

## SPEECH RESULTS IN POST OPERATIVE CASES OF CLEFT PALATE AFTER SPEECH THERAPY

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In this study, speech in cases of cleft palate before and after speech therapy have been studied. A total of 22 cases were considered for inclusion in this study. Those who had cleft involving the soft palate or soft palate and the hard palate with or without cleft of lip and had undergone a surgical repair of the cleft palate in the Department of Plastic Surgery, K.G.'s Medical College, Lucknow, were selected. Only such patients whose surgical closure of the palate was complete and who had speech defects including articulation defects and/or excessive nasality, and who could attend speech training programme for a period ranging from 3 weeks to 6 weeks, were considered.

Of the 22 cases considered 19 fulfilled the above conditions.

### Method of study

These subjects were asked to read a list of 100 words and 15 sentences. The list covered all the speech sounds of Hindi in all positions of occurrence. The speech of each subject was tape recorded. Cases who were unable to read were asked to repeat the words and sentences after the clinician. The recorded speech was later transcribed phonetically for analysis of speech defects.

Information regarding the type of cleft in them were collected from the hospital case records. The appearance, function and diadochokinetic rate of the organs of speech were also recorded. They were then subjected to speech therapy.

### Treatment

The treatment was based on the following principles:

(i) Repetition of the correct sounds and reinforcement of the correct responses.

(ii) Control of the rate of speech. This is based on the finding that improvement in articulation is noticed in cleft plate speakers when speaking rate is reduced (Hess, 1971). From the findings by Lass and Noll (1970), Tarlow and Saxman (1970), and Hess (1971), we might infer that cleft palate speakers generally sense a need to speak more slowly to achieve more proficient articulation, greater intelligibility, and possibly even improved voice quality.

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(iii) Control of oral air flow. Emmanuel and Counihan (1970) have found that the air flow for voiceless plosives always exceeds those for their voiced cognates ; and the oral airflow is more while producing a low vowel than a high vowel.

(iv) Movement, manipulation and massage of the soft palate helps in better control of the oral escape of air, thereby reducing nasality. This is based on the findings of Mennel (1947) Lubit and Harrison (1969) made use of this principle in the construction of the LPE. Lubit and Larsen (1971) have demonstrated that the manipulation, movement and exercise of the palate by the LPE brings forth the improved neuromuscular activity, increased forward movement of the posterior pharyngeal wall and mesial movement of the lateral pharyngeal walls and an increased length and thickness of the soft palate. This effects better velopharyngeal closure and consequent reduction in the nasality of cleft palate speakers.

In the treatment of the subjects specific attention was given in getting the case to achieve better oral breath pressure control and they were made to articulate more slowly during speech. The cases were asked to build up more breath pressure while producing voiceless stops and fricatives than while producing voiced plosives.

The palate was manipulated by introducing a padded strut into the mouth and pushing the soft palate as high and back as possible, without producing a gag, while the case was phonating the vowel /e/. In the case of nasality the cases were asked to continue this exercise at home as many times as possible.

In articulation correction the phonetic placement method was employed mostly. The cases were instructed as to how to place and move the various articulators for the production of a particular sound correctly. When the case succeeded in producing the sound correctly, he was made to repeat the sound correctly. During the repetition of the sound the cases were encouraged verbally by the clinician thereby reinforcing the correct responses. The cases were made to articulate the sound in monosyllabic, disyllabic and multisyllabic words and sentences in that order. Correction of one sound was attempted at a time. The easier sound was corrected before attempting to correct a more difficult sound.

At the end of the speech therapy programme the cases were made to read, or repeat after the clinician, the previously used list of words and sentences. The speech was recorded and it was transcribed phonetically, for a comparison between the original speech and the speech after the speech correction.

## Results

Age distribution of cases with types of cleft is given in table 1. In table 2 speech mechanism examination findings are presented. Pre and post speech therapy results are given in table 3. The test findings of articulation are presented in terms of percentage error. A comparison between the percentage errors in the pre and post speech therapy conditions shows the effect of speech therapy.

