

## Short Communication

## Can EMDR Reduce Autism Symptoms in Youngsters?

Leuning EM<sup>1\*</sup>, Berezowska A<sup>1</sup>, Van Dongen-Boomsma M<sup>2</sup> and Staal WG<sup>3,4</sup><sup>1</sup>Karakter Child and Adolescent Psychiatry University Center, Netherlands<sup>2</sup>Department of Cognitive Neuroscience, Radboud University Medical Center, Netherlands<sup>3</sup>Department of Psychiatry, Radboud University Medical Center, Netherlands<sup>4</sup>Leiden Institute for Brain and Cognition, Netherlands

\*Corresponding author: Leuning E, Karakter Child and Adolescent Psychiatry, Reinier Postlaan 12, Nijmegen, Netherlands

Received: September 30, 2017; Accepted: November 17, 2017; Published: November 24, 2017

## Abstract

Autism poses substantial challenges for both youngsters and their families, as it limits adaptability to and participation in different aspects of daily life. Although the search for effective treatments for autism is in full swing, so far there is no treatment that significantly reduces its core symptoms. Hence, identifying effective treatments remains vital. This report presents a single case study regarding the effect of Eye Movement Desensitization and Reprocessing (EMDR) on the core symptoms of autism in youngsters. The subject investigated in the current study was a 15-year old Caucasian male diagnosed with ASD, who did not suffer from any other psychiatric disorder or trauma. EMDR treatment consisted of ten weekly sessions that focused on stressful daily life events. Core symptoms of autism were assessed using the SRS-A and the ADOS-2. In addition to the quantitative measures, qualitative data were obtained. Both quantitative and qualitative analyses suggest that EMDR mainly reduces ritualized behaviors such as rigidity and repetitivity.

**Keywords:** Autism; EMDR; Children; Rigidity; Repetitively

## Introduction

Autism Spectrum Disorder (ASD) is characterized by a disturbance in central coherence (i.e. the capacity to integrate a multitude of information into a meaningful whole) [1]. This disturbance, among others, impairs executive functioning and induces stress, which results in a reduced quality of life [2]. Considering the negative impact of ASD on quality of life, identifying treatments that reduce the core symptoms of ASD is vital.

Eye Movement Desensitization and Reprocessing (EMDR) [3], is an effective treatment for patients with Post Traumatic Stress Disorder (PTSD) [4]. Recently, we observed that several patients diagnosed with ASD and treated with EMDR not only improved with respect to their trauma-related symptoms, but also showed marked improvement on core characteristics of ASD such as rigidity, social interaction, and communication. These unexpected observations may be related to impaired connectivity, which is found in ASD and thought to diminish the functionality of complex cognitive and social neuronal networks [5]. Recent research suggests that EMDR might improve functional long-range connectivity [6]. Building on this suggestion, we hypothesize that through improving connectivity EMDR is able to increase the integration of information processing, which in the end may reduce the core symptoms of ASD. To further explore this hypothesis, we here present the results of a single case study.

## Method

## Case presentation

B. is a 15-year old Caucasian male diagnosed with ASD. The diagnosis was based on psychiatric assessments, neuropsychological assessments, and the developmental and medical history of the patient. According to the Dutch version of the WISC-III, B. has an above average IQ of 116 (V-IQ 115; P-IQ 113). His neuro-cognitive profile was characterized by a well-developed perception of detail, an

impaired processing speed, and lower than average work pace in the case of complex tasks. Cognitive flexibility was average, but lower than can be expected based on his IQ. B.'s parents are divorced. Alternately he lives with either his mother or father. B. has two siblings of which one has been diagnosed with ASD and showed depression-related symptoms.

At the time of diagnosis, B. was not able to adequately share his thoughts and express his feelings. He experienced potentially unpleasant and stressful thoughts and feelings as inexplicable somatic complaints such as fatigue, nausea, and headaches, without being able to link these to his state of mind. These complaints typically increased during school activities and decreased or even disappeared on weekends and holidays. Because of this fluctuating pattern, B. did not meet the strict criteria for a mood or anxiety disorder. In addition to these symptoms, B. was extremely passive. Without the encouragement of his parents, B. did not spontaneously engage in daily life and social activities. Except for ASD and comorbid mood and anxiety symptoms, B. did not suffer from any other psychiatric disorder or trauma.

B.'s treatment history consisted of psycho-education and psycho-motoric therapy that focused on improving social interactions, expressing one's emotions, and recognizing bodily signals. For the physically experienced symptoms, B. was prescribed Fluoxetine, which seemed to have a small effect. Fluoxetine was prescribed several months before the start of EMDR treatment and used on a stable dosage during EMDR treatment.

