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Applying EMDR on children with PTSD

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■ **Abstract** *Objective* To find out child-adjusted protocol for eye movement desensitization and reprocessing (EMDR). *Method* Child-adjusted modification were made in the original adult-based protocol, and within-session measurements, when EMDR was used in a randomized controlled trial (RCT) on thirty-three 6–16-year-old children with post-traumatic stress disorder (PTSD). *Results* EMDR was applicable after certain modifications adjusted to the age and developmental level of the child. The average treatment effect

size was largest on re-experiencing, and smallest on hyperarousal scale. The age of the child yielded no significant effects on the dependent variables in the study. *Conclusions* A child-adjusted protocol for EMDR is suggested after being applied in a RCT for PTSD among traumatized and psychosocially exposed children.

■ **Key words** child – EMDR – PTSD – trauma

Introduction

Eye movement desensitization and reprocessing (EMDR) is a treatment method originally developed by Francine Shapiro to treat traumatic memories in adults with post-traumatic stress disorder (PTSD) [14]. A recent meta-analytic study showed that trauma-focused cognitive-behavioral therapy (CBT) and EMDR tend to be equally efficacious for the treatment of PTSD in adults [13].

Despite the prevalence of childhood trauma, studies regarding psychotherapy for children suffering from PTSD are scarce [1]. In spite of the difficulties in applying evidence-based methods in the diagnoses and treatment of childhood PTSD, several studies have been published on the effect of pharmacotherapy and psychological interventions for the treatment of childhood PTSD [4, 5, 8, 11, 12].

The works of Greenwald, Lovett and Tinker were pioneering in introducing the EMDR treatment for

children [6, 7, 15]. They demonstrate valuable aspects of EMDR applications in child psychotherapy. However to our knowledge no evidence-based study on their EMDR applications has been published. Regarding the use of EMDR in treatment of childhood PTSD, clinical studies have been published showing positive effect of the EMDR [10], while the first controlled trials have been applied by using the current protocol [3]. Difficulties in applying a child-focused treatment protocol might be one of the obstacles.

This paper describes a special protocol for EMDR used in treatment of children with PTSD in a randomized controlled trial (RCT) [3].

Method

■ Subjects

At a child psychiatric outpatient clinic for investigation and treatment of traumatized and psychosocially

exposed children, a total number of 33 children aged 6–16 years (20 girls and 13 boys) were treated by EMDR for a PTSD diagnosis according to DSM-IV criteria. The children had been referred from social welfare, childcare centers, school health care, pediatric hospital, and child and adolescent psychiatry. The referred child had experienced at least one traumatic event, and grown up in at least one of the following psychosocially exposed conditions: Criminality, chronic illness, substance abuse, handicap, or physically or mentally unavailable parent.

The inclusion criteria were: child age of at least 6 years and showing no manifest mental retardation. All who fulfilled the criteria for the study agreed together with a custodial adult to participate in the study. Subjects were excluded if they needed other types of treatment (such as medication, cognitive therapy or play therapy), or having received social welfare service during the study time.

■ Instruments

The diagnostic interview for children and adolescence (DICA) [3]

According to the DSM-IV criteria, the DICA has been developed for identification of PTSD diagnoses and psychiatric co-morbidity. A Swedish version was used in structured interviews with the child and/or its caregiver [9].

The post-traumatic stress symptom scale for children (PTSS-C scale) [2]

The PTSS-C scale was administered in semi-structured interviews with the child to estimate the study outcome. The caregiver was present and commented the interview only on demand of the child.

The PTSS-C scale has been developed to diagnose PTSD according to the DSM criteria, to identify post-traumatic stress symptoms non-specific for PTSD and to assess severity of post-traumatic stress symptoms among children. It consists of 36 items. The first four items are related to the definition of traumatic event, and the remaining 32 items are included in the symptom score estimation. Fifteen items address PTSD-non-related stress symptoms, and seventeen items address PTSD-related symptoms fulfilling criteria of PTSD. The PTSD-related symptom scale consists of three subscales; re-experiencing traumatic events (five items), avoidance of reminders (seven items) and hyperarousal (five items).

