.

Table II shows among 100 children with cleft defects 22% had isolated cleft palate. Among them 9 (40.9%) were male and 13 (59.1%) were female children. Chi- square test was performed and no statistically significant difference was found among gender ( $p=0.06$ ).

Table III Evaluation of CLP according to gender (n=100)

Both cleft lip and palate	Sex		Total	p- value
	Male	Female		
Yes	45 (66.2%)	23 (33.8%)	68	0.01
No	13 (40.6%)	19 (59.4%)	32	

$p < 0.01$  = Significant.

Table III shows Among 100 children with cleft defects 68% had CLP. Among them 45 (66.2%) were male and 23 (33.8%) were female children. Chi- square test was performed and statistically significant difference was found among gender ( $p=0.01$ ).

Among 68 children with CLP 30 (44%) children had left sided defect, 22 (32%) children had bilateral defect and 16 (24 %) children had right sided defect (Figure 6,7,8).

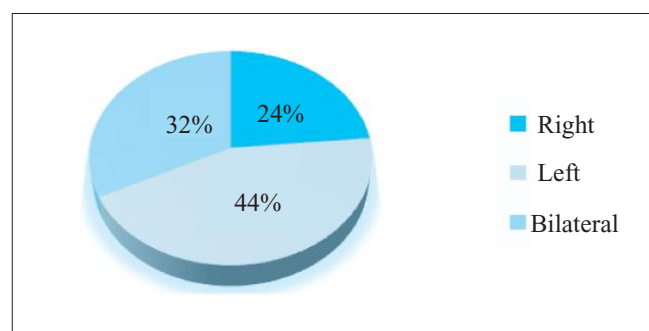


Figure 11 Laterality of CLP

## DISCUSSION

In the present study a total of 100 children were enrolled aged below 18 years with 58 (58%) male and 42 (42%) female with a male to female ratio of 1.38:1. The age of the respondents ranged from 1 months to 17 years with mean age of  $24.3 \pm 40.1$  months.

Majority of the respondents (68%) had CLP followed by isolated CP (22%) and isolated CL(10%). In a study carried out by Aljohar et al. the majority of the defects were CLP followed by CP and CL which was similar to the study.<sup>2</sup> But findings of Swami and Battepati (2018) revealed that majority of defects were CP, followed by CL and CLP.<sup>14</sup>

In the current study among 10 children with CL 4 (40%) were male and 6(60%) were female. But the gender difference was not statistically significant when the chi-square test was done ( $p=0.224$ ). Similarly in the study of Khan et al. and Bekele et al.

CL were more frequent in females than in male.<sup>1,15</sup> In contrast to the current study Impellizzeri et al. and Wilson and Hodges found more males with CL.<sup>16,17</sup>

In this study among 10 children of CL, 80% had left sided CL and 20% had right sided CL This is comparable to the studies of Swami and Battepati, Wilson and Hodges and Nagase et al. where the majority of the CL were observed on the left side.<sup>14,17,18</sup> But Bekele et al. found majority on right side.<sup>15</sup>

In the present study 22% children had CP where 9 (40%) were male and 13 (59.1%) were female. But the gender difference was not significant when test was done ( $p=0.06$ ). Similar observation was found in the study of Khan et al. Aljohar et al. Impellizzeri et al. Wilson and Hodges and Nagase et al. and where more females were affected than male with cleft palate defects.<sup>1, 2,16,17,18</sup> But Swami and Battepati and Bekele et al. found more male were affected with CP than female where Martelli et al. reported for equal involvement of male and female with CP defect.<sup>14,15,19</sup>

In the present study 68% children had CLP where 45 (66.2%) were male and 23 (33.8%) were female. The gender difference was found statistically significant when chi-square test was done ( $p=0.01$ ). Similarly, Khan et al. Aljohar et al. Swami and Battepati, Bekele et al. Impellizzeri et al. Wilson and Hodges, Nagase et al. found more male with CLP than female.<sup>1,2,14,15,16,17,18</sup> No literatures were found which disagree with the findings of the current study.

Among 68 children of CLP 30 (44%) had left sided cleft defect and 22 (32%) had bilateral defect and 16 (24%) had right sided cleft defect. Similar result was found in the study of Nagase et al. where the majority of the CLP defect was on the left side followed by bilateral and then to the right side.<sup>15</sup> Nearly similar result was found in the study of Pereira et al. where the majority of the CLP was on the left side followed by on the right side then bilateral clefts.<sup>20</sup> In contrast to the current study Bekele et al. found the majority of the CLP were bilateral followed by left sided and then right sided defect.<sup>15</sup>

All the dissimilarities may be due to the variation of the sample size, racial and ethnic variation.

#### LIMITATION

The sample size was relatively small and the sample was obtained only from Chattogram, so the present study may not truly represent the Bangladeshi population.

