Melodic Intonation Therapy in subacute aphasia

Introduction

Melodic Intonation Therapy (MIT)[1] is based on the observation that persons with severe nonfluent aphasia are often able to sing words or even short phrases they cannot produce during speech. MIT uses the melodic elements of speech, such as intonation and rhythm, to facilitate and improve language production. Although clinicians disagree about the usefulness of MIT, it has been translated into several languages and is frequently applied worldwide. Many studies have reported successful application of MIT.[2-4] However, most studies are case-studies without control condition in chronic patients. Hence, the level of evidence for MIT is low and little is known about its effect in earlier phases post stroke, when treatment interacts with processes of spontaneous recovery.[5]

We examined MIT in the subacute phase post stroke. The purpose of this multicenter study was threefold. First, we evaluated the efficacy of MIT in the subacute phase. Further, we examined the effect of the timing of MIT in this early phase post stroke. Thirdly, we investigated potential determinants influencing therapy outcome.

Method

Design

An observer-blinded waiting-list randomized controlled design was used (Figure 1). Patients in the experimental group received six weeks intensive MIT (5 h/wk). After completion of MIT, the choice of treatment was free. Patients in the control group received six weeks control therapy (5h/wk), followed by six weeks MIT (5h/wk). Assessments were performed at baseline (T1), after the first treatment phase of six weeks (T2) and six weeks later (T3) (Figure 1).

Participants

Participants were recruited in 15 aphasia treatment services from 2009-2011. Inclusion criteria were: aphasia after left hemisphere stroke, time post stroke 2-3 months, premorbidly right-handed, age 18-80, native speaker of Dutch, MIT candidate. MIT candidacy is defined in the literature as non-fluent aphasia, language repetition severely disordered, articulation deficits, moderate to good auditory comprehension.[6] Exclusion criteria were: prior stroke resulting in aphasia, bilateral lesion, intensive MIT prior to start of the study, severe hearing deficit, premorbid dementia, psychiatric history relevant to language communication.

Interventions

In MIT, aphasic patients and the speech language therapist (SLT) together sing short phrases (e.g. How are you?), while tapping the rhythm with their left hand. Gradually, the support from the SLT decreases and singing is replaced by speaking. During MIT no other language therapy was allowed. The control intervention did not focus on verbal production, but on other linguistic modalities usually trained in severe aphasia: writing, language comprehension, and nonverbal communication..

Outcome measures

Outcome measures were the Sabadel story retell task[7], the Amsterdam-Nijmegen Test for Everyday Language (ANELT)[8], Aachen Aphasia Test[9] subtests naming, repetition and comprehension, the MIT repetition task. This latter task was designed for this study and comprises 11 trained utterances and 11 matched untrained utterances, to examine the direct effect of MIT on the repetition of trained utterances and its generalization to untrained material. Naming was assessed to examine further generalization to word production. Generalization to functional language use was examined by the ANELT and the Sabadel, respectively assessing verbal production in daily life communicative situations and the production of connected speech.

Results

A total number of 27 patients were included in the study, 16 were allocated to the experimental group (direct MIT) and 11 to the control group (delayed MIT). Figure 1 illustrates the CONSORT diagram of patient flow.

Efficacy

At T2, the MIT group showed significant improvement on all outcome measures, except the Sabadel. By contrast, the control group showed significant improvement only on the MIT repetition task. A linear regression analysis, corrected for baseline, revealed a significant difference in improvement at T2 between the MIT group and the control group on the MIT repetition task (β=18.3, p=.007). The difference between both interventions was significant for trained (β=15.0, p=.001), but not for untrained items (β=3.3, p=.249). Further, a trend for the improvement on the ANELT, in favor of the MIT group (β=4.1, p=.067) was observed. The mean improvement in the MIT group was 6.6 points, approaching the clinically relevant difference of 7 points as defined in the ANELT[8], versus 2.3 points in the control group.

Timing

Compared to the experimental group that received MIT immediately after inclusion, at 2.5 months post onset (T1-T2), the control group started MIT six weeks later (T2-T3). A mixed model analysis examining differences over time (T1, T2, T3) showed a main effect of time for all outcome measures, indicating that language production improved over time in both intervention groups. When comparing both groups, only the T1-T2 MIT group showed a significant effect of time on the AAT naming task (F=19.92, p<0.001), the ANELT (F=8.81, p=.004) and the Sabadel (F=5.30, p=.02). Figure 2 illustrates the improvement on these outcome measures for both intervention groups. The effect of timing was further analyzed by a linear regression analysis comparing the effect of MIT versus delayed MIT. The T1-T2 MIT group improved significantly more on the ANELT (β=6.1, p=.02) and on the repetition of untrained items (β=7.97, p=.02) than the delayed MIT group.

