

SUMMARY

Long-Term Improvements After Multimodal Rehabilitation in Late Phase After Stroke

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A randomized controlled trial

Background and Purpose

This study addresses 3 important clinical questions concerning the rehabilitation of stroke survivors. Is further recovery possible once patients are returned to the community having completed an acute/subacute-stage rehabilitation program? Can interventions that address a range of functional deficits and behavioural limitations be effective and lead to improvement? Can such interventions lead to sustained recovery in late phase after stroke? Treatment strategies using multimodal approaches and stimulating environments may hold some answers to these questions. Multimodal interventions are designed to engage patients in concurrent physical, sensory, cognitive, and social activities. They are attractive for complex conditions like stroke because they target a range of functions. There is also emerging support for the contention that a combination of different modalities, rather than the individual components, may produce additive or synergistic effects on brain plasticity underpinning stroke recovery.

Treatments that improve function in late phase after stroke are urgently needed. Assessed is whether multimodal interventions, based on the rhythm and music method developed by **Ronnie Gardiner** (in this summary R-MT) or horse-riding therapy (HR-T), could lead to increased perceived recovery and functional improvement in a mixed population of individuals in late phase after stroke.

Methods

Participants: 123 participants were included and randomly divided into three groups:

- 41 people received HR-T; 12 weeks, 2 sessions of 4 hours a week;
- 41 people received R-MT; 12 weeks, 2 sessions of 1,5 hours a week;
- 41 persons were classified in the control group with no other special activity;

Note: because of the difference in the amount of time spent per intervention, R-MT for 3 hours a week and HR-T for 8 hours a week, both interventions will not be compared in this summary. In this summary the results of the R-MT are compared with the control group.

The participants were recruited from a hospital-based register covering patients treated for ischemic or hemorrhagic stroke at the Sahlgrenska University Hospital in Gothenburg, Sweden. The eligibility criteria were subsequently widened to allow recruitment of individuals who had their stroke ≥ 10 months and ≤ 5 years before enrolment. All scored 2 or more on the modified Rankin scale, the age of the participants was between 50 and 75 years.

Used measuring instruments:

- SIS (Stroke Impact Scale) 2.0, item 9 (Self-Improved Recovery)
- TUG: Timed up and go test (run and balance)
- Mountain Balance scale (walking and balance)
- Bäckstrand, Dahlberg and Liljenäs Balance Scale (BDL-BS) (walking and balance)
- Grippit (crushing hands)
- Barrow Neurological Institute Screen BNIS (General Cognitive Level)
- Letter-number sequencing test LNS (working memory)

Evaluation moments:

- Prior to the intervention
- Immediately after the twelve-week intervention (postintervention)
- Three months after the intervention
- Six months after the intervention

Results

• SIS:	postintervention:	38% improvement (control group 17%)
	after 3 months:	55% improvement (control group 22%)
	after 6 months:	43% improvement (control group 22%)
• TUG test:	postintervention:	0.58 improvement (control group 1.78 decline)
	after 6 months:	1.08 improvement (control group 1.34 decline)
• Berg Balance scale	postintervention:	0.98 improvement (control group 0.12)
	after 6 months:	1.21 improvement (control group 0.20)
• BDL Balance Scale	postintervention:	2.72 improvement (control group 1.03)
	after 6 months:	2.53 improvement (control group 1.78)
• Grippit right	postintervention:	9.79 improvement (control group 5.13)
	after 6 months:	10.80 improvement (control group -1.33)
• Grippit left	postintervention:	17.26 improvement (control group 0.55)
	after 6 months:	15.06 improvement (control group -7.22)
• BNIS (cognition):	postintervention:	0.66 (control group 0.56)
	after 6 months:	1.29 (control group 1.07)
• LNS (working memory)	postintervention:	0.92 (control group 0.18)
	after 6 months:	1.15 (control group 0.10)

The control group was offered the R-MT twice a week for a period of 12 weeks after the study was concluded. After these 12 weeks the participants scored the same in the SIS (Item 9, Self-Improvement Recovery) as the R-MT research group.

Summary

This study demonstrates that multimodal rehabilitation can lead to meaningful and sustained improvement when applied to individuals with moderate levels of disability in the late post stroke stage. It also shows the promise of using different modality combinations to address the individual needs of stroke survivors. These results support long-term engagement in multimodal rehabilitation programs for individuals with persistent disabilities after stroke.

Conclusion

Multimodal interventions can improve long-term perception of recovery, as well as balance, gait, grip strength, and working memory in a mixed population of individuals in late phase after stroke.

Note.

This summary is written by Mariken Jaspers, m.jaspers@rgm-nederland.nl, physiotherapist and co-founder of RGM Nederland. The full-text publication can be found at <http://stroke.ahajournals.org> .