

## Frequency of Cleft Lip and Palate in Orthodontic Patients Reporting to Armed Forces Institute of Dentistry, PAKISTAN.

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### Abstract

**Aim:** Cleft lip and palate is a social and functionally crippling problem. It is necessary to assess the degree of this problem in our society.

The goal of this study was to assess the number of cleft lip and palate patients in orthodontic patients reporting to Armed Forces Institute of Dentistry (AFID), Rawalpindi, from 2001 through 2006.

**Materials and Methods:** 1118 consecutive patients reporting to AFID were included in the study. 18 were excluded based on inadequate records. Records were evaluated for the presence of clefts, impacted and missing teeth.

**Results:** 1% patients were found to have various kinds of clefts. 72.7% were female and the rest were male. Their mean age was 16.5 years. Bilateral clefts were more common. Reverse overjet and missing maxillary lateral incisors were strongly associated with cleft lip and palate.

**Conclusion:** Cleft lip and palate is reasonably prevalent in our society. Genetic predisposition and environmental factors are equally important in governing its occurrence. Both these issues have to be considered to reduce the incidence of this problem in a developing country such as ours (IJO 2006;1:154-7).

**Key Words:** Cleft lip, Cleft palate, Prevalence, Pakistan.

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Orofacial clefting, including cleft lip with or without cleft palate is the most common dentofacial anomaly.<sup>1</sup> Patients with such deformities not only suffer esthetically but functionally as well. Feeding, deglutition, speech and even hearing disabilities are a few of the problems that cleft lip and palate patients suffer from.<sup>2</sup>

The group of orofacial cleft anomalies is heterogeneous. It comprises of typical orofacial clefts, such as CL, CLP, and CP, and atypical clefts, including median, transversal, oblique, and other Tessier types of facial clefts.<sup>3,4</sup> About half of all clefts involve both the lip and palate. About 2 in 10 are of the lip alone and 3 in 10 are of the palate alone. Of clefts that involve the lip, 8 in 10 are unilateral and 2 in 10 are bilateral.<sup>5</sup>

The etiology of clefts in the orofacial region is difficult to pinpoint because of the complex interaction of both genetic and environmental factors. The proportion of environmental and genetic factors varies with the sex of the individual affected with cleft. In CL and CLP, it also varies with the severity and the unilaterality or bilaterality of the cleft anomaly, with the highest proportion of genetic factors being in the subgroup of females with a bilateral cleft and the

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smallest in the subgroup of males with a unilateral cleft. Thus, the classic multifactorial threshold (MFT) model of liability can be applied to CL/P as the multifactorial model of liability with 4 different thresholds. This model can help to better understand differences in values of risk of recurrence as well as differences in prevention approaches between different subgroups of clefts.<sup>6</sup>

Some of the environmental factors governing clefts are old maternal age at the time of conception, lack of prenatal care, maternal malnutrition, smoking during pregnancy or any other condition that may cause hypoxic changes during the early formative stages. Certain drugs and substance abuse have been blamed for clefts repeatedly. Recent studies show that folic acid intake during pregnancy can reduce the occurrence of this problem. A daily dietary intake of 0.4mg of folic acid is recommended.<sup>7</sup>

More recently genetic predisposition in relation to development of clefts has been emphasized on. Non-syndromic clefting and genetic relations are seen for instance, in trisomy 9 mosaic. This does not however shift the paradigm of clefts being a congenital disorder to a purely genetic one as multiple environmental factors still exacerbate the development of clefts.<sup>8</sup>

Considering the environmental factors involved we can expect to see a comparable prevalence to other groups in our country owing to a higher degree of maternal malnutrition.

## MATERIALS AND METHODS

This study was conducted in Armed Forces institute of Dentistry, Rawalpindi Pakistan to assess the frequency of cleft lip and palate patients presenting to us. 1118 consecutive patients were included in the study. The inclusion criterion was presence of any form of orofacial cleft whether associated with a syndrome or not. A complete set of clinical records was considered mandatory for inclusion into the study group. Since this was a retrospective cross-sectional study patients with incomplete dental records were excluded. Intra and extra oral photographs, radiographs and clinical notes based on previous

examination were screened for cleft lip and palate patients.

Gender and age distribution was observed. Location of clefts was noted as was the presence of impactions or missing teeth.