To each question there are five response alternatives related to severity of the symptom; 0 = No, 1 = A little, 2 = Some, 3 = Much, 4 = Most. Ranges

for total scores of the re-experiencing, avoidance and hyperarousal subscales are: 0–20, 0–28 and 0–20, respectively. A total PTSD-related score is calculated by summarizing the scores for three subscales ranging from 0 to 68, and for PTSD-non-related score from 0 to 60. Thus, the range of total post-traumatic stress score is 0 to 128. The PTSS-C has shown acceptable psychometric properties.

Treatment session measures [14]

The severity of “negative emotion” was determined by asking the patient to estimate her/his feelings on a 0–10 scale (“0” = “Not at all”, “10” = “All the time” or “Very much”), defined as *subjective units of distress (SUD)*.

The *validity of the positive cognition (VOC)* was estimated by asking the patient to determine the validity on a 0–7 scale (“0” = “Not at all”, “7” = “All the time” or “Very much”).

When the child was unable to measure according to the scaling mentioned above, the scale was modified to adjust to the child’s age and developmental level. Young children usually measured adequately when the scale was modified to “not at all—little—often—all the time” instead. Within-session measurements are included in the EMDR protocol that together with the child-adjusted modifications are described elsewhere [3].

■ Procedure

After being investigated by a large battery of instruments, children who fulfilled the criteria of the study were invited to participate in the study. The informed consent was obtained verbally from the child and her/his caregiver. The ethics committee of the College of Medicine, Uppsala University in Sweden approved of the study. The child was randomized to treatment (8 weekly EMDR sessions) or a waitlist (waiting for 8 weeks before starting the same treatment) for the purpose of controlled trial.

The participating children were also randomized to one of the EMDR therapists at the center. The two therapists had completed both level-I and level-II EMDR education. They had a long experience of working with children, as a child psychiatrist and a clinical psychologist specialized in children.

The participating children were scheduled for pre-test assessment (Test 1) conducted directly after randomization and post-test assessment two months later (Test 2). Children in the treatment group received EMDR immediately after Test 1, while those in the waitlist group had to wait two months before receiving the same treatment after Test 2.

Table 1 The original adult-focused EMDR protocol and the child-adjusted modifications