#### CONCLUSION

This study reported the pattern of cleft defects with gender distribution in our country. It shows that females are more likely to have CL and isolated CP. But males are significantly more likely to suffer from CLP.

#### RECOMMENDATION

A nationwide study including the tribal people of the country should be considered to make a larger sample size which will obtain more accurate data.

#### ACKNOWLEDGEMENT

All the staff of Smile train and LMRF Children Hospital for their sincere cooperation.

#### DISCLOSURE

All the authors declared no competing interest.

## REFERENCES

1. Khan M, Hidayet U, Shazia N, Tahmeed U, Hafeezullah K, Muhammad T, et al. Patterns of Cleft Lip and Cleft Palate in Northern Pakistan. *Archives of Clinical & Surgery*. 2012; 1(2): 63-71.
2. Aljohar A, Ravichandran K, Subhani S. Patterns of Cleft Lip and Palate in Hospital in Hospital-Based Population in Saudi Arabia : Retrospective Study. *Cleft Palate Craniofacial Journal*. 2008; 45(6): 592-596.
3. Sandy J, Davies A, Humphries K, Ireland T, Wren Y. Cleft lip and palate: Care, configuration, national registration and research strategies. *Journal of the World Federation of Orthodontics* 2020; 9: 540-544.
4. Tessier P, Anatomical Classification of facial, cranio-facial and latero-facial clefts. *Journal of maxillofacial surgery*. 1976; 4: 69-92.
5. Sadler TW, Langman Medical Embryology. 14th ed. Philadelphia: Wolter Kluwer. 2018.
6. Christensen K. The 20th century Danish facial cleft population-epidemiological and genetic-epidemiological studies. *The Cleft Palate-craniofacial journal*. 1999; 36(4): 96-104.
7. Aylsworth AS. Genetic considerations in clefts of the lip and palate. *Clinics in plastic surgery*. 1985; 12(4): 533-542.
8. Mossey PA and Castilla E E. Global registry and database on craniofacial anomalies: report of a WHO Registry Meeting on Craniofacial Anomalies, Geneva. WHO. 2001.
9. Butali A and Mossey PA. Epidemiology of orofacial clefts in Africa: methodological challenges in ascertainment. *Pan African Medical Journal*. 2009; 2(1).
10. Natsume N. Incidence of cleft lip and palate among Japanese newborns, 1982 to 1984. *Plast. Reconstr.Surg*.1987; 79(3): 499-501.
11. Yi NN, Yeow VK, Lee ST, Epidemiology of cleft lip and palate in Singapore-a 10 year hospital based study. *Annals of the Academy of Medicine, Singapore*. 1999; 28(5): 655-659.
12. Omo-Aghoja VW, Omo-Aghoja LO, Ugboko VI, Obuekwe ON, Saheeb BDO, Feyi-Waboso P, Onowhakpor A. Antenatal determinants of oro-facial clefts in Southern Nigeria. *African Health Sciences*. 2010; 10(1): 31.
13. Mossey PA, Little J, Munger RG. Cleft lip and palate. *Lancet*. 2009;374(9703):1773-1785. Epub. 2009.
14. Swami RS and Battipati PM. Assessment of Prevalence Pattern of OrofacialClefting and Etiological Risk Factors in Children with Cleft Lip and / or Palate. *Annals of International Medical and Dental Research*. 2018; 4(3): 24.
15. Bekele KK, Ekanem PE, Meberate B. Anatomical patterns of cleft lip and palate deformities among neonates in Mekelle, Tigary, Ethiopia, implication of environmental impact. *BMC Pediatrics*. 2019; 19(1): 1-7.
16. Impellizzeri A, Giannantoni I, Polimeni A, Barbato E, Galluccio G. Epidemiological characteristic of Orofacial clefts and its associated congenital anomalies: Retrospective study. *BMC Oral Health*. 2019; 19(1): 1-4.
17. Wilson J and Hodges A. Cleft lip and palate surgery carried out by one team in Uganda: where have all the palates gone? *The cleft palate-craniofacial journal*. 2012; 49(3): 299-304.
18. Nagase Y, Natsume N, Kato T, Hayakawa T. Epidemiological analysis of cleft lip and/or palate by cleft pattern. *Journal of maxillofacial and oral surgery*. 2010; 9(4): 389-395.
19. Martelli-Junior H, Porto LV, Martelli DRB, Bonan PRF, Freitas AB, Coletta RD. Prevalence of nonsyndromic oral clefts in a reference hospital in the state of Minas Gerais, Brazil, between 2000-2005. *Brazilian oral research*. 2007; 21: 314-317.
20. Pereira AV, Fradinho N, Carmo S, de Sousa JM, Rasterio D, Duarte R et al. Associated Malformations in Children with Orofacial Clefts in Portugal: A 31 year study. *International Open Access Journal of the American Society of Plastic Surgeons*. 2018; 6(2): 1-7.