Determinants

We examined the following possible determinants for therapy outcome: age, gender, severity of the aphasia, patients' linguistic profile at the start of MIT (language repetition, auditory comprehension, semantic knowledge). None of these variables affected therapy outcome.

Discussion

This is the first study showing that MIT has a positive effect on language production in subacute aphasia: we found significantly more improvement on language repetition after MIT than after a control treatment of the same intensity, and starting at the same time post stroke. Further, the considerable difference on the ANELT between the MIT and the control group suggests that the effect of MIT is not limited to language repetition, but generalizes to verbal communication in daily life.

The contrast between trained and untrained material, with a larger effect for trained material, is clinically relevant. These results underline the importance of carefully selecting utterances to be trained. MIT should be tailor-made, training sentences that are functionally relevant for the individual patient..

The timing of aphasia therapy is a clinically important issue. Many clinicians believe that earlier intervention yields larger improvement, although the evidence for early treatment is not yet well-established.[10,11] In our study, we were able to assess the effect of delaying a specific therapy method. We found a clear effect of timing: a delay of only six weeks was related to less improvement, especially in tasks reflecting functional verbal language production.

All patients fitted the clinical profile of MIT candidates. Still, large individual differences with respect to MIT success were found. In order to implement MIT more effectively in the clinical practice, stricter criteria are required. Unfortunately, we were unable to detect any determinants influencing therapy outcome.

This study suggests that MIT is effective in severe aphasia in the subacute phase post stroke and that timing is an important factor related to MIT success. One of the limitations of the study is its small sample size. Larger group studies examining aphasia treatment in the early phases post stroke are badly needed to obtain more insight in clinically highly relevant issues as efficacy and timing of aphasia treatment in the first year post stroke.[12]

References

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Figure 1

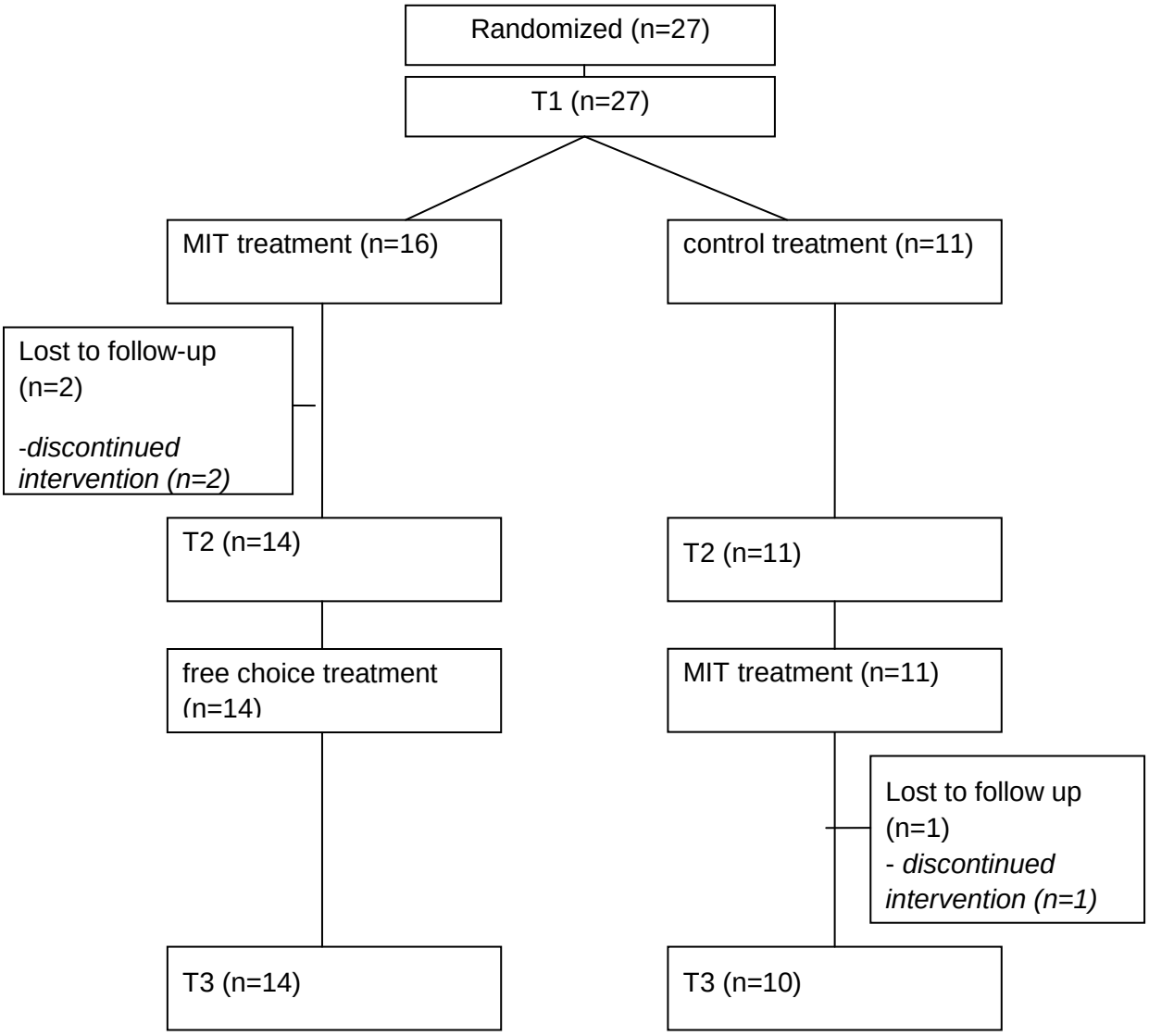
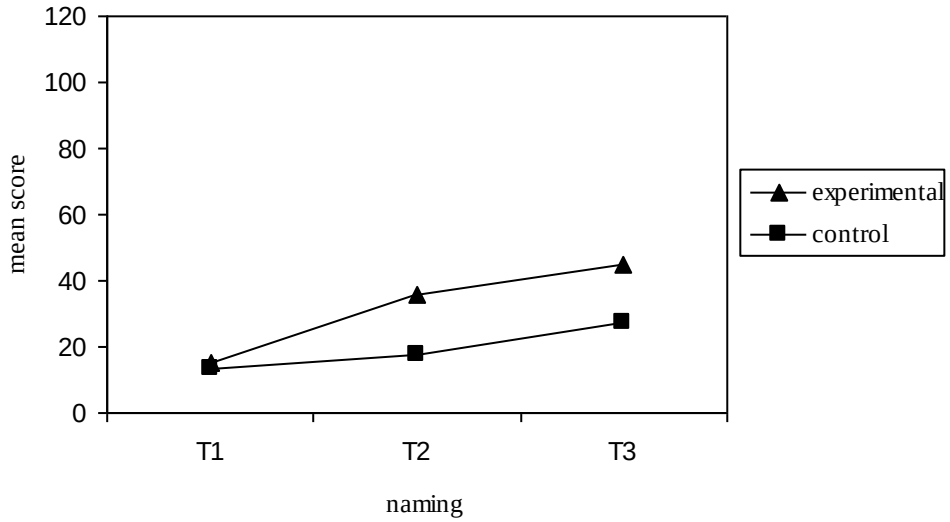