TABLE 1. Age distribution of cases with type of clefts

| Group              | number of cases | Type of Cleft        |                                      |  |   |
|--------------------|-----------------|----------------------|--------------------------------------|--|---|
|                    |                 | cleft of soft palate | cleft of soft palate and hard palate | unilateral cleft of soft and hard palate and lip | bilateral cleft of soft and hard palate and lip |
| below 5 years      | 3               |                      |                                      | 1  | 2   |
| 5 yrs. to 10 yrs   | 5               | 2                    |                                      | 2  | 1   |
| 10 yrs. to 15 yrs. | 6               | 1                    | 2                                    | 1  | 2   |
| 15 yrs. to 20 yrs. | 4               | 1                    |                                      | 2  | 1   |
| above 20 yrs.      | 1               |                      |                                      | 1  |   |

TABLE 2. Speech mechanism examination findings

|                      | Below 5 yrs. | 5 to 10 yrs. | 10 to 15 yrs. | 15 to 20 yrs. | above 20 yrs | cleft of soft palate | cleft of soft and hard palate | cleft of soft and hard palate and lip uni-lateral | cleft of soft and hard palate and lip bi-lateral |
|----------------------|--------------|--------------|---------------|---------------|--------------|----------------------|-------------------------------|---|--|
| malocclusion         |              |              |               |               |              |                      |                               |   |  |
| overbite             | ...          | 1            |               |               |              |                      |                               | ...   | 1  |
| underbite            | 1            |              | 1             |               | 1            | 1                    | ...                           | 1   | 1  |
| missing teeth        | 2            | 1            | 1             | 2             | 2            | 1                    | 2                             | 1   | 1  |
| irregular teeth      | 1            | 2            | 1             | 1             | ...          | 1                    | 2                             | 1   | ...  |
| edentulous space     |              | 1            |               |               | 1            | ...                  | ...                           | 1   |  |
| jumbling teeth       |              | 1            | 2..           | 1             | ...          | 1                    | 1                             | 1   | ...1   |
| irregular lip        | 1            | 2            | 2             | 1             | 1            | 1                    | 2                             | 2   | 1  |
| narrow hard palate   | 1            | ...          | 1             |               |              |                      |                               | 1   | 1  |
| diadochokinetic rate |              |              |               |               |              |                      |                               |   |  |
| normal               | ...          | 2            | 3             | 2             | 1            | 2                    | 3                             | 2   | 1  |
| slow                 | 2            | 3            | 3             |               | ...          | 2                    | 3                             | 4   | 1  |
| very slow            | 1            |              |               |               |              |                      |                               | ...   | 1  |
| short soft palate    | 1            | 1            | 2             | 1             | ...          | 1                    | 2                             | 1   | 1  |

TABLE 3. Pre and post speech therapy measures of articulation expressed in percentage error

| articulation measurement    | pre speech therapy percentage error | post speech therapy percentage error |
|-----------------------------|-------------------------------------|--------------------------------------|
| Total consonant error       | 28                                  | 10                                   |
| <b>position</b>             |                                     |                                      |
| initial                     | 32                                  | 14                                   |
| medial                      | 24                                  | 9                                    |
| final                       | 25                                  | 9                                    |
| <b>stops</b>                | 24                                  | 10                                   |
| voiceless                   | 26                                  | 11                                   |
| voiced                      | 18                                  | 9                                    |
| fricative                   | 22                                  | 9                                    |
| trill                       | 4                                   | 1                                    |
| lateral                     | 2                                   | 0                                    |
| nasalization                | 21                                  | 11                                   |
| <b>incidence error type</b> |                                     |                                      |
| omission                    | 9                                   | 2                                    |
| substitution                | 11                                  | 5                                    |
| distortion                  | 6                                   | 3                                    |
| addition                    | 2                                   | 1                                    |

## Discussion

Speech is **recognized** as the essential **criterion** for assessing the ultimate results of treatment in the speech correction programme of cleft palate speech defects.

In cleft palate speech acoustically three types of speech distortion are possible: (a) hyper nasality because sound is not neatly and alternately separated into oral and nasal routes of emission by the precise palatal valving, (b) speech distortion due to loss of acoustic energy to nasal cavity, whereby sounds that require maximum oral pressure (e.g., stops and fricatives) are affected, and (c) speech distortion due to the reshaping of the acoustic spectrum. This brings certain recessive frequency bands into prominence thereby affecting the intelligibility of speech (Fletcher 1970). Attention to improve the efficiency of the velopharyngeal mechanism results in the overall improvement in the speech characteristics of the individual. This combined with the activities for the precise movements for the production of speech sounds brings forth a remarkable improvement in speech in the case of cleft palate speech defect.

## Summary

Effect of speech therapy on post operative cases of cleft palate has been studied. Methods and rationale of treatment have been discussed.

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