Original adult-focused EMDR protocol	Child-adjusted modifications
1. The first session starts with informing the patient about the treatment procedure, the technique used and the possible benefit and side effects	1. If the child demands, the caregiver can attend but without commenting the session. The child is asked to confirm that she/he understands the information given by the therapist
2. A relaxation technique is used to assist the patient getting relaxed	2. The relaxation technique is adjusted to the child's age and the surrounding circumstances during the session
3. The patient is asked to tell the most enjoyed memory. This is considered as "safe place"	3. The therapist assists the child by asking questions that make the child describe the contents of a chosen enjoyed memory in details. This is considered as "safe place"
4. By following the therapist's finger moving horizontally 10–12 times in front of the eyes of the patient, the patient is asked to keep thinking of that pleasant event which is called "safe place"	4. The child is asked if she/he could think of the memory while following the fingers with her/his eyes. If not, the eye movements are replaced by tapping on hands or thighs or by clicking with fingers in front of the child's ears
5. The patient is inquired to recall a most terrifying memory. This is considered as the traumatic event	5. Whatever the child reports is to be registered as a traumatic memory, even if it seems banal for the therapist
6. The patient is encouraged to find out the most relevant negative emotion when thinking of the traumatic event and where in her/his body it is mostly felt	6. Ask the child what she/he is feeling while relating the traumatic event. If difficulties arise, face-pictures expressing various emotions are shown to the child to point out the most relevant feeling
7. To determine the severity of the negative emotion, the patient is asked to estimate the subjective units of distress (SUD) on a scale ranging between "0" and "10", where "0" means "not at all" and "10" means "all the time" or "very much"	7. The adult scaling form of the SUD is attempted first. If the child is unable to record with numbers, the scaling has to be adjusted to the child's age by pointing out on a line from the least to the maximum. For small children, a ranging of "not at all—little—often—all the time" might be more applicable
8. The patient is asked about trauma-related thoughts. This is considered as "negative cognition"	8. The face-pictures are used whenever the child has difficulties in estimating thoughts and emotion
9. The patient is asked about what she/he wants to think instead. This is called "positive cognition"	9. Whenever the child shows difficulties in finding out alternative cognition, ask about how it could be instead
10. The validity of the positive cognition (VOC) is estimated by the patient determining how true it is between "0" and "7", where "0" means "not at all" and "7" means "all the time" or "very much"	10. The estimation of the VOC has to be attempted first in the same way as for the adults. If it does not succeed, modifications have to be applied according to the estimation of the SUD for children as described in 7
11. The patient is asked to recall the traumatic memory together with the negative emotion and the negative cognition while following the therapist's finger through the same movements as before	11. The EMDR processing is performed in similar way as in the installation of the "safe place", while encouraging the child to remain thinking of the negative emotion and the negative cognition associated to the traumatic memory
12. After every 10–12 finger movements, the patient is asked to take a deep breath, to think free, and to talk about what is coming up	12. The relaxation after each EMDR is to be accomplished as it is described for the "safe place", while letting the child freely associate by telling what she/he wants to tell
13. Same procedure is repeated until the patient reports no further comment	13. The EMDR processing is repeated until the child has nothing more to report
14. Then, both the SUD and the VOC are re-assessed	14. Then, the traumatic memory is recalled again, and the SUD and the VOC are re-estimated
15. The procedure is repeated until the SUD diminishes to "0", and the VOC increases to "7"	15. The child is asked to repeat the procedure until satisfactory results are obtained on the SUD and VOC
16. Before leaving the session, the "safe place" is installed again as in the beginning	16. The "safe place" is re-installed as at the beginning of the session

The two therapists administered the investigations and randomization procedure, while an independent evaluator conducted the pre- and post-test assessments. The independent evaluator was unaware of the treatment conditions.

An EMDR treatment plan was established consisting of eight weekly sessions of maximal 45 min each. The two therapists agreed on a specific EMDR protocol to be applied in the study. The child-adjusted modifications of the EMDR protocol are presented in relation to the original adult-focused protocol (Table 1).

All the steps taken during an EMDR session were documented for analysis at the end of the therapy. The first session was used mainly to inform the child

and the caregiver about the therapy, and the last session was for closure of the therapy.

■ Statistics

χ^2 -test and *t*-test were used to examine group differences. All through the study, a significance level of 0.05 was used.

Results

All of the participating children attended at least one EMDR session. However, only 21 (63.6%) completed

Table 2 Demographic variables distributed on the number of completed EMDR sessions ($N = 33$)

