6.0. INTRODUCTION

The present study on the Bengali dysarthric speech is the first of its kind. In other words, Bengali dysarthric speech has not so far been dealt with from the linguistic angle. The study was conducted on 128 Bengali dysarthric patients and the perceptual analysis of their speech was done using the Articulatory test material (see Section 5.2). Spectrographic analysis of the words consisting of the imprecise consonants was done (see Section 5.5). The acoustic analysis of the sustained phonation /a/ was also done using the Multi-Dimensional Voice Program software.

The second chapter deals with the nature and types of dysarthria. In the third chapter it has been pointed out how linguistic methodology is very much required for the study of the dysarthric speech. For the benefit of assessing the exact nature of disorder in Bengali dysarthric speech at the level of phonology, a description of the skeletal structure of the
Bengali phonology has been presented in the fourth chapter. The fifth chapter provides the analysis of the six types of Bengali dysarthric speech, viz, spastic, flaccid, hypokinetic, hyperkinetic, ataxic and mixed. It was observed that dysarthria is chiefly the disorder at the level of speech production and affects the articulation of consonants and vowels. The extent of difficulty of the dysarthric patients at the level of speech production varies greatly depending on the extent of neurological damage. That means, in Spastic, Flaccid, Hypokinetic, Hyperkinetic, Ataxic and Mixed dysarthria the domains of respiration, phonation, articulation, resonance and prosody are affected to a greater and lesser degree depending on the severity of the lesion.

The relevance of the present study in the context of the dysarthric Bengali speech has been highlighted in the following sections.

6.1. UTILITY OF THE STUDY

As already mentioned the present work offers the study of the dysarthric speech from the linguistic point of view relating to the various parameters of the domains namely, respiration, phonation, articulation, resonance and prosody so far as the Bengali language is concerned as the phonological as well as the prosodic structures are language
dependent phenomena. Further, the speech sounds distorted during the time of production, once identified, will help to trace whether at the phonological level of the language any patterned changes have occurred or not (see Section 5.3).

From the societal point of view also the study has its own importance. There is a lack of awareness among the individuals suffering from dysarthria and also among their family members. They ignore the fact that the right to speak is a fundamental right of every individual and they should utilize this amazing power with clarity and effectiveness. Most of the dysarthric individuals shy away from the society out of the fear of talking. Whenever they fail to establish a proper communication with the peer group they prefer to stay mute. On the other hand, the society either appears nonchalant about the problem or scoffs at the inability of the dysarthric individuals. However, it has to be kept in mind that social isolation is not the remedy. Rather, identification and evaluation of the problem will generate awareness among the individuals and the community and thus will inspire them to seek for remedial measures.

From the point of view of speech therapy too the identification of distorted speech sounds can prove to be beneficial. It will help in systematizing the routine of therapy. The various phonetic drills will help
in the rectification of the distorted sounds. The identification of the problems at the level of respiration and phonation too will help in the speedy cure of the patients.

6.2. INTERVENTION METHODS

In dysarthria the treatment and the administration of the drills for the patients suffering from dysarthria depend to a great extent on its severity.

Patients with severe form of dysarthria may have to learn to use alternative forms of communication, like using message cards or alphabet boards whereby they can spell out the words that they intend to express.

In this connection, Dworkin (1991:188) recommends the following treatments for severe dysarthrias. They are as follows:

1. Lingual, labial, and mandibular musculature tone reduction (relaxation techniques).
2. Lingual, labial, and mandibular musculature strengthening (exercises).
3. Lingual, labial, and mandibular force physiology training (isometric).

4. Phonetic stimulation in various contexts.

Dworkin further states that as abnormality in the control of the articulators can be seen in all types of dysarthria, so strengthening exercises are needed.

For mild or moderate form of dysarthria different strategies can be taught to make their speech more intelligible. According to Rosenbeck and LaPointe (1985), the goal of therapy for dysarthria is to help patients achieve compensated intelligibility. As dysarthria can impair respiration, phonation, articulation, resonance and prosody, so, therapy should include drills, which will address these aspects of speech production.

