

Memory Editing with Emphasizing the Role of EM in EMDR

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ABSTRACT

Eye Movement Desensitization and Reprocessing (EMDR) process encompasses several nervous system components such as medulla, pons, midbrain, cerebellum, basal ganglia, parietal, frontal and occipital lobes. The role of Eye Movement (EM) has been documented previously in relation with cognitive processing mechanisms. By EMDR we can reach some parts of memory which were inaccessible before and also emotionally intolerable. EM also decreases the memory's image clarity and the accompanying excitement and it is done simultaneously for gaining patient's attention to an external stimulus when he/she is concentrating on a certain internal subject. A series of systemic experiments have shown that the eyes spontaneous movement is associated with emotional and memory changes and results into decreased excitement, flexibility in attention, memory processing, and enhanced semantic recalling. Researches emphasize on the effectiveness of EMDR in memory changes and memory washing.

Keywords: Memory Editing; Eye Movement; Eye Movement Desensitization and Reprocessing

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INTRODUCTION

Theory

In the years before Shapiro suggested the hypothesis that Eye Movement (EM) has desensitization effects. He also tested it on others and found a similar effect. Later he added other elements on this intervention which involved cognitive components and developed a therapy method called as EM Desensitization (EMD). Then he developed a case study and also a controlled study¹ to examine the effectiveness of EMD in patients. Shapiro continued to develop his therapy method. He changed the name of his method into "EM desensitization and reprocessing" (EMDR) to reflect the cognitive and attitudinal changes associated with illness which occurs during the treatment². Then, this method was trained to mental health specialists. This method involves attention, memory and emotion. Despite of EMDR's effectiveness in well controlled studies, like most of new approaches in neurocognitive therapy. This method is still the topic

of many discussions and disagreements³.

The therapeutic effects of EMDR

The researchers' adaptive information processing model is an information processing theory for defining and anticipation of the therapeutic effects of EMDR⁷. In here a simplified model of this theory is presented. The memories are stored in networks which consist of thoughts, images, emotions, and related emotions. These networks are adaptively associated with each other. The learning occurs when the new concepts parallels with the previously stored material⁴⁻⁷. All human beings have an information processing system which is comparable with other body's systems for instance digestion system. The information processing system processes the multiple elements of our experiences and stores the memories in an accessible and useful way⁸. When a negative or traumatic event occurs, the information processing maybe done imperfectly and the reason could be the

negative emotions or emotional dissociation interference with the process of information. This causes that new information not to make a probable connection with the more adaptive information which is stored in memory networks⁹. When the individual is thinking about the trauma, or even when the memory is triggered by similar situations or clues, the individual could experience the events which have happened on that specific incident again or have emotional excitement and strong physical sensation. It is not only the major traumatic events that result into psychological, sometimes it is possible that a minor trauma, for instance a parent's abuse or being mocked by classmates, may lead into misprocessing¹⁰. This minor trauma may lead into personality problems and become the basis of present dysfunctional reactions¹¹. EMDR can be helpful for clinical relief from agonizing memories complains by reprocessing the components. This could involve major or minor traumatic memories. The information processing is done by making adaptive connection between previous memories and traumatic ones¹. During these treatments, memory washing occurs and new experience with the associated emotion is stored in the individual's memory and prepare him/her for the proper reaction in the future situation.

Role of EM in EMDR

The role of EM in EMDR has been already recorded in related with cognitive process mechanisms and memory changes. A collection of systematic experiments has revealed that the eye's spontaneous movement is associated with cognitional changes and unpleasant emotions^{12,13}. The EM with the therapist's guide is the most common dual attention stimulant used, but there many other forms of stimulants like hand-tapping and auditory stimulation can be used in this therapy method³. The EM was defined as dual attention stimuli which convey the process which during it the patient concentrates on both internal and external stimuli.

The EM is used to draw the patient's attention to an external stimulant while the patient is simultaneously concentrating on the internal agonizing topic¹⁴. The studies showed the EM causes a decrease in arousal, flexibility in attention and memory processing, and improvement of semantic recalling¹⁵. In other studies it has been noticed that the EM decreases the vividness of the memory images, also the accompanying arousal. The eye, in order to focus voluntarily and also fixating the object, storing vivid images from moving object, and focusing on near or far objects, needs complete coordination of muscles and also 3 sets of intraocular

muscles (ciliary muscles, dilators, and iris sphincters)¹⁶. The neural mechanisms which direct these functions are in medulla, pons, mid brain, cerebellum, basal ganglia, and parietal, frontal, and occipital lobes.

