

## **Muscle Activity in Relation to Stuttering**

A. Smith, *West Lafayette, Indiana, USA*

Oral Presentation: 30 min.

One of the most salient features of stuttering, as reported by stutterers and clinicians, is that speech production is unusually "effortful," or involves high levels of "tension." Such observations generated two hypotheses: (1) muscle activity is excessive during stuttering, and (2) antagonist muscles are inappropriately co-activated, thus "blocking" ongoing speech. Early studies seemed to support these hypotheses.

The present report reviews evidence from recent studies of activity of orofacial, laryngeal, and respiratory muscles. These studies indicated that EMG amplitude does not follow a predictable pattern in stuttering. Indeed activity in some muscles appears to be "turned off" during disfluency. Furthermore, it is now clear that co-activation of muscles with antagonistic functions is the normal mode of muscle activation in speech. These recent studies have revealed abnormal timing of muscle activity, including tremorlike oscillations, in the speech of stutterers.

This body of research provides a basis for revising our notions about perceived effort in stuttering. Perhaps the sense of effort arises, not from the experience of "too much muscle activation," but from the experience of an unpredictable and unstable motor system, in which the precise timing necessary for normal speech production is disrupted.

## **The Development of Stuttering: Theoretical Framework and Preliminary Data**

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Oral Presentation: 30 min.

In past publications we have proposed a multifactorial theory of stuttering. This theory posits that many different factors, including psychosocial, emotional, linguistic, and motor, contribute to the development and maintenance of stuttering behaviors. An integrative view of these diverse factors is provided by the realization that, to produce stuttering, each of these factors must either directly or indirectly affect speech motor processes. In this paper, we apply this theory to the development of stuttering in preschool and school-age children. Two testable possibilities emerge. First, it may be that stutterers are those children who in early childhood fail to acquire stable motor templates for speech production. A second possibility is that stuttering emerges in children who have acquired normal motor templates, but that the execution of these templates is unusually sensitive to disruption by factors that are extrinsic to the motor system. Both of these may be possible paths to the emergence of stuttering in children.

## **A Comparison of Botulinum Toxin Injection and Clomipramine Treatments**

S. Stager and K. Siren, *Bethesda, Maryland, USA*

Oral Presentation: 15 min.

Eight subjects who were treated using both botulinum toxin injection (BOTOX), and clomipramine were studied to determine the effect of these two disparate treatments on their fluency. From videotaped speech samples of sentences in monologue and conversation, the following variables were calculated: percent fluency, speech rate,

number of disfluencies, average fluency duration, proportion of disfluencies of a single type, and proportion of primary disfluencies (repetitions, prolongations). Not all subjects improved under each treatment. The effects of BOTOX and clomipramine decreased average disfluency duration differently. BOTOX reduced the number of secondary types of disfluencies, while clomipramine reduced the number of multiple disfluencies.

### **Maintenance of Fluency Following Long-Term Clomipramine Treatment**

S. Stager, C. Ludlow, C. Gordon, M. Cotelingham, and J. Rapoport, *Bethesda, Maryland, USA*

Oral Presentation: 15 min.

Five subjects who completed a double-blind trial of clomipramine and desipramine elected to continue taking clomipramine for a year. After six months, subjects entered a second single-blind placebo trial during which they were given two months of clomipramine and two months of placebo. Percent fluency was computed from videotapes of subjects speaking in various situations. The greatest percent fluency levels occurred during the initial trial, but were not maintained after six months, despite subjective reports of continued improvement. Some subjects demonstrated greater fluency during clomipramine than during the placebo phase of the single-blind trial, but not to the same degree as their initial response. Objectively, subjects may not necessarily benefit from long-term clomipramine therapy.

### **Bilingualism in Young Disfluent Children**

V. Stahl and G. Totten, *Austin, Texas, USA*

Poster Presentation

This paper describes how bilingualism may exacerbate children's disfluencies, and discusses counseling issues concerning prevention of chronic stuttering in young bilingual children. Karniol (1992) hypothesized that bilingual children who stutter may experience linguistic interference, resulting in motor instability and increased disfluency. Karniol suggested limiting the disfluent child's exposure to a second language. However, counseling all bilingual families to limit themselves to one language may not be desirable or effective for the prevention of chronic stuttering. It is suggested that subgroups of bilingual children may be at-risk for chronic stuttering. For example, when genetic factors and/or developmental delays are present in disfluent children, families may be counseled to temporarily eliminate bilingualism in the environment. Once a child has a foundation in the first language, he may be ready to acquire a second language with less stress to his speech and language system.

### **The Van Riper Program as Intensive Interval Therapy**

A. Starke, *Hamburg, Germany*

Oral Presentation: 30 min.

For more than seven years this therapy program for adults who stutter has been held in Germany. It is an adaptation of Van Riper's program to a schedule that requires the group