Yorkston et al (1987: 297) defined articulation as 'the movement of speech structures employed in producing the sounds of speech.' So 'the movements of the tongue, lips, and jaw that shape the oral resonance cavity during production of vowels and the movements that constrict or obstruct the voiced or voiceless airstream during consonant production' need to be precise for the production of intelligible speech that consists
of the combination of consonants and vowels. Further, it has to be kept in mind that

'the perceptual distinction between voiced and voiceless cognate pairs is based on the precise laryngeal timing as well as subtle adjustments in the duration of oral articulatory gestures. Voiced versus voiceless distinctions are often difficult for a dysarthric speaker to achieve, perhaps because of the complex timing and coordination required between a number of speech components. Imprecise production of speech sounds is not simply an oral articulatory phenomenon, but is the result of laryngeal, velopharyngeal, and oral articulatory impairments.'

Hence, the compensatory strategies for achieving intelligible speech should cover all the motor processes of respiration, phonation, articulation, resonance and prosody as there is 'interdependence of the oral articulators and other speech components' (Yorkston et al, 1987:297).

In connection with the intervention methods which seem to be more relevant for the present study the various treatments dealing with the
domains of respiration, phonation, articulation, resonance and prosody as recommended by Freed (2000) are given below in brief.

RESPIRATION

The various exercises recommended to strengthen the respiratory ability are as follows:

In slow and controlled exhalation technique the patients are asked to inhale fully followed by a slow exhalation for 3 seconds, stopping the exhalation for 1 second and again resuming it. Then in another technique the patients are trained to speak immediately on exhalation. In the optimal breath group task the patients are demonstrated on 'how many syllables and words can be said clearly on one full inhalation' (Freed, 2000:192).

PHONATION

The phonatory deficit in dysarthria generally affects the quality of the voice, the loudness level during speech (see Section 5.2.7). Depending on the type of the dysarthria and the nature of the problem various phonatory drills are recommended which are as follows:
Various head and neck relaxation techniques are recommended to the patients with phonatory problems. The other techniques suggested by Freed (2000) are yawn-sigh exercises where the patients are instructed to inhale slowly and open the mouth slowly and fully. This exercise helps in the relaxation of the neck muscles and in the reduction of the hypertension of the larynx.

In the easy onset of phonation technique the patient initially exhale while producing 'smooth, quite sigh' followed by a consistent prolonged phonation of an open vowel of /a/. Next, these prolonged phonations are shaped into words beginning with vowels. This exercise according to Freed helps towards easy phonations during conversation.

ARTICULATION

The articulatory deficits in dysarthria are mainly caused by the weakness of the articulators, their reduced speed and reduced range of movements needed for the precise production of the vowels and consonants. As treatment drills various tongue stretching exercises and lip stretching exercises are recommended by the clinicians along with various other articulation drills. The articulation drills are as follows:
In *intelligibility drill* task the patients are given a list of words and sentences, which they read out. The clinician identifies the speech sounds, which they fail to utter distinctly and demonstrates to them the method to produce the speech sounds precisely.

In the *phonetic placement* task ‘the clinician instructs the patient how to correctly position the articulators for a target phoneme before the patient attempts to produce that phoneme in a target word or sentence.… Many individuals with dysarthria know they are producing speech sounds incorrectly, but they do not understand what has gone wrong.… This treatment procedure can be useful for increasing awareness of many other articulation errors that can be so puzzling to someone who is unfamiliar with speech production.’ (Freed, 2000: 196).

Another task recommended as articulation treatment is the *exaggerating consonants task* also known as *overarticulation*, in which the patients are taught to fully articulate the consonants in all positions of the words.

