

# Growth and Development of Cleft Lip and Cleft Palate Children Before and After Reconstruction Surgery

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## **Research Article**

**Abstract:** Birth of baby brings happiness in the lives of parents and family .But what could be more tortuous for parents to see their baby with the deformity of cleft lip and palate .Along with cosmetic defect, the deformity puts enormous psychological, emotional and financial burden to parents .The anatomical defects suffered by children with cleft lip and cleft palate are known causes of early difficulties with feeding which can lead to under nutrition and compromised growth. The basic reason behind choosing this topic is lack of such studies in India.

**Keywords:** Cleft Lip, Cleft Palate, oro-facial.

### **Introduction:**

It is well documented that in the early months after birth, children with clefts fail to achieve satisfactory growth (1). However, it is not clear whether growth pattern returns to normal after surgery .In this study we explored the relative influence of cleft type and the experience of early feeding problems on weight and height gain before and after corrective surgery. Kids with a cleft lip or palate tend to be more susceptible to middle ear fluid collection, hearing loss and speech defects .Dental problems such as missing, extra, malformed or displaced teeth and cavities also are common in kids born with cleft palate. Many children with clefts are especially vulnerable to ear infections because their Eustachian tubes don't drain fluid properly from the middle ear into the throat. Fluid accumulates, pressure builds in the ears and infection may set in. Feeding can be another problem for an infant with a cleft lip or palate .A cleft lip can be make it more difficult for a child to suck on a nipple ,while a cleft palate may cause formula or breast milk to be accidentally taken up into the nasal cavity. The recurrent infections, syndromic associations, feeding difficulties may lead to malnutrition in these children.

### **Material and Method:**

This study includes 50 children admitted consecutively with oral clefts , referred for reconstruction to Plastic Surgery Department, K.G.P. Children Hospital, Baroda, a tertiary care hospital , a tertiary care hospital under Smile Train Programme during period of one year (June 2007 to June 2008).It is a prospective cohort study.The total group of oro-facial clefts comprised 32 males and 18 females before operation. The study group includes children less than one year .The patients comprised two groups, isolated cleft palate and isolated cleft lip.30 had cleft lip and 20 had cleft palate. The children with combined cleft lip and palate, children with associated malformation, syndromic children were excluded from this study. Inner controls were used for comparison of variables.

The data gathered at the time of operation from parents includes age, sex, type of cleft, address, feeding problems present or not. Anthropometry of child was noted. Weight was measured by electronic scale. Length was measured by infantometer and head circumference by measuring tape. Weight for age and height for age were calculated by using IAP growth charts (2). Then children were classified for weight for age as Normal - >80% , Grade 1-71-80% , Grade 2-61-70% , Grade 3-51-60% ,Grade 4- <50% and height for age as Normal- >95% , Grade 1-90-95% , Grade 2-85-90% , Grade 3- <85%. Then children were followed up after 3 months and 6 months after operation and similar data was collected again. Weight for age was then compared in lip and palate group. Similarly height for age was also compared. Chi-square test was used for analysis. The results of study were compared with An epidemiological study of oral clefts in Iran: analysis

of 1669 cases, which was a 15- year cross sectional study from 1976 to September 1991 (3).

**Results:**

**Sample profile on admission**

**Total number of patients N=50**

**Table no.1**

Variable	N	% of N
<b>Gender</b>		
Male	32	64%
Female	18	36%
<b>Type of cleft</b>		
Cleft lip	30	60%
Cleft palate	20	40%
<b>Weight for age</b>		
Normal	12	24%
Grade 1	20	40%
Grade 2	13	26%
Grade 3	5	10%
<b>Height for age</b>		
Normal	27	54%
Grade 1	21	42%
Grade 2	2	4%

**Comment:** This study includes total 50 patients less than one year of age. There was a high male preponderance. Male : female ratio was 1:0.56 as compared to national male to female ratio 1:0.918 for 0-6 year(5).Group comprised of 60% cleft lip patients and 40% cleft palate patients. In anthropometry measurements, weight for age, 40% children fall in Grade-1 malnutrition, 26% in Grade-2 malnutrition, 24% in Normal variety and 10% in Grade-3 malnutrition. Thus weight is affected in cleft patients. In height for age category, 54% children were in Normal variety, 42% in Grade-1 and 4% in Grade -2.

**Table no 2: Patients on follow up**

	On Admission (before operation)	After 3 months of surgery (1 <sup>st</sup> follow-up)	After 6 months of surgery (2 <sup>nd</sup> follow-up)
Number of Patients	50	45(90%of admission)	35 (70%of admission)

**Comment:** The total number of patients reduced to 90% of before surgery after 3 months with first follow up, on second follow up six months after operation reduced to 70%.