Randomized (n=27)
T1 (n=27)
MIT treatment (n=16)
control treatment (n=11)
Lost to follow-up (n=2)
-discontinued intervention (n=2)
T2 (n=14)
T2 (n=11)
free choice treatment (n=14)
MIT treatment (n=11)
Lost to follow up (n=1)
- discontinued intervention (n=1)
T3 (n=14)
T3 (n=10)

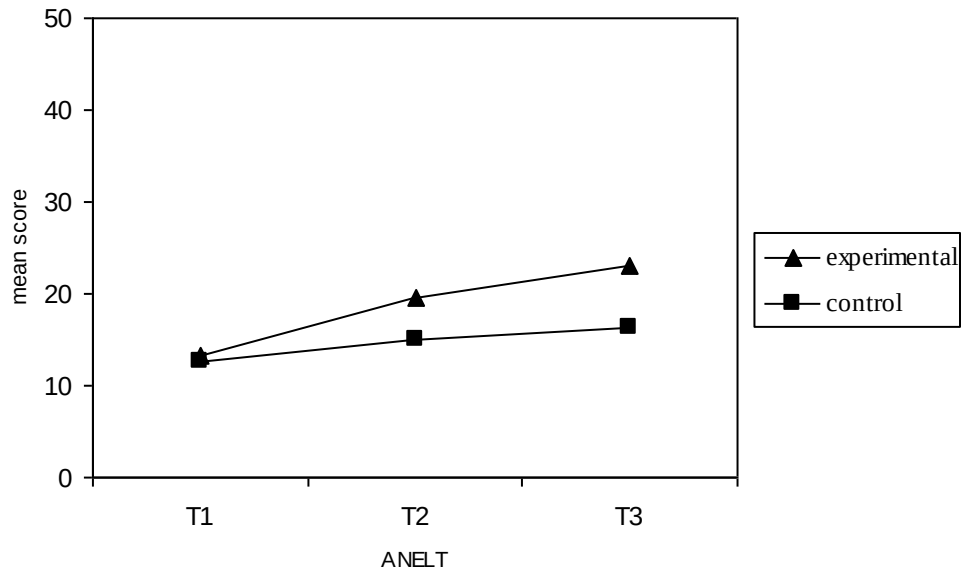
Figure 2

Mean score at T1, T2 and T3 on naming (A), ANELT (B) and Sabadel (C)

A.



B.



C.