## EMDR treatment

Treatment consists of 10 weekly EMDR sessions of 60 minutes and targeted stressful daily life events rather than traumatic images from the past. Stressful daily life events included arguing with family members, having dinner at a restaurant, and going to school. Apart from a two-week interruption between session 6 and 7, EMDR sessions were scheduled weekly. For each session, a standardized

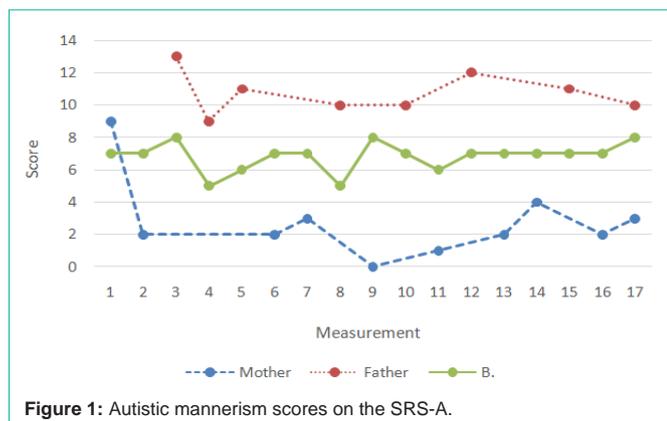


Figure 1: Autistic mannerism scores on the SRS-A.

EMDR protocol was used that consisted of the following consecutive steps:

- 1) Determining and visualizing a confusing and/or stressful daily life event that occurred during the past week (e.g. a situation that caused anger, fear or confusion)
- 2) Formulating a negative and a positive thought based on the chosen event
- 3) Determining the amount of stress that is evoked by the chosen event
- 4) Patient focuses on the chosen event while being presented with a distracting stimulus
- 5) Evaluating the amount of stress that is caused by the chosen event
- 6) Linking positive thoughts to the negative one when the stress caused by the chosen event does no longer exist
- 7) Evaluation and closure of session.

Stages 4 and 5 are repeated until the chosen event induces little to no stress.

## Measures

The change in autism symptoms was assessed with the Social Responsiveness Scale (SRS-A) [7] and the Autism Diagnostic Observation Schedule 2 (ADOS-2) [8]. The SRS-A consists of 65 items related to:

- 1) Social Awareness
- 2) Social Cognition
- 3) Social Communication
- 4) Social Motivation and
- 5) Autistic Mannerisms

The items were answered on a 4-point scale ranging from never true to almost always true. In total, the SRS-A was administered 17 times. Both B. and his parents completed the SRS-A prior to (measurement 1 to 5), during (measurement 6 to 16), and after treatment (measurement 17). B.'s scores on the SRS-A were considered the primary outcome measure of this study. The ADOS-2, a semi-structured observation schedule that assesses social, communicative,

stereotyped and play behavior, was administered prior to and after treatment by a trained clinician.

## Results

### Autism symptoms

Overall, total scores of neither the SRS-A nor the ADOS-2 showed a decrease in autism symptoms.

A substantial reduction of rigidity and repetitiveness symptoms was, however, observed in the SRS-A scores of both parents (Figure 1). B. himself did not report any changes in rigidity and repetitiveness symptoms on the SRS-A.

### Qualitative analysis

At the end of treatment (10 EMDR sessions) B.'s parents reported that he was more willing to attend school and participate in school activities. In addition, B. required less encouragement to engage in activities related to personal hygiene, leisure, and household chores. B. also seemed to be much more at ease and cheerful during social events. Finally, B. was more willing to share his thoughts and feelings, and expressed less physical complaints. Overall, it seemed that B. experienced less stress.

Surprisingly, B. himself did not notice any significant changes in stress levels or behavior. He did, however, mention that recalling the stressful situations discussed during treatment felt less unpleasant.

## Discussion

The current study aimed to explore whether EMDR can reduce the core symptoms of ASD. As suggested by both the qualitative and quantitative results, it seems that EMDR mainly affects rigidity and repetitiveness symptoms and improves quality of life (e.g. school performance, self-care, etc.). In support of these findings, recent research suggests that ritualized behaviors such as rigidity and repetitiveness are triggered by stress (e.g. [9]), which is likely to further impede an individual's functioning and result in even more rigid behavior. Considering that high stress levels are common in ASD (e.g. [10,11]) and EMDR is a thoroughly proven treatment of (trauma induced) stress-related disorders [12], it seems that the effect of EMDR on rigidity and repetitiveness symptoms is mediated by stress reduction. Since EMDR might increase functional connectivity [6], stress reduction may in turn result from improved information processing. Given the fact that there is no treatment that specifically targets and significantly reduces rigid and repetitive behaviors in youngsters diagnosed with ASD, the results of this study are particularly notable and encouraging.