## RESULTS

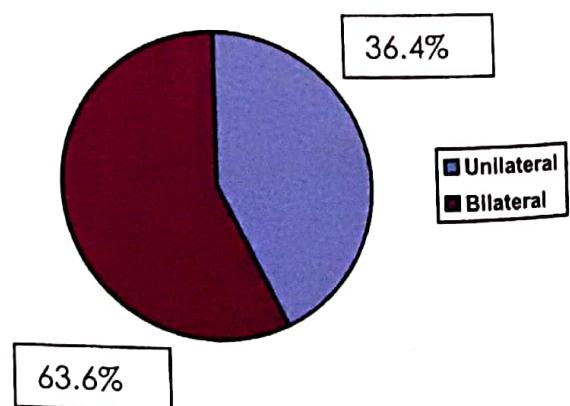
1118 patients were screened for the presence of cleft lip and/or palate. 18 patients out of the total did not fit the inclusion criteria and were excluded from the total sample because of inadequate records.

Of the remaining 1100 patients 11(n) ie. 1% of our orthodontic patients were affected by cleft lip and/or palate. 72.7% of the affected were females and the rest 27.2% were males. Table(1) The mean age of the patients presenting with clefts was 16.5 years.

**Table 1. Gender distribution.**

Males (n)	Females (n)
27.2% (3)	72.7% (8)

90.9% of patients had combined clefts of the lip and palate whereas only 9.09% had isolated cleft of the lip only. Of the cleft lip and palate patients 63.6% patients had bilateral clefts and the rest 36.4%, had a unilateral cleft. Figure1.



**Figure 1: Unilateral and Bilateral clefts**

Several associations were also observed, for instance the presence of impactions which were found in about 54.54% (6) of the patients. Missing teeth whether single or multiple were



observed in 72.72% (8) patients. 54.5% patients had missing lateral incisors and 27.72% had missing first molars.

Reverse overjet was observed in 72.72% of the cleft patients.

## DISCUSSION

A relatively high prevalence of cleft lip and palate patients was observed in our study. This is attributed to the fact that an orthodontic sample was screened rather than a general or pediatric population.

We found a prevalence of 1% in our study whereas the generally accepted prevalence is 1 in 700 live births irrespective of race.<sup>9</sup> The overall prevalence rate for live births with cleft lip, cleft palate, or both was 1.39 per 1000 live births. Thirty percent of the clefts identified affected the lip, 22 percent affected the palate, and 48 percent involved the clefts of the lip and palate.<sup>10,11</sup>

Owing to the differential prevalence of various types of clefts in different races, ethnic influences cannot be ignored. Native Americans and Asians seem to be affected more than any other race, Africans have the lowest prevalence rates of cleft lip with or without cleft palate. 3.74 out of 1000 of native Americans are affected by cleft lip with or without cleft palate. 0.82 in 1000 of Japanese, 3.36 in 1000 of Chinese, and 1.45-4.04 in 1000 of Caucasians are affected.<sup>12</sup>

Cleft lip and palate are often associated with other craniofacial or genetic abnormalities. It is estimated that 3-65% of patients with orofacial clefts suffer from other anomalies.<sup>13</sup> Jones<sup>14</sup> recognized a greater association between cleft palate only and syndromes rather than cleft lip and palate. According to his studies 14.3% patients with cleft lip and palate had other congenital disorders compared to 54.7% of cleft palate only patients suffering from other anomalies.

Mechanical obstruction may render some teeth impacted and loss of epithelial cells early on may account for total agenesis of teeth<sup>13</sup>. On our study we found that the tooth most commonly missing was the maxillary lateral incisor. Although the percentage of missing laterals was high it was undetermined in some patients whether their teeth were extracted owing to mobility or were missing congenitally.

A detailed history could not be generated from some patients. As far as impactions are concerned, maxillary canines were impacted most frequently. Their impaction can be attributed to the natural mechanical abnormality and to the absence of lateral incisors as there is a strong association between impaction of canines and delayed or non eruption of maxillary lateral incisors.<sup>15</sup>

Reverse over-jet was also found in most patients. All of them had their clefts repaired at a very early age. Scar tissue is considered to be the cause of this growth restraint.

## CONCLUSION

A significant frequency of cleft lip and palate patients was found in our orthodontic sample. Owing to the interest in genetic etiological factors and an unusually high percentage of consanguineous marriages in Pakistan, premarital genetic counseling should be sought on a routine basis.

Adequate education of women of childbearing age regarding nutrition and possible teratogens can further reduce the risk of this condition in our country

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