

THE EFFECTS OF ELECTROMYOGRAPHIC BIOFEEDBACK (EMG-BFB) THERAPY ON THE CHARACTERISTICS OF STUTTERING

TATJANA PRIZL

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Stuttering is an action-induced speech disorder with involuntary, audible, or silent repetitions or prolongations in the utterance of short speech elements (sounds, syllables) and words. The responsibility of the speech-language pathologist is to provide direct, early intervention for stuttering and to choose justifiable treatment procedures. In this study we measured different manifestations of stuttering before and after electromyographic biofeedback (EMG-BFB) therapy. The EMG-BFB includes the recording of the muscle activity from surface electrodes, observation of biological signals, and provoking specific changes in the framework of the muscles. The manifest area of stuttering was measured by means of 9 variables. The result shows differences in the structure of the manifestations at the beginning and at the end of the EMG-BFB therapy. Besides lower tension in the larynx muscles, frequency in speaking and reading, and duration of block, changes in the quality of speaking and reading were also noticed, which imposes the necessity for a different approach to the diagnostics and therapy of stuttering.

In the diagnosis and therapy of stuttering there are no satisfactory methods for measuring the fluency and manifestations of speech. Most often it is prescribed by differently defined mistakes in speech given in percents of mistakes per one hundred spoken words, measuring the emission duration and blocks or observing distracting movements of extremities or facial grimaces. In the stuttering diagnostics the most commonly used scales are the Iowa Scale for Rating Severity of Stuttering (Johnson, Darley & Spriesterbach 1963, Sherman, 1952) and the Stuttering Severity Instrument for Children and Adults (Riley, 1972). Yet there is still a necessity for an objective instrument in order to describe the severity of stuttering and all other concomitants.

The regulational systems in humans accept information, compare them to the agreed standards and decide on the amount and the direction in which a correction should be made in order to that it agree with the confirmed information (Guyton, 1986). This means that there is no possibility of any kind of regulation without feedback on the information, and that their abilities to generate error-free speech programs are

disordered (Postma & Kolk, 1993). From the point of view of automatic regulation, speech is a very complex regulational system. In this context, stuttering can be observed as instability in the regulational system. Biofeedback is one of the procedures which helps us to make new feedback relations within the complex speech system and within the whole organism. During this procedure we use external technical tools for the observation of biological signals and procedures in order to induce changes within the system. The method that is most commonly used in practice is electromyographic biofeedback (EMG-BFB). It registers muscular potentials throughout different phases of speech and on different muscular clusters. The most interesting results are those obtained in the research of the relation of stuttering and EMG (Denny & Smith, 1992; Smith, Luschei, Denny, Wood, Hirano & Badylak, 1993). So far, all work and expe-

Tatjana Prizl, M. A. is an assistant at the Department of Logopedics, Faculty of Special Education and Rehabilitation, University of Zagreb
Correspondence to: Faculty of Special Education and Rehabilitation, University of Zagreb, Kušlanova 59a, 10000 Zagreb, Croatia