TECHNOLOGY-SUPPORTED LANGUAGE REHABILITATION IN POST-STROKE APHASIA: A CLINICAL CASE STUDY

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Abstract

Aphasia is a common consequence of stroke that significantly impairs language comprehension, verbal expression, reading, writing, and functional communication. Broca's aphasia is characterized by non-fluent speech, impaired naming, and reduced verbal output despite relatively preserved comprehension. While conventional speech and language therapy remains the cornerstone of aphasia rehabilitation, artificial intelligence (AI) and technology-supported applications offer opportunities to enhance therapy intensity, individualized practice, and patient engagement. This case study aimed to describe the clinical outcomes of integrating technology-supported language rehabilitation with conventional speech and language therapy in a patient with post-stroke Broca's aphasia. A prospective single-case study was conducted involving a 56-year-old male with moderate Broca's aphasia following a left intracerebral hemorrhage involving the left lentiform nucleus. Baseline language assessment was performed 4 days after stroke onset using the Mississippi Aphasia Screening Test (MAST), with a score of 13. The participant received intensive speech and language therapy five days per week for 12 weeks, incorporating Semantic Feature Analysis, Phonological Components Analysis, Melodic Intonation Therapy, naming therapy, auditory comprehension training, conversational therapy, caregiver communication training, and a structured home practice programme. The free version of the Tactus Therapy application was incorporated into every therapy session to provide structured language exercises targeting comprehension, naming, and reading. Outcomes were evaluated after 12 weeks using the MAST and clinical observations. Following intervention, the MAST score improved from 13 to 20, with gains observed in auditory comprehension, naming, reading, communication confidence, and participation in daily activities. Positive feedback from both the participant and family members indicated increased motivation and engagement, suggesting that the digital application complemented clinician-led therapy by providing additional opportunities for structured language practice. Given the single-case design, the observed improvement cannot be attributed solely to the intervention, as spontaneous neurological recovery and other rehabilitation-related factors may have contributed to the outcome. Further controlled studies with larger samples are required to establish the effectiveness and long-term clinical benefits of AI- and technology-supported rehabilitation.

Keywords: AI- and technology-supported rehabilitation, Aphasia, Stroke Rehabilitation, Language Therapy, Digital Health