

greater improvement with reality orientation.^{40,42,43} In particular, Hart and Fleming⁴⁰ reported remarkable effects using a modified reality orientation incorporating social reinforcement and certain recognition tasks. However, the results of two other studies did not favor reality orientation.^{44,45}

The above findings suggest that although the formal reality orientation is indeed an effective therapy, its limited generalization to other cognitive behavioral disorders and the lack of robust evidence of a better effect over other therapies are unsolved problems. In the future, well-structured reality orientation should be conducted by experts in neuropsychology who have considerable knowledge about the nature of the defect and residual capability of patients with dementia and other conditions.

Metacognition Improvement

Many amnesic patients cannot assess their memory impairment correctly, or are not aware of the insults at all. Amnesic patients' failure to use memory strategies and lack of generalization of the rehabilitation effects are often attributed to the lack of metacognition. Recently, approaches to improve metacognition, or self-assessment of the memory disorder, have been attempted.

For example, Vroman *et al.*⁴⁶ attempted to improve metacognition in various test items using computer feedback to confront the subjects with their errors. With respect to the inability to use memory strategies spontaneously, some reports^{47,48} have indicated improvement by teaching the patients an acronym for using memory strategy. For example, the acronym used by Lawson and Rice⁴⁸ was WSTC (W: What are you asked to do?; S: Select a strategy for the task; T: Try out a strategy; C: Check out how the strategy is working). They applied this technique to patients with post-traumatic amnesia and showed an improvement in the results of various memory tasks and learning of names of places and objects. Unfortunately, this effect was not generalized to other tasks outside the training.

The ultimate goal of any cognitive rehabilitation is independence in functional living activities, thereby improving the patient's work or study skills. Therefore, long-term maintenance and generalization of the use of memory strategies is the most important and indispensable research topic in memory rehabilitation, and further efforts in these areas are expected.

Part II: Cognitive Rehabilitation for Patients with Korsakoff Syndrome

Teaching and Acquisition of Domain-Specific Knowledge

Introduction

Previous studies in the past two decades have demonstrated that patients with memory disorders were capable of learning some information through cognitive rehabilitation. However, subjects of each study have disorders of various etiologies, hence interpretation of the efficacy of a given training technique is often difficult. Studies of such subjects, on the one hand, may have interesting implications for understanding the nature and variability of recovery. However, for practical purposes, this could be a drawback since the best rehabilitation program for a particular group of patients cannot be identified. It is reasonable to speculate that severity of amnesia is clearly not the sole determinant of learning capacity; the etiology may be equally important. That outcome studies from cognitive rehabilitation programs vary widely may be attributed to the heterogeneity of the amnesic subjects.

Here we present a rehabilitation program, the subjects of which are limited to alcohol-related Korsakoff syndrome. Given the large amount of literature concerning neuropathology and neuropsychology of these amnesic subjects, we predicted that the results of this cognitive rehabilitation would contribute greatly to the theoretical aspects of memory disorder, besides being of benefit to the participating subjects. However, deficits in motivation and problem-solving capability, often considered as signs of frontal lobe dysfunction of these patients, may be an obstacle to the training. Specifically, application of externally assisted approaches (e.g. diary and alarm clock) and memory strategies (e.g. visual images and the beginning sound of a word method) are expected to be more difficult than in amnesia of other causes such as postencephalitic sequelae.⁴⁹

The method we chose was the domain-specific knowledge learning technique advocated by Glisky and Schacter, which was shown effective for frontal lobe patients. Given the poor motivation of Korsakoff patients, we speculated that learning items should be directly associated with real-life functions, and tried to train them to memorize the names of ward staff (domain-specific knowledge) through repetitive practices.⁹

Subjects

We studied 5 patients with Korsakoff syndrome secondary to alcoholism (mean age: 50.0 years, all males),