**Table no 3: Comparison of type of cleft**

Type of cleft	Present Study(N=50)	Iranian Study(N=1669)
Cleft lip	30(60%)	543(34%)
Cleft palate	20(40%)	281(16.83%)

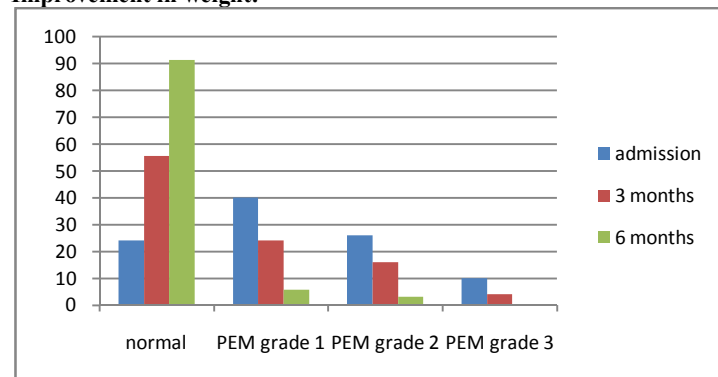
**Comment:** In previous study combined lip and palate group was predominant and second common was lip and in our study we excluded combined group and commonest group is lip.

**Table no 4: Weight for age**

	Normal	Grade 1	Grade 2	Grade 2
On admission	12(40%)	20(40%)	13(26%)	5(10%)
3 months	24(55.6%)	12(24.4%)	6(15.6%)	3(4.4%)
6 months	32(91.4%)	2(5.7%)	19(2.9%)	0

**Comment:** Weight for age improved gradually after surgery. Before operation the children in normal weight age category were 24% and they increased to 91% after six months of operation.

**Improvement in weight:**



**Chi-square test for Weight measurements**

	Value	degree of freedom	P value
Pearson Chi-square tests:	38.052	6	0.000

**Comment:** P value is significant so weight gain is significant after surgery.

**Table no 5: Weight for age**

	Normal	Grade 1	Grade 2	Grade 3
On admission	12(40%)	14(46.7%)	3(10%)	1(3.3%)
3 months	20(80%)	3(12%)	2(8%)	0
6 months	18(100%)	0	0	0

**Cleft palate**

	Normal	Grade 1	Grade 2	Grade 3
On admission	0	6(30%)	10(50%)	4(20%)
3 months	5(25%)	8(40%)	5(25%)	2(10%)
6 months	14(82.4%)	2(11.8%)	1(5.9%)	0

**Comment:** In cleft lip children, normal group comprised 40% while in palate group 0% children were in normal weight for age group. This shows that malnutrition is more in palate group.

**Chi-square test:**

	Calculated value	Degree of freedom	P value
Pearson chi-square in lip group	22.398	6	0.001
Pearson chi-square in palate group	31.964	6	0.000

**Comment:** P value is significant both in palate and lip group so weight gain is significant in both groups after surgery.

**Table no 6: Height for age**

	Normal	Grade 1	Grade 2
On admission	27(54%)	21(42%)	2(4%)
3 months	33(73%)	11(24.4%)	1(2.9%)
6 months	34(97.1%)	1(2.9%)	0

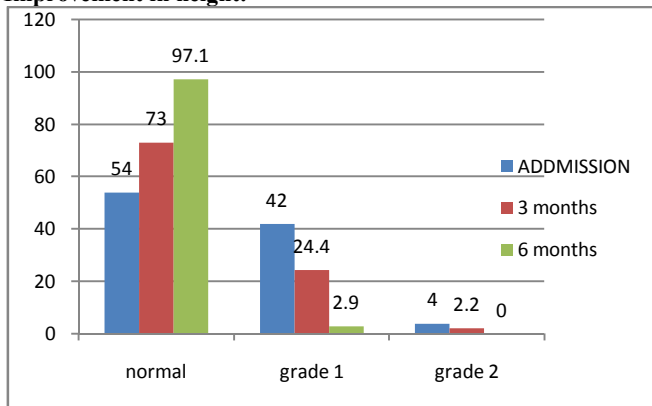
**Comment:** Height for age in cleft children- 54% were in normal group, 42% in Grade-1 and 4% children in Grade-2. After operation, at 3 months, normal group comprised 73% , 24.4% in Grade-1 and 2.95 in Grade-2. After 6 months, about 97% patients were in normal category.

**Chi-square test:**

	Calculated value	Degree of freedom	P value
Pearson chi-square	19.190	4	0.001

**Comment:** P value was significant so height improvement noticed after surgery in both cleft lip and palate group is significant.