The precise binocular vision is reached by coordinated ocular muscles function that allows a visual stimulus that is on the similar parts of two retinas. The simultaneous and symmetrical movements of the eye are called conjugate movement or gaze¹⁶. The movement of the eyes simultaneously in opposite directions to each other which happens in convergence with the eyes is called disconjugate. These two natural types of EM are called versional vergence. The movement of the eyes in horizontal axis could be saccadic or in form of slow pursuing movements. The aim of saccadic movements is rapid changing of visual fixation in order to bring new images of objects on the fovea. The saccadic movement can be made by asking the patient during the examination¹⁷. Command saccades are slower pursuing EM and its aim is to store clear and stable image from a moving object.

The brain circuits for soft/slow pursuit movement are less known. One of the circuits is probably rooted from posterior parietal cortex, adjacent temporal and anterior occipital cortex and descends into dorsolateral pons core on the other side. Also some papillae from frontal eye field and dorsolateral pons core on the other side are having a hand in it. Papillae from focus and cerebellum dorsal vermis have role in it^{18,19}. In addition to the routes mentioned above, during the EMDR, the sensual circuits are involved from the optical nerve to optic chiasm after formation of optical tract through optic radiation which moves towards the occipital cortex. In order to preserve the proper tone of pupil and adjusting the entering light, the afferent visual routes from retina toward pretectal cores of mid brain and constricting routes of pupil from mid brain towards the retina are involved.

Dual attention stimulation can cause the provoking of orienting response and this process is important for memory changes¹⁹. The orienting response is a natural response consisting of attention and interest which is activated when the attention is given to the new stimulants. There three concepts for orienting response in EMDR: cognitive information, neurobiological and behavioral changes. These changes are not specified and watch a single phenomenon from different points of view¹⁸. The researchers believed that orienting in EMDR is an investigatory reflex which leads into a relaxing response (basic relaxation), after it is determined that no threats exist, this relaxation through reciprocal

inhibition leads into therapeutic result²⁰. Some believe that orienting response can disassemble the traumatic segment of the memory network and cut the previous concepts and in return allows the new information to be organized and formed in a new compatible shape. In addition it is plausible that the orienting response induce neurobiological mechanisms which simplify the activation of episodic memories and mixing them in cortical semantic memory²¹. In a study, the orienting response was evaluated. They showed that the orienting response increases attentional flexibility²². There are various studies showing that the EM and other stimulants are effective on perception of the subject memory, decrease on vividness of the image and its accompanying emotion. Some has posed a hypothesis that the effect of EM queer the working memory and by a decrease in vividness lowers the volume of the accompanying emotion. This group also suggests that this effect can take part in treatment like” a supplementary response for imaginary exposure”²³. Some others have proposed the hypothesis that EMS decreases the somatic perception along the recalling and this leads into decrease of excitation and results into decrease of vividness²⁰. They have proposed the theory that this effect allows the patient to access some parts of his/her memory which was inaccessible before and the patient could not bear its excitation.

This explanation has found similarities between EMDR and reciprocal inhibition. The physiological basis of ENDR like other psychotherapies is unknown. Thus, all presented neurobiological changes for the effect theoretical aspects. The testing of the hypotheses of neurological mechanisms of EMDR needs development of advanced brain imagery techniques. In a study performed PET studies on PTSD patients and while they were encountered with precise and clear narrations of their traumatic memories²⁴. The patients had only shown increased activity in right hemisphere of the brain, in regions that had the most shares of emotional arousal, and the increase in the right visual cortex activity which reflected the reported flashbacks in patients. The Broca’s area, a part of left hemisphere of the brain that has the responsibility of interpreting the personal experience into communicable language, had shown the least activity. In 6 patients, the SPECT were performed prior and after the EMDR (each had received 3 sessions of treatment). An increase in activity was noticed in bilateral anterior cingulate. This region brings closer the experience of real threat to the perceived threat. This shows that the patients experience less arousal after EMDR. Another important finding of this study was that the metabolism in

pre-frontal lobe will increase after the treatment²⁵. Some of the independent researchers have provided evidence in support of this theory. They have shown that EM to left and right sporadically, facilitates the performance of episodic recalling memory. They had not found such effect on semantic memory²⁶. So they obtained evidences for episodic new recalling memory with EMDR. It can help to memory changes for memory editing and memory washing.

