

REGULAR ARTICLE

Training of attention and memory deficits in children with acquired brain injury

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Abstract

This pilot study concerns cognitive rehabilitation of children with acquired brain injury (ABI).

Aim: The aim is threefold; to determine (1) whether the Amsterdam Memory and Attention Training for Children (AMAT-C) programme for children with ABI can be integrated in the child's school, (2) whether supervision in the school-setting maintains the child's motivation throughout the training programme and (3) whether positive changes in memory, attention and executive functions are found with this implementation of the training method.

Methods: Seven children with memory and/or attention deficits after ABI were trained with AMAT-C. Measures used were programme evaluation questions, neuropsychological tests and a questionnaire concerning executive functions.

Results: Overall, children, parents and trainers were satisfied with the programme and the children were motivated throughout the programme. The children showed significant improvements in neuropsychological subtests, primarily in tests of learning and memory. No overall change in executive functions was noted.

Conclusion: Provision of AMAT-C training and supervision at the child's school appears to ensure (1) satisfaction with the programme, (2) sustaining of motivation and (3) improvements in learning and memory.

INTRODUCTION

Children with acquired brain injury (ABI) are rarely offered training programmes designed for children focussing specifically on reducing memory as well as attention deficits. This despite the fact that memory deficits are a known ABI sequela, at least for some aetiologies such as traumatic brain injury (1), and that attention deficits are a documented ABI sequela typically affecting selective and sustained attention (2).

Attention and memory deficits in children with ABI are very important issues to address as such deficits reduce the child's ability to acquire essential knowledge, which in turn influences quality of life both from short- and long-term perspectives (3). For example, memory and attention deficits reduce the child's ability to acquire full education thereby jeopardizing job opportunities (4).

Unfortunately, only a few studies exist which focus on developing and evaluating paediatric rehabilitation

methods for children with ABI as well as meeting criteria for evidence-based interventions. For reviews see e.g. (5–7), for level 2 intervention studies [as defined by the *Clinical Practice Guideline Process Manual*(8)] see (9–11).

Several different intervention models targeting ABI sequelae exist and it is debated which model is most effective and cost-efficient in the post-acute phase. The intervention models differ depending on whether focus is on functional adaptation, restorative intervention or a more holistic, context-sensitive approach focussing on quality of life (12). The models also differ regarding locus of intervention, length and intensity. Some take place in centralized, intensive rehabilitation facilities, which are often offered in the post-acute phase (4,11,13), while less intensive rehabilitation facilities may offer services on a weekly or monthly basis (14), potentially throughout childhood. Sohlberg and Mateer state that the primary context for rehabilitation for children with ABI after the acute and sub-acute stages is the school (15).

The focus of this study was to find an intervention method suitable for adaptation into the individual child's school, which included training of memory and attention as well as metacognitive elements.

The purpose of placing intervention in the school-setting was to augment possibilities of transferring trained skills to the child's everyday learning context and to prevent negative social consequences of an intensive training programme that keeps the child from participating in daily school life with peers.

Abbreviations

ABI, acquired brain injury; AMAT-C, Amsterdam Memory and Attention Training for Children; BRIEF, behaviour rating inventory of executive functions; N, number; P, probability; RAVLT, Rey auditory verbal learning test; RCFT, Rey complex figure test and recognition trial; SD, standard deviation; SPSS, Statistical Package for the Social Sciences; TEA-Ch, Test of Everyday Attention for Children; WISC-III, Wechsler Intelligence Scale for Children III.