**Improvement in height:**



**Table no.7: Height for age**

**Cleft lip**

	Normal	Grade 1	Grade 2
On admission	24(80%)	6(20%)	18(100%)
3 Months	22(88%)	3(12%)	0
6 months	18(100%)	0	0

**Cleft palate**

	Normal	Grade1	Grade 2
On admission	3(15%)	15(75%)	2(10%)
3 months	11(55%)	8(40%)	1(5%)
6 months	16(94.1%)	1(5.9%)	0

**Comment:** In lip group, 80% children were in normal range while in palate group only 15% in normal range so we can conclude that height is more affected in palate group.

**Chi –square test:**

	Calculated value	Degree of freedom	P Value
Pearson chi - square in lip group	4.167	2	0.124
Pearson chi –square in palate group	23.170	4	0.000

**Comment:** P value is not significant in lip group that means height was not significantly affected, while in palate group P value is significant so height improvement was significant.

**Discussion:**

The study was undertaken with objectives of to study growth and psychosocial and motor development of cleft lip and cleft palate children before and after reconstruction surgery. The basic reason behind this study is lack of such studies in India .The study was done at K.G.P. Children Hospital , Vadodara, a tertiary care centre running smile train programme. It is a prospective cohort study . It includes 50 children less than one year of age and had cleft lip or cleft palate but combined palate and lip , syndromic babies excluded from study .Out of 50 children, 30 were cleft lip and 20 were cleft palate. On admission, weight ,height and head circumference were measured .Using IAP growth charts, weight for age ,height for age were calculated and grading malnutrition was done.

Cleft children especially cleft palate have feeding problems like regurgitation of feeding , recurrent infections which leads to failure to thrive in these children .Children were followed up after 3 and 6 months of reconstruction surgery and similar data regarding height ,weight , head circumference and development were noted.

**Observations:**

The children included in this study comprises 64% male and 36% female.Thus male predominance was observed in study.This may be due to male predominance in cleft as WHO report .This study reveals that all children with clefts have a tendency to growth faltering.Height and weight for age both get affected due to cleft deformity.

The isolated palate group has more compromised growth than lip as shown in this study and previous studies .All cleft types showed catch up after surgery to centile positions close to those predicted for normal children, a finding that has been described in a previous study also (8).

It is not hard to explain the growth faltering seen, since a large proportion of the children in the study population experienced early feeding difficulties which were often prolonged and multiple. It would seem desirable that appropriate and timely dietary advice be given , possibly by involving a dietician in the interdisciplinary surgical team. Certainly the height and weight of cleft palate children should be routinely recorded when they attend the outpatient clinic to allow for prompt identification of a growth deficit, so that appropriate action can be taken (9). The presence of a syndrome did appear to be

important in predicting height achievement, an observation that has been made previously (7). But in this study we have excluded syndromic babies and combined palate and lip group.

In this study we compared results with Iranian study(3). Iranian study was epidemiological study of oral clefts , analysis of 1669 cases. The study was done at Shiraz , Iran.The study was 15 year cross sectional (prevalence) study from 1976 to 1991.While comparing the gender distribution, a fact revealed that males dominated in both studies with 64% in present study and 57.2% in Iranian study. The male : female ratio was found to be 1:0.560 and 1:0.746 in present and Iranian study respectively. The results probably are a strong indication that males are affected more in orofacial clefts as is also indicated by WHO reports.

The combined lip and palate group predominated 50.62% in Iranian study and second commonest was lip group while in our study we excluded combined group and lip group predominated.

After 3 months, sample size reduced to 45 and after 6 months only 35 children came for follow-up .The reasons behind drop of number of patients for follow-up may be female sex, illiteracy ,low family income ,and distance from hospital .The weight for age after 6 months for normal variety increased from 24% before operation to 91% after operation .The height for age measurements in normal variety increased from 54% to 97% after 6 months.Thus height and weight both recovered after operation.

### Conclusion:

Weight and height faltering is commonly seen in children with cleft but this is of a short-term nature. Following reparative surgery, catch-up is shown by children with all cleft types and there is no lasting effect on either weight or attained height. Although the weight faltering is a temporary phenomenon, it is likely to cause great anxiety to parents, who might benefit from a more proactive attempt to offer dietary advice and support in the early weeks of their child's life.

### Suggestions for Future Work:

1. Looking at the paucity of Indian data with regards to oro-facial clefts, we need to have more population based studies to ascertain the true incidence and prevalence of oro-facial clefts since accurate data on epidemiology is important for documenting

the burden in relation to planning of public health service.

2. In future, all groups of cleft palate and or lip can be studied also including syndromic babies so as to decide whether syndromes really affect the growth of these babies or not.
3. Since the quality of life of children with clefts is affected considerably, there is need for public awareness regarding the availability of surgical treatment and early intervention.
4. Study containing large sample size is advisable for future and speech should also be studied well before and after surgery.

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