In the *minimal contrast drill* the patients concentrate on a pair of words that vary only in one consonant or vowel. These ‘word pairs can be used alone, in phrases, or in sentences, depending on the needs of a
specific patient' (Freed, 2000:196). For example, in Bengali the voiced versus voiceless distinction can be practised with consecutive productions of *ban* 'flood' versus *pan* 'betel leaf'.

Further, intelligible drills which involve the production of small sets of words similar except for a single phoneme can be administered for better articulation. For example, Bengali word pairs like *khil* 'bolt', *khel* 'game', *khEl* 'you play', *khal* 'canal', *khOl* 'bad person' and *khol* 'you open'.

**RESONANCE**

The resonatory disorder on dysarthria as stated by Freed (2000:122) is mainly due to the 'incomplete elevation of the velum, which may cause hypemasal resonance'. Even though there are different opinions regarding the appropriateness of the velar strengthening and stimulation procedures for improving velopharyngeal closure, it is, nevertheless, recommended as it 'may be appropriate in fine tuning velopharyngeal closure in a patient with a palatal lift. During the adjustment period that takes place after the initial placement of a palatal lift, various blowing and sucking tasks may be useful'. He further mentioned that 'modification of various speech behaviours can minimize the effects of hypemasality in some patients'. In one such modification procedure of *increase loudness* the patients are recommended to talk loudly 'as the
perception of hypernasality can sometimes be minimized by having the patient speak more loudly. Louder speech tends to mask the Hypernasal resonance' (Freed, 2000:123).

*Reduce rate of speech* is also another such task where 'reducing the rate of speech also can increase intelligibility and lessen the perception of hypernasality' (Freed, 2000:124). *More open-position mouth during speech* task also helps in lessening the Hypernasal effect on speech. According to Freed (2000: 124) 'exaggerated jaw movements during speech...can lessen the perception of hypernasality.'

**PROSODY**

Depending on the type of the defective parameters in different types of dysarthria the clinicians recommend the drills for prosody. In general, the type of disorders encountered by the patients are related to the rate of speech and to stress (see Section 5.2.7). After Freed (2000) the following drills may be recommended for treating the prosodic problems:

For the patients who have difficulty in learning to speak slowly, a pacing board may be helpful. Pacing boards are divided into sections and the patient must tap one section every time as he pronounces a syllable.
Rate control is a kind of drill in which the dysarthric individuals are taught to slow down their speaking rate thus making the speech more intelligible. This can be practised by the finger or hand tapping task in which the dysarthric individuals reads a passage following the pace of clinician’s finger or hand tapping. In cue reading material task the clinician models the pace of reading which the dysarthric patient follows.

Various stress drills are also effective according to Freed (2000). In contrastive stress drills the clinician asks a question which the patient answers by placing stress on the key word of the answer. For example, when the clinician asks a Bengali dysarthric patient /apni ki khaben/ ‘What will you eat?’ The patient will reply, /ami bhat khabo/ ‘I will eat rice.’ The key word /bhat/ ‘rice’ is stressed in this sentence.

In pitch reading exercises the patient is asked to prolong the /a/ at his lowest and later highest pitch. Following this the patient reads from texts where the pitch changes are indicated.

In chunking utterances into syntactic units the patients are taught to ‘divide their utterances into normal pauses within and between sentences’ (Freed, 2000: 195). The patients are instructed to inhale at
those points in an utterance where a pause is necessary. For example, in the following Bengali sentence, inhalation by the patient will be conducted in the following manner:

/kal ami [inhale] khub bhore u'The [inhale] mondire jabo [inhale]/

‘Tomorrow I will get up early in the morning and go to the temple.’

Finally, all these intervention methods in respect of the patients suffering from dysarthria, as recommended by scholars, appear to be useful for the dysarthric Bengali patients also. Though it is not claimed that beyond the present study no other study is possible, yet it can be hoped that the findings of this study on the various kinds of Bengali dysarthric speech would be of some help to the speech therapists and clinicians in adopting subsequent intervention measures for the Bengali dysarthric patients as well as in planning for their clinical management.

REFERENCES