The reduction in rigid and repetitive behaviors was noticed by B.'s parents, but not by B. himself, which is not surprising. Due to limitations in formulating thoughts about feelings and emotions [13], individuals diagnosed with ASD have trouble to identify and report experienced symptoms [1]. Hence, although the use of self-report questionnaires to study the core symptoms of ASD is quite common, it may not be the most appropriate way to investigate the effect of EMDR on autism. Future research should, therefore, use parent-reported measures, or reports of spouses in case of adults, as primary outcomes. Although the current study did account for parent-reported measures, a constraint of these measures was that they were completed by both parents alternately. Because the SRS-A scores

of B.'s father were systematically higher than those of B.'s mother we were unable to use all measuring times and with that conduct a proper statistical analysis.

When rigorously designed, single case studies can be particularly useful experimental designs in a variety of situations, such as limited resources, low incidence rates, or the examination of novel and expensive interventions [15]. As such, we would encourage future research to perform multiple single case studies, in order to provide in-depth statistical insights on the effect of EMDR on the core symptoms of autism. In line with this recommendation, we are currently conducting a larger single-case design study on this topic.

## Acknowledgement

This research was funded by MIND, the Netherlands.

## References

- Happé F, Frith U. The weak coherence account: detail-focused cognitive style in autism spectrum disorders. *J Autism Dev Disord*. 2006; 36: 5-25.
- Dijkhuis RR, Ziermans TB, Van Rijn S, Staal WG, Swaab H. Self-regulation and quality of life in high-functioning young adults with autism. *Autism*. 2016; 21: 1-11.
- Shapiro F. Eye movement desensitization: a new treatment for post-traumatic stress disorder. *J Behav Ther Exp Psychiatry*. 1989; 20: 211-217.
- Chen L, Zhang G, Hu M, Liang X. Eye movement desensitization and reprocessing versus cognitive-behavioral therapy for adult posttraumatic stress disorder: systematic review and meta-analysis. *J Nerv Ment Dis*. 2015; 203: 443-451.
- Kana RK, Libero LE, Moore MS. Disrupted cortical connectivity theory as an explanatory model for autism spectrum disorders. *Phys Life Rev*. 2011; 8: 410-437.
- Pagani M, Di Lorenzo G, Verardo AR, Nicolais G, Monaco L, Lauretti G, et al. Neurobiological correlates of EMDR monitoring—an EEG study. *PLoS one*. 2012.
- Roeyers H, Thys M, Druart C, De Schryver M, Schittekatte M. Screenings lijst voor autism spectrum stoornissen: Handleiding. Hogrefe. 2011.
- Bildt A, Greaves-Lord K, De Jonge M. ADOS-2 Nederlandse bewerking. Hogrefe. 2013.
- Rodgers J, Glod M, Connolly B, McConachie H. The relationship between anxiety and repetitive behaviours in autism spectrum disorder. *J Autism Dev Disord*. 2012; 42: 2404-2409.
- Corbett BA, Simon D. Adolescence, stress and cortisol in autism spectrum disorders. *OA Autism*. 2014; 1: 2.
- South M, Rodgers J. Sensory, emotional and cognitive contributions to anxiety in autism spectrum disorders. *Front Hum Neurosci*. 2017; 11: 20.
- McGuire TM, Lee CW, Drummond PD. Potential of eye movement desensitization and reprocessing therapy in the treatment of post-traumatic stress disorder. *Psychol Res Behav Manag*. 2014; 7: 273-283.
- Mitchell P, O'Keefe K. Brief report: do individuals with autism spectrum disorder think they know their own minds? *J Autism Dev Disord*. 2008; 38: 1591-1597.
- Bishop SL, Seltzer MM. Self-Reported Autism Symptoms in Adults with Autism Spectrum Disorders. *J Autism Dev Disord*. 2012; 42: 2354-2363.
- Lobo MA, Moeyaert M, Cunha AB, Babik I. Single-Case Design, Analysis, and Quality Assessment for Intervention Research. *J Neurol Phys Ther*. 2017; 41: 187-197.