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There is a continued need for empirical data supporting the treatment of people with aphasia in the acute care setting including the use of modified melodic intonation therapy

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Q: What are the immediate effects of Modified Melodic Intonation Therapy (MMIT) on the modified repetition and responsive subtests of the Western Aphasia Battery (WAB) in stroke patients with Broca's aphasia?

Methods

Design: Randomized, controlled single-blind design.

Allocation: Participants were randomly assigned to either the treatment or control condition using a randomization table.

Blinding: Blinded; the evaluators giving the pre- and posttest for each of the sessions were blinded to the treatment or control condition.

Study duration: The experimental protocol allowed for up to five sessions. However, more than two sessions were achieved for only four participants. Thus, this study essentially represents the data from two sessions of treatment.

Setting: This study was conducted in an acute care hospital with short patient stays.

Participants: The participants included 30 persons with aphasia (PWA): 14 in the control group and 16 in the treatment group.

Intervention: A modified version of Melodic Intonation Therapy (MIT) (Albert, Sparks, & Helm, 1973; Sparks & Holland 1976) was administered. Three specific modifications to original MIT (Albert et al., 1973; Sparks & Holland, 1976) were discussed. First, the therapist used novel phrases in which the prosody of the phrase matched more closely the pitch and rhythm of natural spoken phrases, instead of bi- or tri-tonal phrases used in standard MIT. Second, the therapist used full phrases during the initial treatment sessions, which differs from the abbreviated phrases used in the original treatment program. Finally, the treatment

was administered during the acute phase of patient recovery, in contrast to its typical use in the postacute phase. The treatment group received therapy in which the target phrase was spoken only one time at the beginning of the session. All other presentations of the stimuli were sung after the initial presentation had been spoken aloud once. The target phrase was modeled multiple times, and then the participant was instructed to sing the phrase. While the client sang the phrase, the therapist assisted him/her in tapping out the rhythm of the phrase with the left hand. Participants in the control group were also given sessions 10–15 minutes in length. These sessions included discussions of the participant's impairment, different types of treatment, possible outcomes, and concomitant issues commonly associated with aphasia (e.g. depression and withdrawal).

Outcomes: A pre/post-criterion measure based on subtests of the WAB (Kertesz, 2006) was used to measure change. No validity measures were reported for the criterion measure. Two nursing managers blind to treatment assignment presented the pretest and the posttest measure; they were not present during the treatment or control condition. A board-certified music therapist worked for 10–15 min with individuals in the treatment and control conditions and was blinded to the pretest and posttest scores until after the session was complete. In addition to the pre/posttest scores, the number of times the participant was prompted to sing the phrase, how many times the phrase was completed, and the number of partial phrases produced were recorded in the treatment group. However, the data reported in this study focused only on pre/posttest scores of the criterion measure for the treatment and control groups.

Attrition: With regard to the control group, out of 14 enrolled participants, 10 had pre/posttest scores for Visit 1 and 8 had pre/posttest scores for Visit 2. This represents an attrition of 28.5% (4 par-

ticipants) at Visit 1 and total attrition of 42.8% by Visit 2 (6 participants). The treatment group started with 16 participants, with 14 completing Visit 1 and 9 completing Visit 2. This is an attrition of 12.5% (two participants) at Visit 1 and 43.7% total attrition by Visit 2 (7 participants).

Main Results

The authors display, in table format, the baseline comparison of participants for the two groups (control and treatment). Additionally, they include three tables, which summarize the complete results for Visit 1, the difference in prescores from Visit 1 to Visit 2, and the main adjusted scores for each assessment item. The control group showed no significant changes in pre/posttest scores (Items 1–3) for the adjusted total ($p = .73$), responsive items ($p = .74$), and repetitive items ($p = .70$). Post hoc analysis (Items 2–3) also showed no significant difference for the adjusted total ($p = .36$), responsive items ($p = .29$), and repetitive items ($p = .40$) in the control group.

The treatment group demonstrated significant changes in pre/posttest scores (Items 1–3) for the adjusted total ($p = .02$). Post hoc analysis (Items 2–3) showed significant differences for the adjusted total ($p = .01$) and responsive items ($p = .02$). No significant difference was reported for repetitive items in the treatment group (Items 1–3, $p = .06$; Items 2–3, $p = .10$). Effect sizes were reported for the pre/posttest scores for Visit 1 as .83 for adjusted total, .57 for the responsive items, and .62 for the repetitive items.

Additionally, the authors reported changes in the pretest scores for both the control and treatment groups from Visit 1 to Visit 2. The control group improved in the adjusted total score ($p = .03$) and the repetitive items ($p = .04$). The treatment group improved in adjusted total ($p < .01$) and responsive items ($p = .01$). Effect sizes for the treatment group were reported as .67 for the adjusted total and 1.08 for the responsive items.