Technique of EMDR

EMDR is a therapy method with eight phases for processing of information^{7,12}. Diagnosis phase (1st phase): The first phase in EDMR treatment is taking an initial history during which the therapist evaluates the client and designs a treatment plan²⁷. The therapist and client both consider the probable aims of treatment which consists of agonizing events and the present situation that causes emotional distress. The related his-torical events and development of the skills in specific behaviors will be needed in future situations.

Assessment phase (2nd to 4th phase): In the second phase, the therapist assesses the client’s skills and preparation for confrontation with stress and emotional distress²⁷. In this phase, the well-formed coping skills and stabilized condition of client should be assured of. If necessary, at first, it must concentrate on learning the new skills. These skills include relaxation and coping skills. The third phase, assessment, consists of the assessment of target memory in which the client is asked to focus on the most vivid image or thought related to the memory (if available), a negative opinion towards him/herself, and emotional and physical sensation with concomitant measurements^{13,23}. The client does identify a positive opinion against the negative opinion she/he has, and determines the amount of credibility that she/he holds for these opinions. For instance, the traumatic memory of a car accident can be accompanied by the negative opinion of “It was my fault” and the opposite positive opinion could be “I have done what I could” and “It was not my fault”. In the desensitization phase, the fourth phase, the therapist asks the client to hold the target image, negative thought, and the unpleasant physical emotions while simultaneously following the therapist’s hand movement direction (bilateral stimulation) with his/her eyes and following it for 20 to 30 seconds. Depending on the need a longer duration may be required²⁵.

Treatment phase (5th to 7th phase): In the fifth and sixth phases, installation and body scan are performed and worked on by using the EMDR method. Although

the eye movement is the most common used external stimulus, the therapist also uses other stimuli like auditory sense, tapping, and various forms of tactile stimulation. The type of dual attention and the required time for each subsequent set is determined on the basis of the therapist's needs¹⁹. The client is asked to think only on what is happening. After that the therapist demands the client to empty his/her mind and pay attention to any thoughts, emotions, images, memories, or physical emotions which she/he perceives. Based on the information presented by the client, the therapist determines the subject that should be worked on for the next step of treatment. In most cases, a client-centered association process is persuaded and it is repeated during the treatment session. If the client feels discomfort, the therapist uses some methods to help the client to continue the information processing. When the therapist is unable to reach the target memory, she/he would ask the client to pay attention to a positive thought identified by the client or a better thought existing in mind. Concentrating on the incident while simultaneously making eye movements should be done after that⁹. Following several sets, the client reports an increased confidence on the positive thought. The client will be asked about the existence of physical emotions and if any negative emotions exist, that would be processed just like above. If positive emotions exist they would be amplified. In the seventh phase, the therapist asks the client to make a list from any events that aroused the client and made him/her to use self-calming techniques (which is taught in the second phase).

Re-evaluation phase (8th phase): The next session is started with the eighth phase which consists of re-evaluation of previous works and the progress rate in comparison with the previous session. The EMDR can be used in processing of all related past events, the present distressing events, and future scenarios which need different answers. The main objective is to make the most profound and most comprehensive treatment in the least time possible. After the EMDR process, clients mostly report that the related emotional distress with the memory is reduced to a large extent and they have received an important cognitive insight on this context²⁸. These cognitive and emotional changes mostly lead into simultaneous personal and behavioral changes which will become better with EMDR standard methods.

CONCLUSION

Various studies show the stability of the EMDR effects during the time. A study of gradual studies of therapeutic effects of EMDR is showing that one complete course of

treatment (in comparison with limited treatments) could be insufficient for the complete improvement of disorder. The studies which are made on the efficacy of EMDR on memory changes. Although these results could be due to methodological limitations in various studies, it is also possible that EMDR would not be an appropriate method for memory editing and washing. Since the EMDR is a treatment for agonizing memories, probably it is effective in treatment of memory disorders secondary to a traumatic experience²⁹. There are case reports and case series of treatment of other medical disorder by EMDR. Cases include dissociative disorder, memory changes, body deformity disorders, pain disorder, personality disorders, phantom limb pain, and drug dependency disorders. These findings primitive and need more work before any conclusions are achieved.

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