Number of children		Number of EMDR sessions							
		8	7	6	5	4	3	2	1
Total, n (%):	33	21 (63.6)	2 (6.1)	1 (3.0)	1 (3.0)	5 (15.2)	1 (3.0)	1 (3.0)	1 (3.0)
Gender, n (%):									
Girls	20 (60.6)	13 (65.0)	1 (5.0)	1 (5.0)	1 (5.0)	2 (10.0)	1 (5.0)	0	1 (5.0)
Boys	13 (39.4)	8 (61.5)	1 (7.7)	0	0	3 (23.1)	0	1 (7.7)	0
Ethnicity, n (%):									
Swedish	19 (57.6)	13 (68.4)	0	1 (5.3)	0	4 (21.1)	1 (5.3)	0	0
Others	14 (42.4)	8 (57.1)	2 (14.3)	0	1 (7.1)	1 (7.1)	0	1 (7.1)	1 (7.1)
Birth country, n (%):									
Sweden	25 (75.8)	14 (56.0)	2 (8.0)	1 (4.0)	1 (4.0)	5 (20.0)	1 (4.0)	1 (4.0)	0
European	5 (15.2)	4 (80.0)	0	0	0	0	0	0	1 (20.0)
Other	3 (9.1)	3 (100)	0	0	0	0	0	0	0
Family, n (%):									
Single parent	28 (69.7)	18 (78.3)	1 (4.3)	1 (4.3)	1 (4.3)	4 (17.4)	1 (4.3)	1 (4.3)	1 (4.3)
Both parents	1 (3.0)	1 (100)	0	0	0	0	0	0	0
Foster care	4 (12.1)	2 (18.2)	1 (9.1)	0	0	1 (9.1)	0	0	0
Parent with, n (%):									
Criminality	9 (27.3)	7 (77.8)	0	0	0	2 (22.2)	0	0	0
Alcoholism	7 (21.2)	5 (71.4)	0	0	0	2 (28.6)	0	0	0
Somatic disease	10 (30.3)	4 (40.0)	1 (10.0)	0	1 (10.0)	4 (40.0)	0	0	0
Psychiatric disease	20 (60.6)	14 (70.0)	0	1 (5.0)	1 (5.0)	3 (15.0)	1 (5.0)	0	0
PTSD	20 (60.0)	12 (60.0)	1 (5.0)	1 (5.0)	1 (5.0)	3 (15.0)	1 (5.0)	1 (5.0)	0
Co-morbidity with PTSD, n (%):									
MDD	15 (45.5)	10 (66.7)	0	0	1 (6.7)	2 (13.3)	1 (6.7)	1 (6.7)	0
CD	11 (33.3)	6 (54.5)	1 (9.1)	1 (9.1)	0	2 (18.2)	1 (9.1)	0	0
ADHD	10 (30.3)	7 (70.0)	0	0	0	1 (10.0)	1 (10.0)	1 (10.0)	0
SA	6 (18.2)	5 (83.3)	0	0	0	1 (16.7)	0	0	0
GAD	1 (3.0)	1 (100)	0	0	0	0	0	0	0
ASD	1 (3.0)	0	0	0	0	1 (100)	0	0	0
>1 diagnose	13 (39.4)	9 (69.2)	0	0	0	2 (15.4)	1 (7.7)	1 (7.7)	0
Type of trauma, n (%):									
Maltreatment	12 (34.4)	9 (75.0)	0	0	1 (3.0)	0	1 (3.0)	1 (3.0)	0
Sexual abuse	7 (21.2)	5 (71.4)	0	0	0	2 (28.6)	0	0	0
Witness to UD	5 (15.2)	4 (80.0)	0	0	0	1 (20.0)	0	0	0
Accident	5 (15.2)	2 (40.0)	0	0	0	2 (40.0)	0	0	1 (20.0)
War experience	1 (3.0)	1 (100)	0	0	0	0	0	0	0
Forced isolation	1 (3.0)	1 (100)	0	0	0	0	0	0	0
Others	2 (6.1)	1 (50.0)	0	1 (50.0)	0	0	0	0	0

ADHD = Attention deficit and hyperactivity disorder, ASD = Autism spectrum disorder, CD = Conduct disorder, EMDR = Eye movement desensitization and reprocessing, GAD = General anxiety disorder, MDD = Major depression disorder, PTSD = Posttraumatic stress disorder, SA = Separation anxiety, UD = Unnatural death

all the eight session. Although all the children came from psychosocially exposed conditions, no positive association was found between the number of sessions and any of the variables in the demographic data (Table 2).

The average treatment effect size on the total PTSS scores, PTSD-related, PTSD-non-related, re-experiencing, avoidance and hyperarousal scales was 0.16, 0.22, 0.06, 0.40, 0.21, and -0.01 , respectively, indicating that the re-experiencing symptoms were mostly improved by EMDR treatment.

