Are non-speech oro-motor exercises more effective than speech exercises for improving intelligibility in adults with dysarthria?

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Non-speech oro-motor exercises (NSOMEs) are often used to strengthen and stretch the muscles of speech. Typical exercises include protruding and retracting the tip of the tongue, encircling the lips with the tip of the tongue, and alternating whistling and smiling[4].

The issue of using NSOMEs has been a topic of disagreement for many years, and researchers agree that there is an absence of solid understanding in this area [2,3,4,5]. Studies have shown that many therapists are employing these techniques; 81% of clinicians in the UK have used NSOMEs with clients with dysarthria[4], despite the lack of a reliable evidence base to prove the effectiveness of these interventions. The most common reason for using these exercises was to improve aspects of speech, including intelligibility[4].

Evidence Base

The use of NSOMEs was promoted and encouraged as early as the 1940s,[1] but since then, the effectiveness and use of the exercises has been disputed.

Researchers have shown positive improvements in intelligibility following treatment using NSOMEs[6]. However, this particular course of intervention was not replicable, it was not clear how the outcomes were measured, and there were only a small number of participants.

In addition to disagreements about the effectiveness of NSOMEs, there are also discrepancies about the rationale for using the treatment. Many authors argue that training the muscles of speech to improve their strength will result in improved intelligibility [1,6,7]. However, other authors suggest that weakness of muscles does not correlate to precision of speech [2,5], thus contradicting the rationale.

The physiological evidence for the use of NSOMEs has been discussed[2], and again found conflicting results. The use of NSOMEs is usually linked to the benefits of using exercises to strengthen limb muscles, however, this theory is not always correlated to the use of NSOMEs. Most of the muscles of speech do not exhibit the same muscle spindles or stretch reflexes as limb muscles, so the rationale for strengthening the muscles of speech based on this does not withstand. Clarke also highlights that the muscles used for speech often overlap and interact, therefore training individual muscles is not likely to result in functional improvements.[2]

As individual studies have failed to provide a definitive answer, clinicians could consider systematic reviews of the literature.[3,7] However, these reviews have been unable to collate sufficient evidence to either prove or disprove the effectiveness of NSOMEs. This is largely due to the limitations of many of the original studies; reducing the amount of reliable literature which could be included in the review. The authors also emphasised the complications in completing their reviews: the variability of treatment, patients, control and treatment groups, and outcome measures, which make comparison across studies problematic. In terms of improvement in intelligibility, the reviews found that the studies had conflicting results[3,8]. Considering all of the information, one review went so far as to conclude that the best option available is to use alternative speech treatments to NSOMEs, whose efficacy has already been established in the literature, especially when speech production or functional speech outcomes are the ultimate goals of intervention.[3]

The use of NSOMEs is advocated for some patients[5], for example strength training for people with non-progressive flaccid dysarthria, as weakness is the primary underlying impairment that contributes to the articulation deficits. However, it is highlighted that NSOMEs are probably only appropriate for “a small number” of patients. [5]

Conclusion

Many of the studies which have been conducted in this area have limitations, such as not being replicable, results which do not relate to functional speech, and only including a small number of participants. The lack of comparison groups, or the use of more than one therapy at a time does not allow for fair comparison between speech and non-speech oro-motor treatments.

These limitations have been problematic for authors collating data to conduct systematic reviews and meta-analyses, so that recent research has not been able to conclude either way as to the effectiveness of non-speech oro-motor treatments. The only issue authors do agree on is that further research is necessary, especially as this treatment is used by many therapists with a variety of clients.[2,3,4]

Clinical Implications

Although there is no general consensus, several researchers feel that the use of NSOMEs may have obvious benefits for some clients, and therefore are justified. However, there is also agreement that these therapies are not appropriate for all patients with dysarthria[2,5]. Due to the lack of evidence, some authors suggest avoiding NSOMEs in favour of other methods[3].

It is imperative that the therapist ensures that treatment is appropriately selected based on the client’s impairment and disease processes, and targets specific, functional outcomes, or the potential benefit of NSOMEs is extremely limited[2]. A useful and common conclusion of the research is to ensure that exercises are very close to the desired outcome[2,5]

“By matching the exercise as closely as possible to the desired movement outcome, specificity will be maximised – even when clear descriptions of the movement are lacking”[5]

References