Authors' Conclusions

The authors concluded that individuals with aphasia experienced significant immediate improvements in speech output after one session of MMIT. Both the control and treatment groups showed significant change in pretest scores from Visit 1 to Visit 2. The control group's change was from improvement in repetition items, whereas the treatment group showed significant gains in responsive items. The authors suggest that the changes in responsive scores for the treatment group indicated a carryover effect of MMIT. The authors reported that the changes in the pre/posttest scores within the treatment group and between the control and treatment group for Visit 1 represent a potential generalization effect of MMIT rather than a training effect. They base this conclusion on an analysis that removed the trained item from the mean scores and subsequently revealed a difference on untrained items. The authors also note that the participants spoke their responses during the posttesting rather than singing them. Theoretical underpinnings of traditional treatment and the role of the right hemisphere in recovery are discussed. The authors propose that MMIT may assist in right-brain recruitment to improve speech output primarily associated with left-brain damage. The authors suggest that providing MMIT early may lessen frustration and withdrawal by patients with aphasia. They point to their data, which showed that 75% of participants in the treatment group sang one complete and accurate phrase during the first session of MMIT. This production of meaningful output was postulated to be a sign that frustration and withdrawal would be reduced as patients realized they could produce meaningful output. Some potential limitations of the study were identified by the authors and included completion of only one to two sessions by participants, a small sample size, the absence of long-term follow-up, and the need for further development of the outcome measure. The authors advocate for the use of MMIT early in the recovery process of patients with nonverbal Broca's aphasia.

Commentary

This study makes a contribution to the evidence-based literature regarding the use of a modified form of MIT (Albert et al., 1973; Sparks & Holland, 1976) in acute rehabilitation. Information on the effect of speech language treatment in the acute phases of recovery is needed. The choice to use MIT was strongly based on it being one of the first systematic treatment approaches found in the literature (van der Meulen, van de Sandt-Koenderman, & Ribbers, 2012). While the undertaking of a randomized control trial in an acute care setting is commendable, some limitations of the validity and reliability of this study should be addressed. Clinically, clinicians should carefully consider how and when to apply treatment in these settings. Historically, there has been some controversy about the application of treatment in acute care. Specifically, Duffy, Fossett, and Thomas (2010) cautiously suggest that many patients with aphasia in acute care are not prepared physically or emotionally for impairment-based treatment. Fridriksson and Holland (2001) advocate speech pathology services in acute care settings that focus on patient and family education, counseling, and social support. The current study has provided some limited evidence that early engagement in therapy may be beneficial. However, some aspects of this study warrant further discussion.

First, while it is understandable that short stays in acute care may impact data collection, the results of this study reflected only one complete session of MMIT treatment. The authors indicated that they planned to complete up to five treatment

sessions, but by Session 2 the total attrition rate was approaching half of the enrolled participants in both groups: 42.8% for the control group and 43.7% for the treatment group. Dollaghan (2007) states that systematic differences between participant groups may exist unless attrition occurred for completely random reasons. This has potential to threaten the internal validity of the study. The authors did not provide detailed information for the reasons behind their attrition rates beyond the nature of the acute care setting. The similar total attrition rates that occurred in the control and treatment groups by the end of Session 2 suggests similarity between the two groups. On the other hand, the attrition rate of the control group (28.5%) was more than double that of the treatment group (12.5%) for Session 1. Some information demonstrating the equality of participant's characteristics for those lost to attrition and for those completing the study would clarify potential threats to validity. No intention to treat analysis was noted.

The second area of discussion is the outcome measures utilized. The validity of the pre/posttest measure could be improved. The authors admitted that this tool needed further development. In the development stage they identified the WAB (Kertes, 2007) as a theoretical model. However, there is a concern that the items presented in the study's outcome measurement tool are not theoretical matches to the constructs of the WAB. For example, the WAB assesses responsive speech through simple sentences (e.g., "Where can you get stamps?" p. 9). The items in the authors' version were scenario-based (e.g., "When you are thirsty and need a drink of wa-

ter what do you say to the nurse when she comes in?" p. 1465). Granted the authors created the stimuli to elicit longer responses from participants, but, as described, these items appear to increase the working memory and cognitive demands (i.e., role play) of the task.

Third, there was a general lack of reliability data. The reliability of pre/post-test measures collected by the two nursing managers was not provided. Specifically, reliability with regard to following the collection procedures was not delineated, nor was there reliability data regarding the accuracy of data collection between the two nursing managers. Additionally, no data to demonstrate the fidelity of the actual treatment sessions by the therapist who provided treatment were presented. This raises concerns that the treatment across participants may not have been implemented as planned.

Fourth, there is a lack of maintenance and generalization data within the study. Specifically, no follow-up maintenance data were collected. Therefore there is no evidence that the treatment effects were not transient. While it is interesting that the participants showed change during just one treatment session, and that there was change from Visit 1 to Visit 2, there is little evidence to support a lasting treatment effect. No data were given with regard to generalization of skills to other contexts. Data regarding the actual communication abilities of the participants within authentic communication contexts (e.g., during spontaneous interaction with a spouse, the participant asks for a drink of water) would be needed to determine the generalizability of the intervention outside experimental contexts.

Lastly, with regard to social validity, while the authors discussed a positive implication for depression and withdrawal, specific data were not collected for those concomitant conditions. Data collected from family members, hospital staff, and other visitors regarding their impressions of the participant's emotional state would have lent credence to these claims.

In conclusion, while this study had several limitations, the basic premises—the exploration of the effectiveness of changes to traditional MIT and the exploration of treatment in very acute stages—were valuable. Further systematic lines of research exploring the effect of various treatments and responsiveness to treatment in subsets of people with aphasia should be undertaken. The authors of this study should be commended for their efforts to utilize a systematic approach to further our knowledge of the impact of MMIT and acute rehabilitation.

Declaration of interest: The commentary authors report no conflicts of interest and are solely responsible for the content and writing of this structured abstract.

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