The deviations from the adult-focused protocol were mainly related to the age and developmental level of the child. Among other things there were some difficulties to make the small children (age < 6 years) capable of ranging the negative emotions, SUD, why we had to arrange the ranging in four steps, "not at all, little, often,

all the time". The small children (age < 6 years) also had some difficulties in describing what she/he wanted to think regarding the negative cognition. They rather described how it ought to be instead. Thus, the original steps were applied first, and whenever the child seemed unable to follow the instructions, the modified steps were applied according to the child-adjusted protocol (Table 1).

Most of the demographic variables in Table 1 were found in children who completed all the eight EMDR sessions, except for having accident as the most terrifying event, and a parent with somatic disease. These two conditions might have prevented children from completing all the eight sessions. Neither the children nor the caregivers reported the applied protocol as a cause for interrupting the therapeutic contact. The children became rather interested just

because of the modified measurement. The main deviance from the adult EMDR protocol concerned the identification of the positive cognitions. Children had difficulties in identifying and measuring the alternative thoughts to their negative cognitions associated to the traumatic events. However, only in a few cases was this step totally omitted. However, the ranging “not at all—little—often—all the time” was used instead of the adult-focused “0–7” scale when the VOC was assessed for the young children. In spite of these modifications, the age of the child yielded no significant effects on the dependent variables.

All through the study, it was easier for the children to find the “safe place” than the traumatic events. No difficulties were found as to assisting the children in making accurate scaling of their feelings by the SUD, or the positive cognitions validity with the VOC. However, nearly always, the child needed assistance to explain the negative feelings, the negative cognitions and to make differentiations between them.

Discussion

In order to find a single technique for application of EMDR protocol on children, two psychotherapists with EMDR competence and different disciplines agreed on a child-specific modification of the original adult-focused EMDR protocol. As the ability to identify positive and negative cognitions and emotions concerns the development of the child, the child-adjusted modifications were based on the child’s age and developmental level. The applicability of the child-adjusted protocol was analyzed after treating childhood PTSD in a RCT on 33 traumatized and psychosocially exposed children. No relationship was found between the number of EMDR sessions completed by the children and the recognized variables regarding demographic data, co-morbidity with the PTSD, and the type of most terrifying experience of the child. However, several deviations were found in relation to the components and the technique of the EMDR. The deviations from the adult-focused EMDR protocol were mainly found in the moments of recalling the traumatic events, identification of negative cognitions and emotions, and

mostly regarding the identification of the alternative positive cognitions.

Using the EMDR for children offers a possibility to explore the child’s thoughts and feelings. The EMDR might be an effective pedagogic technique to teach the child how to identify her/his thoughts and feelings in specific situations, and to differentiate the negative and positive correlates to them. Identifying positive alternatives to the negative cognitions and emotions in relation to specific situations such as a traumatic experience leads us to think of the paradigm of cognitive psychotherapy. Although the mechanism of action of the EMDR is still unknown, the similarity of the structured EMDR technique and its components to the principles of cognitive psychotherapy is striking. The cognitive character of the EMDR makes it suitable for child applications as various cognitive therapeutic techniques do. Furthermore, the findings that only one single EMDR session is satisfactory for treatment of PTSD in children (e.g. [8]) support the similarity of the mechanism of action of the EMDR with that of the cognitive psychotherapy.

One possible reason behind the children interrupting the planned eight EMDR sessions might be that a parent having a somatic disease was unable to follow the child to complete all sessions. Children who attended less than eight sessions often reported accident as the most terrifying event. Clinical experience reports traumatic accidents to respond well to a minimum number of EMDR sessions. However, this has to be proved and further explained in more rigorous research.

In spite of the limited sample size and the non-homogenous characteristics of the subjects, this study illustrates the possibility of adjusting a well-structured adult-based treatment technique to child conditions when the approach considers the age and the developmental level of the child. Further evaluations of this child-adjusted protocol have to be conducted before being able to generalize its applicability to the largely variable child conditions.

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