

An Attempt at an Objective Method for Differential Diagnosis of Dysphonias*

JAYARAM, K.

The present study was concerned with obtaining norms for both males and females on some of the parameters related to voice and to compare these findings with those obtained for various dysphonics. It was also aimed to see if any significant differences are seen among several clinical types of dysphonias.

The following parameters were studied in the present study :

Natural frequency of vocal tract was determined by the procedure given by Nataraja (1972) ; and optimum frequency was computed by dividing the natural frequency by eight in males (Nataraja, 1972), and by five in females (Shantha, 1973).

The fundamental frequency of voice was read directly from the Tachometer used in combination with Stroboscope and SPL meter.

The frequency range was obtained by taking the difference between the highest and the lowest frequencies a person could produce.

Maximum duration of phonation was obtained by measuring the maximum

duration a person could sustain phonation at constant frequency and intensity levels.

Vital capacity was measured using an Expirograph.

The Mean Air Flow Rate during phonation was computed by taking the ratio between phonation volume (measured using Expirograph) and the duration in which it is obtained.

Vocal velocity index for each subject was computed by taking the ratio between mean air flow rate during phonation and vital capacity.

In order to study these aspects, the following hypotheses were advanced :

- (1) There will be a difference in the measures obtained for these parameters between the normal males and females.
- (2) There will be a difference in the measures obtained for these parameters between normals and dysphonics.
- (3) There will be difference in the measures obtained for these parameters between males and females of the dysphonic group.

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- (4) There will be a difference in the measures obtained for these parameters among different types of dysphonias.

Conclusions

- (1) *Optimum Frequency* : A significant difference in the optimum frequency for males and females in both the groups was observed. No significant difference between the males and females of the two groups was seen.
- (2) *Habitual Frequency* : A significant difference in the habitual frequency measures obtained for males and females in the normal groups and a significant difference between males and females of the two groups was also seen. However, in the dysphonic group, a significant difference between the males and females was seen only at 0.05 level of significance.
- (3) *Frequency Range* : No significant difference in the frequency range was obtained for males and females in the normal group at both the levels of significance, while the males and females in the dysphonic group differed only at 0.05 level of significance.
- A significant difference was found between males of the two groups at both the levels of significance ; and females of the two groups showed a significant difference at 0.05 level.
- (4) *Maximum Duration of Phonation* : A significant difference with respect to the measure of maximum duration of phonation was seen between the males and females of the normal group at both the levels, whereas in dysphonic group, no significant difference was seen between males and

females. A significant difference was seen between normals and dysphonics.

- (5) *Vital Capacity* : A significant difference in terms of vital capacity was noticed between the males and females in both the groups. No significant difference was seen between the males of the two groups. But, the females in the two groups differed significantly at both the levels of significance.
- (6) *Mean Air Flow Rate during Phonation* : No significant difference with respect to the mean air flow rate during phonation was seen between the males and females of the normal group, while a significant difference at both the levels was seen between the males and females of the dysphonic group. The males of the two groups differed significantly at both the levels, while no significant difference was seen between the two female groups.
- (7) *Vocal Velocity Index* : A significant difference with respect to vocal velocity index was observed between the males and females of both the groups. Males of the dysphonic group differed significantly from the normal males, while no significant difference between females of the two groups was seen.

Thus, a measure of these parameters indicates the possibility of its usefulness in differential diagnosis of dysphonias.

Recommendations

- (1) To carry out the study on a larger population of both normals and dysphonics.
- (2) To test varieties of dysphonia.
- (3) To carry out the study using more sophisticated instruments and then to derive simpler techniques of measuring these parameters, so that it can be used in all clinics with less expenditure.